

BULLETIN  
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C. R. Worth, Editor

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### A GARDEN OF CATCH-FLIES

ARTHUR R. KRUCKEBERG, *Seattle, Washington*

A VAST AND unwieldy genus is *Silene*, liberally stocked with worthless perennials of lank habit and minuscule flowers, not to mention the multitudes of nomadic and drab annuals. But here and there in the stretches of catch-fly wastelands are gems that give *Silene* status as a rock garden inhabitant. So, in these two opening sentences, I dare to paraphrase Reginald Farrar—and in meaning, justified. Farrar would go on to toss out pontifications about this and that species until his worshipful readers would come up with a dozen or so species that they might use in Farrar's domain of rock and shard.

But when you "go soft" on a clan, as I have, then it is so much harder to be critical—to relegate to the compost heap the less than perfect rock garden plant. For the past ten years, I have been collecting silenes and their nearest of kin in such genera as *Lychnis*, *Melandrium*, *Petrocoptis*, and *Heliosperma*. At first, there was no thought as to the garden value of any of my motley assemblage. I was simply trying to poke away at the problem of how the many patterns in *Silene* evolved and how the species might be related one to another. Collections of living plants—first from North America, then from other lands—were subjected to the kinds of research uses that keep a botanist busily and happily engaged for years on end. I counted chromosomes, made hybrids and asked the hybrids whether they were fertile or not. The answers they gave have at times been cryptic, but by now I know something of the family relationships of most species in the United States.

All such cloistered study would tell a plantsman blessed little about what was best among our American silenes for rock gardens. Yet, amassing a collection of natives for such esoteric botanical pursuits has been far from irrelevant, in a gardening sense. My wife, whose critical eye would permit only the most tasteful combination of plant textures and habits in our garden, has suffered to see silene after silene brought home for trial—only to flunk the test of esthetic appeal. However, in the last year or so, I have been able to please her more often with my cast-offs from the research greenhouse. Of the western silenes, she will take all the *Silene californica*, *hookeri*, and *petersonii* I can bring home. We are particularly fond of the soft red form of *californica* from the Trinity River country in northern California. And the low mounds of gray foliage that

cushion the masses of shell pink flowers of *hookeri*—especially from Jackson and Josephine counties in Oregon—are ever tantalizing. Would that we could make them last in our garden!

Our greatest gardening successes have been with the eastern U. S. species and some of the hybrids they have spawned in response to my ministrations of a stranger's pollen. Clearly, the *Silene caroliniana* alliance is outstanding—and usually available in the various seed exchanges. Typical *caroliniana* is a tight-rosetted plant with longish, strap-shaped leaves and a glandular inflorescence, bearing many soft pale pink to white flowers. You would find it to be rather common in the sandy soils of the coastal plains and piedmont of the Carolinas and northern Georgia. It flowers like mad for us in the wet Northwest from April to June. Other named forms of *caroliniana* are comparable in stature and flowering habits. *S. caroliniana* subsp. *pensylvanica* is simply a non-glandular form of the typical *caroliniana*. Look for it in dry sunny habitats from upper North Carolina and southern Virginia all the way to New Hampshire, and west to Tennessee. The third variation on the *caroliniana* theme is subspecies *wherryi*, the westernmost outlier of the group. With somewhat broader leaves and fine pink flowers, *wherryi* makes the boldest front of the three. It has long been a favorite among rock gardeners. My plants came from Harold Epstein—his a deep pink, and Mrs. J. N. Henry—hers a paler pink.

Red silenes from the United States are few in number and even fewer pass the size-texture-shape test for the rock garden. Most of them are tall, rank things that do best scrambling through dryish shrubbery for support and sanctuary. In this class we will have to put the rampant *Silene laciniata*, at home elbowing its way up through the twigs of chaparral in cismontane southern California. But its inland counterpart, currently called subspecies *greggii*, has an entirely different ecology, preferring the rock outcrops and grassy openings in the pine forests of the southwest—all the way from Arizona to Texas and south into the Valley of Mexico. I would have high hopes for *greggii* in the more arid rock garden site; there it should hold to a conservative stature and still yield those lovely fringed and lacerated firecracker-red flowers. The specific epithet, *laciniata*, is just what is needed to describe its petals, each one of which seems "pinked" out uniquely by divine shears.

Nature erred when she put the big red stars of *Silene regia* and *S. subciliata* on bean poles! At least she might have dwarfed all but the flowers. Both of these are rare enough to be collectors' items and real novelties for the wild garden. Yet they would need physical, if not moral support for their heavy trusses of big crimson flowers waving atop three-foot stems. *S. regia* occurs in a vanishing habitat—the prairie and open woodland—from the central states of Missouri and Illinois, southeast to northern Georgia. Only one or two of the collectors that I have induced to look for regal *regia* have found it. Ernest J. Palmer of Webb City, Missouri, has had the most luck in his home state. Glen Winterringer, botanist of the Illinois State Museum at Springfield, also sent me seed of *regia*. His account of getting the seed tells a much too frequent story of vanishing Americans: "As you know this species of *Silene* is one of the rare ones in Illinois. The plant from which these seeds came grew in Lawrenceville, Lawrence County, Illinois. It was transplanted from a roadside station about five miles northeast of town to a garden. When we visited the original locality of the plants there was no sign and the roadside had just been mowed." An Illinoisian compatriot, Robert A. Evers of the State Natural History Survey at Urbana, was not so lucky as to even find it. He answered my plea for *S. regia* (and *S. nivea*) by saying, "How correct you are in saying they are elusive. So far in my twelve years of field work I have not found them."



Photographs by Still Photo Unit, University of Washington

Hybrid silenes: above, *S. baldwinii* x *S. caroliniana*; below, *S. caroliniana wherryi* x *S. virginica*.





*Silene caroliniana* x *S. rotundifolia*

If *Silene regia* is rare, then its Gulf Coast counterpart, *S. subciliata* has all but vanished. I owe my only collection of this tall, but elegantly flowered, fire pink to Caroline Dormon of Saline, Louisiana. In 1957 she assured me of a share in this treasure, accompanying her offer with these comments, "Yes, I have grown the *Silene subciliata* for years, but the rabbits have almost destroyed them. They (the rabbits!) are on the increase, and I fear we will soon be in Australia's plight. Happily, however, this past August, I rediscovered it in the same locality where I first found it, and the *only* place I have ever seen it. It is in the western edge of Louisiana. I must hurry back and get seeds before they dehisce..." A month later two plants arrived. "I am 'sparing' you two roots of my *Silene subciliata*, for I have not been able to get back to the collecting site. I want you to have it, for it has the most spectacular flowers of any species I have seen—the purest red. When it puts up in spring, 'pinch back', so you will get more flowering stems. Its only fault is it is too tall and slender." Miss Dormon asked me to try breeding that ranginess out of *subciliata*. No hope in sight yet; the tall stature stays with any interspecific hybrid and as they are sterile, selection for low stature is out.

The real fire pink is, of course, *Silene virginica*. That a westerner should attempt to eulogize the long time favorite of eastern gardeners is presumption to which I will not yield... almost. To be sure, it is larger in every way than



*Silene baldwinii* x *S. virginica*

any of the *caroliniana* clan. But for that superb red, you must 'buy' a little more herbage. Certainly not the tall wands of *regia*, it may go to 15 inches or slightly higher. Just read Farrer's description and you can understand why it is grown despite chances of failure. Here in Seattle we have seen it flower in the deep loamy sand of the Hitchcock garden where a charred stump acts as its foil.

If redness and middling low stature is kinship, then *Silene rotundifolia* must, as Sampson Clay avers, join *virginica* in a family portrait. Breeding tests say different. The hybrids between the two—made both ways—are sterile 'mules'. *Rotundifolia*, a viscid, weak-stemmed, almost trailing version of the fire pink, is nearly as elusive to the collector as are *regia* and *subciliata*. It occurs sparingly along the Appalachian plateau on rocky banks and open cliffs. My sole collection came from the 'Chimneys'—a gorge of Pocket Creek—in the Whitwell Pocket area of southern Tennessee. If one can overlook the rather loose and floppy herbage, then the largish, soft red petals radiating from the fuzzy-glandular, grey-green calyx will cast their own charm.

I have a weakness for two white catchflies of eastern North America. True, they are tall and wand-like in habit, but their masses of starry blooms are compensation enough for me. One of the two, *S. stellata*, is the only *Silene* known to me with whorls of four leaves at a node . . . reminiscent of the rangier eastern *Eupatoriums*. *Stellata* is fairly common from Texas east to the Atlantic seaboard and on northward to New York—I have plants from Staten Island, no



The white  
stars of  
*Silene*  
*ovata*.

less! *S. ovata*, on the other hand, must be classed as one of the real "elusives". Ben Smith at Raleigh, North Carolina, followed all the "leads" at his disposal before he encountered *ovata*—and then only one plant. It is doing beautifully in our research greenhouse, has set copious seed and its progeny are on the increase. Its white stars, though reminiscent of the flowers of *stellata*, exert their stamens eccentrically, such that they are massed at one edge of the corolla—just so some nocturnal insect can easily bedaub itself with pollen. The largish, ovate leaves of this rare southeasterner are in pairs, sparingly disposed along the long wiry stems. Both *stellata* and *ovata* are much too large for the rockery. But do not overlook their value in the wild garden or the perennial border. They would surely give demure charm to a summer's floral display.

If Fred C. Galle, of the Ida Cason Gardens in Chipley, Georgia, were reading this, he would surely ask: "But no mention of *Silene baldwinii*\*?" I would rejoice that I am saving the *best* for last. Close to *caroliniana* in its prostrate habit, it surpasses them all in flower! Huge rose-pink blooms that almost mask the smallish spoon-shaped foliage would be distinction enough. But their showiness is grandly enhanced by the intricate fringing at the tips of the broadly wedge-shaped petals. The botanist would describe this remarkable filigree work in such terms as these: "Blade flabellate, conspicuously fimbriate, margins ciliate". The total effect in looking down on a mass of *baldwinii* flowers is that of a symmetrical mosaic of pink stars, each ray of which is sculpted into an intricate

\*The name "*baldwinii*", as applied by Nuttall must give way to the binomial, *S. poly-petala* (Walt.) Fern. & Schub.



lacework. When I finally found that Mr. Galle was nearly the only living soul who was growing *baldwinii*, and, as well, was successfully propagating it, I begged him for plants. He generously provided them and wrote as follows about the source of his garden culture. "According to Dr. Wilbur Duncan, of the Botany Department of the University of Georgia, *Silene baldwinii* had only been found in one location in the state. From his old herbarium notes, I started a search for the plant. The plants were located in Talbot County on a steep, wooded hillside overlooking the Flint River, north of the county bridge about 75 yards. I only found one colony of plants but was led to believe that the plant was fairly abundant in this area." This species may well become another vanishing American—at least in the wild state. Should any of my readers ever find a colony, spare it the fate of well-intentioned but selfish extermination! The species propagates readily by shoot cutting and by seed. So be content with less than "the whole cloth".

How many silenes in a garden make a surfeit? For some of you, the above melange may be more than enough. For others approaching the extremity of my weakness for catchflies, champions and pinks, your appetite may never be satiated. The garden virtues of many more North American species could be extolled, and to these, a burgeoning list of Eurasian species appended. But I will leave the appetites of the eager minority unrequited for now.

I want to turn now to some of the unusual hybrids that have been borne of my meddling into the private lives of silenes over the years. Of the thousands of crosses made (mostly of academic interest only), I can compile a list of two dozen or so that can be bragged about. And limiting myself to hybrids of eastern United States species only, I come up with the following tally:

Hybrid	Habit	Flowers
<i>baldwinii</i> X <i>caroliniana</i>	compact	pale pink to white-tinged pink; fringed petals
<i>baldwinii</i> X <i>car. wherryi</i>	compact	pink; fringed petals
<i>baldwinii</i> X <i>rotundifolia</i>	spreading	pale red; fringed petals
<i>baldwinii</i> X <i>virginiana</i>	low, erect	pale red; fringed petals
<i>caroliniana</i> X <i>car. wherryi</i>	compact	pink
<i>caroliniana</i> X <i>rotundifolia</i>	spreading	pink to pale red
<i>caroliniana</i> X <i>virginica</i>	low, erect	shades of red to pink
<i>car. wherryi</i> X <i>virginica</i>	low, erect	shades of red to pink
<i>rotundifolia</i> X <i>virginica</i>	spreading	a soft, pale red

All but one group of these hybrid combinations are sterile. The sterile hybrids, though stabilized by their reproduction dilemma, can be perpetuated readily by vegetative propagation. The fertile exception, the *caroliniana* group crossed with *virginica*, has been produced in the past, both spontaneously and with intent. When I wrote the Rex Pearce Seed Company in New Jersey for details on the source of their *wherryi-virginica* hybrids (their "Avalon hybrids"), the terse post-card reply was: "Bees"! With later selfed and backcross progeny, I have recovered, in some degree, various combinations of the parental flower color and habit.

Forced objectivity compels me to admit that some of these hybrids are curiosities that do not achieve the merit of their parents. Yet they do add variety to the array of silenes in the specialist's collection. But, not being wholly submissive to modesty, I must sing the praises of the crosses of *baldwinii* with *caroliniana* and with the two red species, *rotundifolia* and *virginica*. They are superb!

Proof? Well, here is a testimonial from a lady who had a ten-day free trial. Of the *baldwinii* hybrids, Caroline Dorman says: "I know you would like a report on the silenes you kindly sent me. Well, it is unbelievable! They are the *toughest* silenes I have ever tried. In our hot climate, all of them have a strong tendency to damp off, even *S. virginica*. The only one not susceptible is *S. stellata*. *Wherryi* is a beauty, but I cannot keep it. Where can I get *baldwinii*? It must have deeply fringed flowers for those (hybrids) of yours that bloomed were wonderfully fringed and lacerated. Back to yours, I had a broken hip and was away from home three months, and September of that time was very dry. I lost only ONE plant, and that was because a mole ran under and aerated it. This winter we have had snow, and freeze after freeze, but these silenes did not even flinch. I made a few cuttings when they came, and even these poorly rooted plants came through. You simply MUST introduce these wonderful rock garden plants to horticulture." And in a later eulogy, she writes: "I shall be happy to have you quote me as saying they are the most beautiful rock garden plants I have seen. And MOST adaptable. Remember, you sent mine with flowers and buds, yet they lived through our hot summer, with almost no care. Mine are growing among rocks, in gritty soil, but with humus too. They get morning sun—until about one o'clock. But in the north, I presume they would like full sun. I know that rock gardeners will welcome these lovely things. Last year I had blooms on *baldwinii* X *caroliniana*, and they were white or delicate pink. Now there are blooms on *baldwinii* X *virginica*, and they are a beautiful coral rose. Other plants are full of buds, and I can scarcely wait for them to open."

And so, as the author and creator basks in the warm rays of such praise, the editor cries: "Enough!"

## SUCCESS WITH BIRDSFOOT VIOLETS

CAROLINE DORMAN, *Saline, La.*

THE LOVELY faces of *Viola pedata* looking up from among rocks are unsurpassed for beauty, but how to coax them to thrive in the rock garden? My soil is sand, acid and entirely lacking in minerals. When I brought in plants they bloomed generously the first spring, sparingly the second, then no more. I loved them too much to murder them thus, so gave them up.

At last I found a rocky clay hillside with big clumps of birdsfoot violets, covered with bloom. But I *had* seen them growing in sand! I began investigating and found that this sand had an understratum of rock. So I dug out my poor acid sand, brought in clay soil full of brown iron rocks, and prepared a home for my beloved violets. After planting, they were given a mulch of pine needles. Not one has died, and after several years they are slowly multiplying.

I have now collected plants from three similar sites, and in all three there are fascinating variations in the size, color and form of the flowers. There are many bicolors, and in one of the latter black-violet covers most of the flower. Many of the flowers are very large, with one measuring almost two inches in length. Three times in my life I have found a plant with flowers of pure white—but these are rare jewels indeed!

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*You can still sign up for the charter flight to the Third International Rock Garden Plant Conference. Don't miss the opportunity of a lifetime!*

## THE BUSH SALESMAN

Laura Jezik, *Seattle, Wash.*

AMONG THE LESS publicized virtues of rock gardening is its development of sales resistance, and of the determination to follow one's own path, be it right or be it wrong.

Someone there is who, after a violent encounter, does not love the alpine nut. He came upon me unawares and found me at a disadvantage. I was outdoors in the garden shovelling away cubic yards of native clay, to be replaced by soils suitable for my belled primroses. He proposed to draw up a plan of our lot and to sell me nursery stock with which to landscape it.

I told him that he had come to the wrong person; that I am among those who worship at the shrine of the alpine and the woodland flowers; that the gentian, the primula, the rhododendron, the species flora are to my taste.

He told me that I needn't worry about all that, that our home was in a very prominent position and that I must landscape it very carefully because it could be viewed from all directions.

Now, I am well aware that our corner lot is visible. Too, I will be the first to admit that gentians lack a little something as landscape material. You can't do with a primula what you can with a box, but "one man's privet hedge is another man's poison ivy", I always say. I informed him that I was intending to leave things as they were.

He started drawing up his blueprint and I had to let him, inasmuch as I hadn't a pitchfork handy, but I told him that under no circumstances was I going to buy anything from him unless I really wanted it, and I was fairly certain that I wouldn't need any plant material in the foreseeable future. After he had drawn to his heart's content and had walked all over the garden, he left, saying that he would be back that evening.

I told him that I had just that minute made plans for the evening and that he should forget to come back at all. I dodged him for three days, but he found me at home on the fourth.

As he unfolded his plan and started to tell me what he had in store for me I stared in abject horror. He began by explaining to me about "bushes". "Most people buy the first bush they see", he said. "They don't know how many kinds of bushes there are until I tell them. Why, you can get bushes with pink flowers, and some with white flowers, and even—"

"Do tell", said I. "I'm sorry, but I haven't time to listen any longer".

"—some with blue flowers. Did you know that all the bushes don't bloom in the spring?"

I decided that it would be the better part of wisdom not to rise to that bait, and resigned myself to a period of listening in pained silence till he could be ejected.

When he had finished his discourse on "bushes and beauty trees" (which term includes all trees that bloom, be they apple or dogwood or laburnum), he drew forth a sales voucher on which he had listed one hundred and twenty dollars' worth of "bushes" and trees for me to buy.

He next proceeded to tear apart my garden piece by piece, attacking first a little area in full shade. Here I have a soil which I manufactured by the sweat of my brow. It is made of about equal parts of leafmold, peat, sand, rotten wood from the woods, and a forest loam. This section of my garden has been enhanced, I think, by the placement of some very arty rotten logs. Here I have successfully grown *Primula nutans*, *P. saxatilis*, and *P. yargonensis*. *Menziesia*

*lasiophylla* is happy, along with *Sanguinaria canadensis* fl. pl. Cyclamen abound in little pockets in one of my pet logs. Rhododendrons with carpets of *Anemone nemorosa* are there along with some collected *Trillium ovatum* and what I believe to be *Anemone deltoidea*, which was collected from the area around Bumping Lake in the mountains west of Yakima. Under my *Rhododendron* 'Elizabeth' is the dear little oak fern which remains very dwarf for me, as do most of these plants for some undetermined reason. On another log is a small *Gaultheria humifusa* which is learning to drape itself to my satisfaction. Here too I have two *Hepatica triloba*: one, from a friend, grows about ten inches tall and is a pretty blue; the other, bought from a local nurseryman, is much smaller in all its parts except the blossom, which is a large and luminous lavender blue. This is not over four inches in height and is my favorite of the two. Under a seedling skimmia I have a little colony of pipsissewa or prince's pine which came from the Bumping Lake area, and in another little pocket I have the dwarf maidenhair fern that Carl English grows.

Now my bush man doesn't like this spot at all. He thinks that all these plants should be replaced by two 'Pinocchio' roses and a golden acuba—the roses, because they are mildew resistant (and presumably like to live in the shade beside a rotten log), and the acuba, because it is big.

"Nobody can see that little bush from the street", said he, pointing to my *menziesia*.

"It is staying where it is", I said.

"It is too small to be seen", he continued, undaunted.

"So be it", said I, in that final tone for which I am becoming famous.

He moved a little to the east of this where my half-shady rockery commences. This I had built to my own specifications, and was very happy with it until I read some of the English books on the subject. Now I know that it would never please a stratified-rock purist, but it is there and too big to be thrown away.

The rocks here stand shoulder high to me and offer planting pockets in varying degrees of sun and shade. Again, the soil is imported, as is every cubic inch of usable soil in my garden. A pathway of flattish stones leads up over the largest rocks to the east side of the house. In a deep pocket on the top of the largest rock is a white azalea under which I am establishing a sheet of *Linnaea borealis*, which I am inducing to grow over the north face of the rock and to hang down its north face in a curtain. Below this curtain is a *Rhododendron* 'May Day', with a nicely increasing cover of *Cornus canadensis* beneath it. The *linnaea* and the *cornus* are from I have forgotten where (they are found anywhere on the western side of the Cascade Mountains, as well as here and there on the eastern slope of the range).

Farther over is *Epipactis gigantea*. This adorable orchid has a long story. The parent plant was collected in southern Washington by a neighbor, when he was a boy. His mother grew it for years, but when she sold her house she gave a piece to my neighbor's wife, who in turn gave me a start which is now getting nicely established. In one of the tight crevices between the huge rocks of the lower section I have established a moss, and under it run the long licorice roots of *Polypodium vulgare*. This was captured while creeping up a bigleaf maple tree in a friend's woods, but it seems to grow anywhere in our damp Washington forests.

Other tenants of this part of the rockery are erythroniums (purchased), rhododendrons (various dwarf), *Primula edgeworthii*, *Cypripedium pubescens*, *Houstonia caerulea* between some stepping stones, a *Cassiope mertensiana* and

a *Phyllodoce empetriformis*, with *Asplenium trichomanes* filling a sunnier niche.

"We're going to put a *Jasminum nudiflorum* where that weed is on that rock," beamed my advisor, obviously pleased with his ability to pronounce Latin.

"That 'weed', as you call it, is *Gentiana macauleyi*, Wells' variety," I began, but was interrupted with

"The jasmine will cover up all those ugly big rocks (the least you could do is scrape the moss off them)," he said in a confidential tone of voice. Looking a little to the east, he accused me: "I'll bet you never considered putting a bank-binder there to cover up that rocky bank."

For once, I couldn't think of an answer.

"Tell me, have you ever considered a bankbinder?" he was insisting.

He was right. I certainly haven't considered a bankbinder. Instead I had considered and then planted lewisias: *L. tweedyi*, *L. columbiana*, and *L. cotyledon* seedlings (all purchased). Here are the locally found parsley fern, *Cryptogramma acrostichoides*, a few deer ferns from my mother's woods in Kistap County, and *Polystichum lonchitis* from the Mt. Baker National Forest region. Another native here is *Lutkea pectinata*, which I found in a clump of cassiope, and it is the only one of its ilk that I am trying in some shade. It is not in as attractive condition as its sisters that receive more sun. At its best it is a bright green mat that reminds one a little of a fine mossy saxifrage.

Non-natives in this section include *Lithospermum diffusum* 'Grace Ward' and 'Heavenly Blue', daphnes, ramondas, *Saxifraga cuneifolia*, some snowdrops and chionodoxas, more erythroniums, with some *Primula frondosa* and *Iris gracilipes alba* (and, horrors!, *multipetala*—I like it, but what would Kingdon Ward say?), and a white *Anemone blanda*.

"Before I plant a bankbinder there, I will plant a concrete slab."

"That wouldn't be a bad second choice," he said.

Still farther along, he came to a cool but fully sunny region and found my limestone scree, which I built according to the specifications of English authority. The clay was discarded to a depth of three feet, but owing to the severity of the slope, the bottom of the excavation was level with the lawn below the rockery. Because of this there is no possibility for excess water to remain in the scree at all. I can control moisture to some extent by varying the soils in which certain plants are put, making it more sandy for the dry-land plants and peatier for the more moisture loving ones. The scree is not fully completed nor planted, but I do have androsaces, some campanulas (*CC. fenestrellata* and *aucheri* among them), *Primula marginata* and an alpine auricula, *Gentiana acaulis*, *Wahlenbergia tasmanica*, *Scabiosa alpina* and its seedlings, *Globularia nana*, *Tulipa saxatilis*, which refuses to bloom but spreads satisfactorily, various dianthus, saxifrages (encrusted and one Kabschia). I have a very poor washy pink specimen of *Armeria caespitosa* and a lovely *Aethionema* 'Warley Rose', alpine poppies and other little folk of screedom. I enjoy one characteristic of my scree, its tendency to produce surprises. Things appear there that I haven't planted, and some of them appeal so much that I keep them and spend hours trying to figure out what they are.

"That topsoil is so thin it couldn't grow potatoes," he said with a sneer as he looked at an exposed cross section of this scree where I had been excavating and transplanting.

"He's right there," I thought.

"The only thing you can do with this gravel is to plant a smoke tree. They don't mind bad conditions."

I have heard of several 'smoke trees', so I asked him for the Latin name of the one to which he referred.

"It has a Latin name all right," he said, "but everyone calls it a 'smoke tree' because it looks like one."

"Well, bully for it!" I thought.

"And under it we will put purple creeping phlox to cover the gravel, and down there below the rockery where you have that mess—"

Now he had done it. It takes a lot to get my dander up, but he had succeeded. "That mess, as you call it, is a bog," said I. It is planted with *Kalmia polifolia* and *Ledum groenlandicum* and a little cranberry (*Vaccinium uliginosum*, I believe) from a bog in southern King County. The soil is nearly pure peat from that bog, mixed with a little leafmold and some sand. "That green matty stuff you are wiping your feet on is living sphagnum moss," I told him. He had the good sense to move, much to my surprise. In my bog, I have candelabra primroses and *Primula rosea*, a tiny yellow mimulus from Monte Cristo which I found on a rock in a stream, its feet in the water and its inch high flowers in the sun. Above these is a *Calceolaria* 'John Innes' and a seed-grown *Gentiana calycosa*, but my pride and joy in this bog is my stand of sundews. For some reason, the sundews and I get along fine. I collected but one *Drosera rotundifolia* and now I have dozens. They bloom and apparently seed. Many times I have found a tiny insect rolled up in one of the minute leaves not an inch in height. I have to admit that the sundew isn't showy, but I am going to keep it. I will not replace my bog with the lawn the bush man suggests.

At this point he began to walk around to the front of the house and my hopes of getting rid of him increased. "What are those bushes?" he asked, looking at my heathers.

When I had answered him, he said, "Well, you can keep four of them, but we will fill in the spaces left when we discard the rest with lavender and candytuft and ajuga."

"See the picture of the lavender and iberis," he said to my husband, who had just arrived home. "Isn't the lavender pretty? It is fragrant and grows eighteen inches tall—"

"I know," I interrupted. "I have several plants of it and of the iberis and I must agree that they are lovely in their place, but in a heather bed? What is the matter with the heather you are discarding?"

"Heather takes up too much room and blooms for only a few weeks in the middle of the winter," he explained.

"There are six varieties in bloom right in front of you," I said, "and this is August."

"Joe," he continued, addressing my husband, "you can snip a little piece of lavender every morning and rub it on your lapel."

"Isn't it my good fortune to own so much of it," I interrupted. I was beginning to look upon it and the iberis with a jaundiced eye. Maybe I should discard them for something choice enough to be absent from his catalog.

"They are only a dollar a plant, so I have written you a bill for a dozen each. You certainly should be able to fit that into your budget." His voice showed a little impatience or irritation.

"I don't believe we need discuss these any more," I replied with even greater irritation.

"We will get rid of all those bare rocks there and cover that empty space with ajuga," he proposed, pointing to a non-calcareous scree that I am still working on. In this place I have used a loose silty prairie soil from eastern Washington. The empty spaces that annoyed him so are filled in the spring with *Fritillaria pudica* and *F. lanceolata* collected from east of Cle Elum, where I got

*Sisyrinchium douglasii*. Non-natives that were also invisible to my salesman are *Iris reticulata*, *Crocus longiflorus* and *C. chrysanthus* 'Snow Bunting'. *Anemone fulgens* shows its red in the spring and in another place there is a blue *A. blanda*. In a vertical crevice between two rocks I have put the little pussy paws, *Spraguea multiceps* (*umbellata*) which I collected from the hot white pumice slopes above timberline in the Nelson's Ridge area. Another spot on the rocks is covered by an as yet unidentified dwarf shrub from a rock slide above Bumping Lake, and between two other rocks is a thriving patch of *Lutkea pectinata*. *Raoulia australis* covers its rock and is spreading rapidly—too rapidly. Behind all these is *Mahonia aquifolium* that I keep in the sun, where its leaves remain reddish and where it flowers profusely. Another little shrub here is a pernettya with pink berries.

"We are not going to change that spot," I announced vigorously,

"Joe," he asked, "do you know any way to shut your wife up?"

"I know a good way to shut you up," Joe answered. "What nursery do you represent anyway? We have to be on the lookout for the fly-by-nighter who jumps off a freight train at the city limits and tries to peddle nursery stock from out of state. Where is this stock grown, anyway?"

The salesman mentioned a nursery firm neither my husband nor I recognized. "Of course, we don't grow our stock here, it's too humid." He hurried on, "Now over here I am moving your azaleas."

I staggered. He was pointing to a spot which is so hot that I once killed a thyme there when I forgot to water it. Another time I almost killed one of my cacti, which I sometimes plunge outside there in the summer.

"And now we are coming to the place where you need a few bushes. We will put an abelia right beside your azaleas, because our catalog says they like a hot dry condition, and over there we will have some holly bushes for their greenery, and over there further we will plant some euonymus for their green, and then you need a hypericum bush for its yellow..."

"See that neighbor over there," interrupted Joe. "He just moved into that house and I have been told he is very stupid. Why don't you go over and sell him some bushes before he leaves. He is getting into his car now. You had better hurry."

"... flowers, and then here we will plant a red spiraea bush and a white one over there. You can move that hydrangea bush away from the chimney and let it cascade down the driveway wall."

"That sure is a swell car you have parked by the curve," said Joe. "I bet you get good mileage in it. Let's see you get some now."

"And over..."

"Oh, can you wait a minute more? I just bought a new 30-06 Springfield rifle, and I want to show you how I am going to get my elk this fall," and Joe stepped into the house.

The salesman disappeared into his car, and it disappeared in a cloud of dust. When Joe came back with his gun he found me gazing at the slowly settling dust. Our man was gone. We mourned not his passing.

## BOOKS OFFERED BY THE SOCIETY

The Secretary asks that you be reminded that the Society offers for sale garden books by both American and British publishers at prices often considerably below those for which they can be obtained elsewhere. By ordering your books through the Secretary, you will help both yourself and the Society. Address all queries and orders to Mr. Totten.

## THE YOUNGEST CUTTINGS EVER ROOTED

J. P. ZOLLINGER, *Brooklyn, N. Y.*

IT HAS OFTEN been stressed that alpiners are generally tough creatures able to overcome the severest hardships. This was brought home to me again two years ago when I discovered too late that I had been sold a bag of contaminated peat moss and had used it for the seed starting mixture. Sand and glass jars (I used the glass jar method recommended by our editor, but 'Vancide' fungicide was not available to me) were sterilized in the oven, so there was no doubt that the trouble I ran into had its cause in the peat moss. A week after sowing the micelia of fungi began to weave their gossamer fabric over the surfaces of all jars and a little later pinheadsized fungoid fruiting bodies appeared. A commercial fungicide did not check this growth. Soon I also discovered that the unused part of the peat moss had meanwhile hatched a goodly lot of springtails.

Of about a hundred species sown almost half failed to germinate, probably because the seed embryos were destroyed before germination. Among the species which did germinate a dozen or so damped off no sooner were they up. *Phacelia sericea* (from two different sources), *Dracocephalum grandiflorum*, *Incarvillea grandiflora* and some dwarf delphiniums were among these.

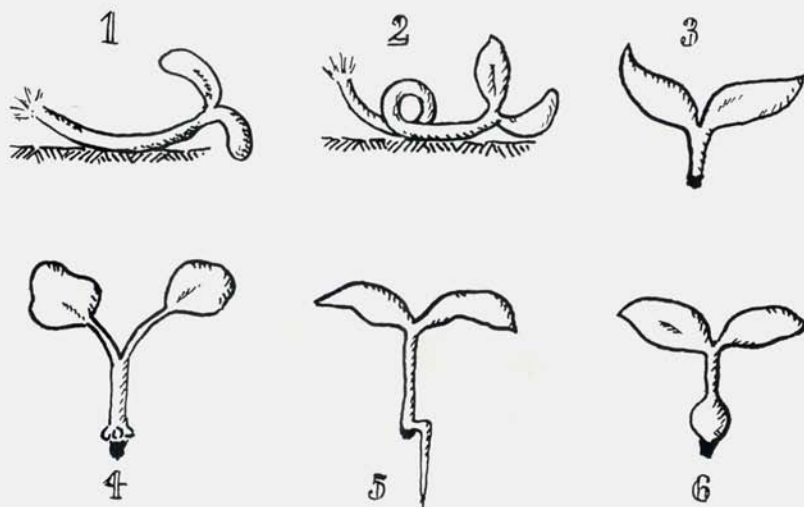
Most intriguing, however, was the behavior of some other species, especially those with very fine seed which had been left uncovered on the surface. These seedlings were strangely reluctant to sink their roots into the peat and sand mixture and kept lying on top like green little crescents, cotyledons as well as stunted rootlets pointing into the air, or, after an attempt to sink the rootlets down, they thought better of it and turned them up again (Figures 1 and 2). They reminded me of certain microscopic animalcules showing the "avoiding reaction" in the face of danger. Surprisingly, these "floaters," if they made no progress, at least persisted for weeks. But when the majority of the other seedlings, even those which seemed normally anchored in the starting mixture, a month or more after germination also showed no inclination to come out of the cotyledon stage, I decided literally to go to the root of the matter.

It so happened that even in this case I had merely used a metaphor; for seedling after seedling which I cautiously pricked with a fine toothpick from a dozen containers came out without roots, merely as stemlets anywhere from one sixteenth to half an inch in length, with a pair of cotyledons on top and always the telltale brown butt at the bottom. The roots had all rotted off (Figure 3). Only in a very few instances did I find the shriveled brownish remnants of a root system still attached to the stems.

After about ten minutes of such disheartening testing I came upon something new. A seedling of *Geranium subcaulescens* three quarters of an inch long showed a whole wreath of translucent root buds around the stem, directly above the brown scar left by the lost original root (Figure 4). Later, in a jar of seedlings of *Erigeron saluginosus*, I found two, one quarter of an inch long, which had put out a bayonet-like radicle from above the point where the original one had been amputated (Figure 5). And finally one seedling of *Gentiana kurroo* one eighth of an inch long showed above the stubby butt scar a bulbous swelling which I hopefully interpreted to be a form of callus presaging new root growth (Figure 6).

At this moment it occurred to me that what I had before me were actually plant CUTTINGS "made" in the cotyledon stage, not by a propagator but





J. P. Zollinger.

Various types of damage displayed by seedlings.

by a parasite. The procedure indicated therefore was to treat my entire crop of crippled seedlings as cuttings, a forlorn-hope sort of cuttings, to be sure, but it would nevertheless be interesting to see how many would fight their way back to a normal life. In the end I did find a few species the seedlings of which had normal roots or only a few cases of root wilt. *Rhexia virginica* proved completely immune to the wilt; *Gentiana parryi*, *G. pneumonanthe* and one batch of *Loiseleuria procumbens* seedlings were very little affected.

All the rootless seedlings were then sterilized (I hoped) by soaking the butt ends in a weak solution of potassium permanganate and then "stuck" like regular cuttings in a mixture of heat-treated sand and freshly procured peat moss. Lack of ventilation under polyethylene or glass covers however tended to encourage further damping off, indicating that the fungi had penetrated many of the young plants. Removal of the covers seemed to be of some value but did not prevent further casualties. Still, it was encouraging to find at a later check-up that many seedlings had formed new roots, even if a good percentage of these wilted off again.

It would be of interest, and perhaps even of some slight scientific value, if I could offer exact statistics of casualties and complete root regenerations. But there are probably few of us in whom calamity would awaken the statistical instinct (if such there be); besides, there were still hundreds of seedlings, and counting has never been among my favorite exercises. A check was kept only on *Gentiana clusii*, in which I was then especially interested and which had germinated profusely. Of 125 seedlings of this species only 38 lived to be potted up individually and 18 of these died soon after potting, giving a regeneration rate of 16%. With other species the rate was, I believe, rather lower, with losses often reaching 100%.

Still, June saw approximately one third of the cold frame space reserved for new seedlings occupied by plastic  $2\frac{1}{4}$  inch pots containing the survivors,

not all in good shape, though. But they did embody the assurance that, if ever the same blight should strike a rare and treasured species in the cotyledon stage, a few of the seedlings could be saved by being treated like cuttings.

In the end I was glad that I had not attempted to conduct this involuntary experiment according to the rules of the laboratory. For there came a day in July, following two cool and cloudy days, when, beset by other trouble, I forgot to open and shade the cold frame in the morning. It turned out to be the hottest day of the summer, and by the time I discovered my neglect, most of the contents of the frame were thoroughly cooked. Some species, however, survived even this catastrophe. *Rhexia virginica*, most seedlings of *Gentiana clusii*, *G. kurroo* and a few *Rhododendron ferrugineum* were unscathed, some others put out new leaves from the roots a week or two later (some freshly rooted normal cuttings of *Epigaea repens* displayed both types of survival). But the great majority of plants were dead for good.

Nor was this the end of the sad tale. In the winter, while for months the cold frame was buried under a heavy cover of frozen snow, mice or voles managed to make themselves at home in that cozy shelter, eating up nearly everything above ground and a good many fleshy roots out of pots. (They also disposed of all the calluna cuttings but merely nipped off a few of the ericas, which later recovered in the spring, whereas the callunas did not).

There is, perhaps, the extenuating circumstance that the marauders belonged to the starved *literati* among rodents—well, literates, anyway. Because seven of the pots, four of *Gentiana kurroo* and three of *G. clusii*, into which the culprits had not dug down, still bore the original labels with the legend “no roots,” which they seem to have taken literally, although it meant of course that at one time these plants had been rootless cuttings made by some parasite. In the spring these put out new growth and by the end of their second summer were among the most healthy looking tenants of the rock garden, even though by then the genuineness of *G. clusii* had become doubtful (the leaves seem too large). At least these seven plants are living proof that cuttings can be made in the cotyledon stage (without furnishing increase, of course), as the whole abortive experiment supports the general rule, especially important in the propagation of difficult evergreens, that the younger the stock plant, the more easily cuttings will root.

Of the four dozen species of seed that failed to come to life the first spring after sowing only two germinated later: *Aquilegia scopulorum* and *Polemonium viscosum*, both from Dr. Worth's 1958 collection. Of four aquilegia seedlings only one has survived. One polemonium seedling appeared in November, nine months after sowing, but, be it as a result of the fungus infection or for other reasons, has remained arrested at a height of half an inch. Eight more *P. viscosum* germinated the second spring after sowing and are now three inches tall.

## CHARTER TRIP TO THE ROCK PLANT CONFERENCE

All members received, some time ago, the announcement that if sufficient members are interested, a plane will be chartered for a trip to the Third International Rock Garden Plant Conference in London and Edinburgh this coming April. The cost will be considerably below that of a regular commercial flight, especially as reduced winter fares will no longer be in effect. Reservations can still be accepted, until the end of January. If you have not yet made up your mind, act now!

## NOTES ON SEEDS OFFERED IN THE EXCHANGE

C. R. WORTH, *Ithaca, N. Y.*

DESPITE THE probability of redundancy (for some remarks may be repeated in an article which will begin in a later number of the *Bulletin*), it seems advisable to comment on some of the species which Jack Furcha and I collected last summer, and which have been sent to the Exchange. On some of the better-known species, habitat notes may be appreciated; on many, neither Farrer nor Clay gives adequate information. Some remain unidentified: at times, satisfactory herbarium material was unobtainable; in other cases, taxonomist friends, working when they can find time in an already overcrowded schedule, have not yet returned verdicts on puzzling specimens brought back from earlier trips.

The hundreds of bags and packets of seed which Jack and I harvested resolved themselves into about 215 apparently distinct species and varieties. Of these, some seventy were in sufficient quantity, and of adequate interest, to send to Mr. Harkness. It may be that, when my exchanges with botanic gardens and private growers are cared for, others can be added to the seed list before it goes to the printer. For one can never predict the demand for a particular species: one year many requests must be denied, and when later a sufficient quantity is available, few persons ask for it; another may be offered several times with little demand, and be deemed undeserving of the effort spent in harvesting it, when suddenly it will become one of the most popular items in the entire list.

The very considerable labor and expense (borne by myself) make these seeds somewhat precious. Some I shall probably never again collect—which means that, unless I can interest someone in carrying on this work, they may not be available again, at least in the reasonably near future. I hope that their recipients will give them the best care and attention they can (and, incidentally, that inexperienced growers will not request the more difficult kinds); and that they will send to the Exchange seeds of the species which they find growable and garden-worthy, so that other gardeners may have the pleasure of trying them.

*Anemone lithophila*, if indeed it is that species, seems not to differ greatly in superficial aspects from *A. globosa*. It is somewhat shorter, well under a foot in height, with inch-wide flowers of pale yellow or dull red-purple, and is an inhabitant of sunny banks of mixed soil and lime rubble. Its charms are modest, and it is of little interest to other than the botanical-minded.

*Aquilegia caerulea*, where I have seen it, is not a woodlander, but a plant of high alpine meadows and the lower parts of coarse stone slides, usually in full sun. Occasionally it grows near the last trees. I have found it on both quartz and volcanic formations, but never on limestone—perhaps only because there has been no limestone available, for its white form, *A. c.* var. *ochroleuca* (which I have not collected in recent years) grows in Utah on lime, in light shade.

*Aquilegia flavescens* is perhaps the least spectacular of the western species, its flowers rather small and with shorter spurs than those of most of the long-spurred group, pale yellow or occasionally pinkish. While it is at home in subalpine meadows, it is most luxuriant when growing on or near partially shaded limestone cliffs where the soil is constantly moist. According to exposure, it varies from a foot to three times that height.

*Aquilegia jonesii* grows in sunny lime scree (very fine) or, in one range, in lime crevices. Two to four inches above its tightly whorled grayish leaflets it carries upward-facing flowers of deep blue or blue-purple, with short spurs. I have (Lynn Ranger please note) grown and flowered it from seed, but even in the wild I have several times come across stands of thousands of plants of which few, or even none, had flowered. I find it hard to keep, shy-flowering,

and a less desirable garden plant than the more accommodating *A. scopulorum*. A small harvest, the result of hours of search, allowed only about two hundred seeds to be sent to the Exchange. It often lies dormant for at least a year before germination.

*Aquilegia scopulorum* var. *calcareae* is a totally different plant from the more familiar type (which had failed to flower last year). It grows on hot slides of brilliant red limestone, apparently always very dry. There it makes fluffy basal tufts, six inches or more across, of light blue leaflets, above which rise almost leafless stems to as much as eighteen inches or two feet. The flowers, of the same size as in its dwarf form, are of a dazzling yet intense deep blue. Seedlings develop slowly (as do those of our other dwarf species), but seem fairly reconciled to high ledges in the rock garden.

*Arnica cordifolia* grows in light woodland, and raises its yellow daisies to as much as eighteen inches. It is not quite a good plant, though handsome.

*Arnica* sp. is more deserving, with smaller leaves and less height, but the same yellow suns. It came from volcanic soil at about 12,000 feet in Colorado. Growing in semi-open woodland it reached ten inches, but on rock slides was little more than half that height. Starvation, once it is growing well, is indicated.

Of eighteen collections of *Astragalus* and *Oxytropis*, it seemed advisable to send only *O. lambertii*, which raises eight-inch racemes of brilliant red-purple flowers above silver leaves, and seems tolerant of a wide variety of conditions (W. R. Adamsen has flowered it at Ossining, from seed I sent him); #23, which made blue-gray prostrate mats a foot or more across, in sunny positions very dry at the time of collection, although I suspect that in normal seasons the moisture is at least moderate; #28, a foot-high species with rather erect leaves, quite attractive, although I have never seen the flowers; and #29, collected by Jack and unseen by me, with long racemes on a plant over a foot in height—as he brought back only a huge harvest of pods, I cannot comment on the foliage, but suspect that it may be a good gamble.

*Calochortus* sp. white grows foot-high in sunny meadows and rarely strays into the alpine zone. I suspect that it is either *C. nuttallii* or *C. gunnisonii*, but (as in many other instances) find Rydberg's descriptions inconclusive.

*Chaenactis douglasii* (*alpina*) is a rather attractive member of an often weedy genus. It is only three or four inches high, with leaves divided almost into lace, usually grayish. Its head is a cluster of inch-long tubes, white with a touch of lavender, somewhat reminiscent of valerian. It is a plant for lovers of the curious rather than the showy. I have found it—or two closely related species—in both lime and granite slides and scree, in full sun, at high altitudes.

Compositae #54 may or may not give pleasure to its owner; I like it. From a rosette of pinnately divided basal leaves it puts up a stem of from six to eighteen inches, usually about twelve, which bears a very loose cluster of yellow-rayed heads two inches across. It is showy, though a trifle coarse, and comes from sunny limestone ledges and soil at about 11,000 feet on a rather dry peak in southern Nevada.

The corydalis sent out as *C. aurea* may well be misnamed, for none of Rydberg's descriptions seems to fit. In the valley of the upper Rio Grande, one of the best-watered regions of Colorado, at nearly 9,000 feet, it grew here and there on roadside cuts and banks. It formed broad mats, two or three feet across and three or four inches high, of a rich dark green, dotted with little golden flowers, and had the appearance of being soundly perennial. It was new to me last year—almost certainly not the taller, less spreading corydalis I collected in Utah many years ago, which until recently flourished in Grace Dowbridge's garden.

*Crassina grandiflora* is first cousin to *Zinnia*, but its flowers look far more like those of a single French marigold, with four or five broad ray-florets of orange-yellow. Many wiry stems are sent up to form a dense little bush six to eight inches high on sunny dry banks. I know it from Arizona and southern New Mexico, but as it ranges into Colorado, it is probably fully hardy.

The Carrot Family is hardly among the leading contenders for a place in the rock garden, yet *Cymopterus* sp. (?) is deserving of a trial there. Its leaves are so finely divided that they are almost skeletonized, and its rather flat umbel is of a brilliant deep yellow. Its only defect is its height, for it seems unable to decide whether to remain at six inches or to stretch to twice as much, when its effect is somewhat lessened. It comes from sunny alpine scree of very fine lime rubble, among the august company of *Aquilegia scopulorum*, *Townsendia montana* and *Silene petersoni*, although it usually prefers slightly richer fare than they do.

*Dodecatheon jeffreyi redolens* forms dense tufts a foot or more across of long rather narrow deep green leaves, and has deceived me into mistaking it for *Primula parryi*, but here the flowers, on foot-high stems, are soft pink. It occurs on limestone, in places that become very dry shortly after the rather scant supply of snow has melted. It is fully hardy in my cold, wind-swept garden.

*Douglasia montana* and its variety *biflora* (originally given specific rank) differ only in that the latter usually has two flowers to a stem, seems confined to alpine elevations on limestone, and has proved much the better and more enduring plant in my garden. The former was collected at a quite low altitude in the Madison valley of Montana, around outcrops of what I recalled as limestone until I found quartz crystals among the seeds. The minute tufts with flowers of rich pink are among the most valuable of the western rock plants, and are fairly tolerant of eastern conditions, although not the easiest plants to keep going.

*Elephantella groenlandica*, with its curious "elephant heads" of rich red-purple, is probably parasitic, and the seeds should be sown directly in a moist sunny place among plants of moderate stature—not more than a foot. I have, however, found it growing among plants that like only moderate moisture, *Phacelia sericea*, *Polemonium confertum*, erigerons and castillejas, so that it may be adaptable to locations other than the semi-bog.

*Erigeron compositus*, in a dwarf form with rich lavender flowers, is to me possibly the most pleasing of its large genus. Such are the forms I have collected, and while the plant takes almost any conditions in the wild, I suggest growing it in crevices or lean scree, so that it will perhaps remain in character.

*E. pinnatisectus* is taller, to eight inches, with skeleton leaves of rather glossy green. The few flowering heads which I have seen have had lavender rays. It seems very scarce, for in each of the three ranges where I have encountered it, it has been confined to a single stand of a few plants. While Walter Kolaga regards it as a real gem and the best of its genus, I still place it second to *E. compositus*. A plant of sunny slides and steep banks, it seems to offer no serious problem in the garden.

*Erigeron* #79, is a desirable, but not outstanding, species of four inches, with violet heads, from sunny alpine meadows in Colorado.

*Erigeron* #80 is quite distinct, with narrow grayish leaves, stems of three to six inches, and rays of either white or rich pink. I tried to collect seeds of the latter only, but cannot guarantee the progeny. It grew near *Aquilegia jonesii*, but where there was a much larger percentage of soil mixed with the lime rubble.

*Erigeron* #82, according to Dr. William Dress, keys out as *E. simplex*, yet has points of difference from all other collections of that species in the Bailey

Hortorium, so that he is still unwilling to give it a name. It is almost certainly the finest alpine species I have ever seen, no more than three inches high, narrow-leaved, with many-rayed heads of the richest violet. While it has not yet flowered in my garden, it seems easy though deliberate in growth. It came from quartz formations, in a range that is normally well watered.

*Eritrichium elongatum* is a plant of (usually) limestone meadows, where it grows in soil rich in rock fragments, in the company of such plants as *Douglasia montana biflora*, *Aquilegia jonesii* (that is, if one is in one of the few places where the columbine grows), dwarf phlox, and minute erigerons. It rarely condescends to appear in scree, and I cannot recall ever having seen it in a crevice. The tufts of half-inch woolly bluish balls are usually two or three inches across, and the flower stems at seed-time are often two inches high, though I suspect that they elongate after flowering. The forget-me-nots, on the few occasions when I have seen them, have been of a pure light blue. There is little likelihood that it will be any easier than *E. nanum*, so that it should be tried by experienced growers only.

*Erythronium parviflorum* it must be, yet the seeds were harvested in woodland, and the stems reached eighteen inches in height. Elsewhere this species seems to favor sunny banks at alpine or subalpine heights, and is but half as tall.

*Heuchera* sp. #102 I can say little about, other than that it made a neat tuft of fair-sized basal leaves, and that the seeding stems were a foot high. It grew on a steep granitic slope in sun or very light shade, at 11,500 feet in Colorado.

*Hymenoxys acaulis* may reach the seed list, for its charms seem so far to be little appreciated. It bears a sizeable yellow daisy (memory, perhaps in error, says an inch and a half across) on a plant that may be no more than two inches high, at most half a foot. It is a high meadow plant, from either lime or granite, and for those who do not sneer at yellow daisies, a sheer delight.

*Mahonia repens* (or should it be *M. aquifolium*, as Rydberg prescribes?) is a delightful thing that runs about under low deciduous trees, usually aspen. It has holly-like leaves, sparingly borne, yellow flowers, and deep blue berries. In the wild it is but three or four inches high and seems indestructible; in my garden it has attained a foot and suffers badly from open winters. I know it chiefly from subalpine elevations in limestone ranges.

*Oenothera caespitosa marginata* grew in light shade, on limestone. Its huge rosettes were gray-silky, and the white flowers seemed to be the largest I have ever seen on forms of this species.

*Oenothera* sp. #134 we came upon in desert sand, near Las Vegas, so it may well be both tender and difficult. It is unlike anything else in the genus that I have seen or heard of—at least in the single dead plant we found. No leaves were left, only a spike eight inches high, densely set with enormous capsules, fully twice the size of those of the preceding species. From the husky root, it appeared to be soundly perennial, a victim of the drought.

#135 is, I believe, a parnassia, although I am unfamiliar with the genus and had assumed it to be a rather modest one. This plant clung to wet limestone rocks, shaded in the afternoon, and grew to considerably more than a foot in height, with fringed white flowers well over an inch across. At first glance I thought they must belong to exquisite *Caltha leptosepala*.

From the usual large collection of penstemons (most of which have been sent to the American Penstemon Society also), I believe the Seed Exchange has received the following, though I am in doubt regarding one or two:

*P. aridus*, a little fellow (+ in.), with smallish but good blue flowers, from sunny gravel banks.

*P. bicolor*, three feet or more, with big stem-clasping leaves and flowers of some purple shade (or yellow as well?) from the gravelly soil of dry washes near Las Vegas—hardly a plant for cold wet gardens.

*P. clutei* is of the same group, but of half the height, with flowers of blended pink and orange. In spite of being restricted in nature to volcanic cinders, in light shade of pines, it seems happy in my garden in ordinary soil on the top of a low wall, and has survived a rough winter without protection. It is a lovely plant, well worth trying.

*P. cyananthus* is a rather tallish but good one, with blue flowers, from sunny lime slopes.

*P. deustus* is a dwarf, rather finely branched shrub—perhaps a foot high—with leaves that are often holly-like, but in this Nevada form more or less elliptic and entire. The flowers are whitish or yellowish, small, usually regarded as unattractive, but the plant has virtue as a foliage shrublet.

*P. eriantherus* grows about six inches tall, with good-sized violet flowers. It came from a south-sloping hillside, where the conditions were similar to those suiting *Douglasia montana*, so that it should be much more amenable to cultivation than most members of the section Aurator to which it belongs—inhabitants of remote and incredibly arid regions of Utah and Nevada.

*P. garrettii* has proved itself growable in gardens, although in nature it confines itself to the lower slopes of large cones built up by hot springs, and rarely strays to the soil in their neighborhood. It reaches a height of two feet, with long spikes of rather large flowers of brilliant blue.

*P. halli* was new to me, yet I had passed within a few feet of it on two previous occasions. It is a true alpine, from around 12,000 feet, and grows (where I found it) on the summits of two only of a group of low knolls of soil and volcanic rock. Although related to such stalwarts as *P. glaber* and *P. unilateralis*, it looks almost exactly, in both plant and seed, like one of the Aurators. The narrow leaves are bluish, sickle-shaped, folded over the midrib. On four inch stems it bears a number of inflated flowers variously described as "mauve" and "mid-blue". I saw only the ripened capsules. Apparently out of cultivation for many years, it is a "novelty" worthy of trial, even by alpinists with slight interest in penstemons.

*P. humilis brevifolius* is a rare form of a rather widely distributed species, and makes a compact tuft of bright green ovate basal leaves about an inch long, with thin stems three or four inches tall thickly set with small flowers of intense azure. I have seen it growing exclusively in crevices of sunny limestone cliffs and ledges at subalpine heights, which suggests that it may be a problem plant; yet Mr. Adamsen has grown it successfully.

*P. linarioides compactifolius* makes small mats of rather grassy leaves (it is actually a minute shrub), with relatively large blue flowers on stems of six inches, a really delightful plant. It grows under pines in open woodland not far from limestone cliffs, so that any guess regarding the pH of the soil is hazardous.

*P. linarioides taosensis* may well be incorrectly named. It put up only a few stems of eight inches, narrow-leaved, topped by a few (probably) blue flowers. It also grew in open woodland, but the soil was, I believe, of volcanic origin.

*P. montanus* belongs to the shrubby section Dasanthera, but is woody only at the base. It is quite variable, and the form offered, while good, is not the best that I have seen. It makes mats two to four inches high of grayish toothed leaves, with enormous widely expanded trumpets of pure lilac to medium blue. I met it once on a granite slide, but elsewhere have found it only on coarse

lime scree. It has not taken kindly to gardens, and offers a worthwhile challenge to the adventurous.

*P. nitidus* is well known, and gorgeous, with wide blue bells. It is growable, but short-lived, and should be given full sun and sharp drainage.

*P. palmeri* is one of the giants of the race, sometimes seven feet tall, more often three or four. It has long racemes of large catalpa-blossom shaped flowers, varying from white (rarely) to rich pink. It favors sunny dry banks, and has not acquired a reputation for amiability in gardens.

*P. pseudospectabilis connatifolius* is close to *P. palmeri*, with the same ardent tastes, and flowers of pink or rose. It seems to have vanished from the locality where it grew in quantity, and we could find only two plants, which were happily perched on the very summit of a six foot high bank of road gravel. Perhaps similar treatment would make it less dissatisfied with the East.

*P. sepalulus* is also tall, but graceful—a small forest of slender three foot stems, very narrow gray leaves, and cool lavender trumpets, a lovely combination. But it favors limestone screes (usually at rather low altitudes), and its height restricts it to a giant's rock garden. It is so beautiful, in a refined way, that it deserves to be experimented with, to see whether it can adapt itself to situations where it will look appropriate.

*P. unilateralis* is rather coarse, with large dark basal leaves, but extremely showy, and apparently easy in gardens. Its three foot spikes are densely set with rather large flowers of shades varying from lavender to blue, and are usually inclined at an angle to the vertical—a habit which has aroused the ire of some gardeners. It grows in meadows, on rather steep slopes, and in the soil or gravel of valleys—anything seems to please it. It is probably the most satisfactory western penstemon for the novice in this genus.

*P. virgatus* (?) was given this name solely because it seemed identical with plants of this species which I had seen some years before in another locality—a risky procedure with the group to which it belongs, especially when not seen in bloom. It is rather slender, two feet or more in height, and the good-sized flowers are blue, if the name is correct.

*P. sp.* #168 belongs to the section *Anularis* (Caeruli) and grows about six inches high, presumably with wide blue bells. It comes from the same locality and conditions as *P. "linarioides taosensis"*, and whichever of several species it may be, belongs to a section in which there are no duds.

*Phacelia sericea* is, according to present taxonomic concepts, a wide-spread and highly variable species. The seed offered came from high-alpine meadows, in volcanic soil. The basal leaves were several inches long, deeply cut, silky, gray-green. The eight to twelve inch stems were topped by densely crowded small flowers of the deepest black-purple, looking far more like a cluster of ageratum heads than like the more familiar annual phacelias. Seed germinates readily, and the plant is not too difficult to flower, but is short lived in the garden—and probably also in the mountains.

*Phlox caespitosa condensata* (?) we could find in but one place in the mountains above Leadville, where it grows in soil tightly packed between rocks, at the base of a north-facing slide of volcanic rock. It makes compact, very short needled cushions that may be a foot across, with flowers that from a few wilted specimens are probably white, about a half inch across. Phlox seed is usually extremely difficult to catch, but for once luck was with us, and an hour or more of desperate search resulted in a harvest of several hundred seeds.

The specimens of *Phlox* #178 which many years ago I deposited in the Chrysler Herbarium of Rutgers University seem never to have been sent to competent authority for identification, and my own efforts, via Rydberg, led to



the conclusion that it is perhaps a high-alpine form of *P. austromontana*, but that guess may be very wide of the mark. It is to me by far the most beautiful of the cushion phlox (though it may be displaced by *P. tumulosa* if ever I am fortunate enough to see flowers on its rock-hard domes), making very tight, short-needled domes, or rarely mats of considerable size, which have the appearance of being frosted. The pure white flowers are extremely long-tubed, three-quarters of an inch across the limb. It comes from high scree (11,000-12,000 feet) of fine limestone rubble or small fragments of yellow tuff. Seeds were collected for the first time in 1959, and germinated well, but its garden behavior is as yet unpredictable. Phlox seeds should be sown as soon as they arrive, and allowed to freeze through the rest of the winter, when they will germinate with the first mild day of spring.

*Physaria* sp. #184 may possibly be *P. brassicoides*, but no *physaria* that I have ever collected seems quite to fit Rydberg's descriptions or key, and Dr. Dress has encountered the same difficulty. This plant has rosettes two or three inches across of incurving bluish leaves, and looks almost exactly like a thin-leaved *echeveria*. Its fruits are twin spheres a quarter inch in diameter, borne profusely on stems of three or four inches. The *physarias* seem to be little known, and are certainly short lived, but otherwise present no serious difficulty in the garden. They are handsome in both foliage and fruit, while the yellow buds are often displayed for a long time before they fully open.

*Physaria didymocarpa* is totally different from #184, making a flat rosette (or cluster of rosettes) of ash-grey leaves, at times the size of a dinner-plate; the yellow flowers are followed by pairs of balloons an inch across, which, alas, are rarely developed in my garden. I have a very slight qualm regarding the application of this name to the seeds offered, for all I found was a mound of papy balloons, beneath which was not the slightest trace of a plant.

*Polemonium confertum* (and *P. viscosum*, if indeed there are two species, for despite Dr. Wherry I sometimes feel that both are parts of a single highly polymorphic aggregate) ranks close to *Aquilegia scopulorum* as my favorite western alpine; in fact it was largely to obtain seed of it that I returned to the Rockies in 1958, after many years' absence. The whorled-leaflet group of *polemoniums* comes as a complete surprise to those who know only the common coplanar-leaflet type represented by *P. caeruleum* and *P. reptans*. The leaves are basal, more or less erect, from two to six inches in length, around which the tiny leaflets are set in whorls. To the non-botanist, the effect is that of a short stem set with tiny leaves. The flower stem, rising just above the leaves, bears a cluster of long-tubed flowers with widely expanded limb, sometimes more than an inch across, varying from light to very dark blue. *P. viscosum*, of which I failed to get seed last year, is smaller in all its parts than the present collection, and is usually a plant of the highest scree, whereas *P. confertum* often grows in alpine meadows. Seed germinates quickly and easily, and it is not particularly difficult to bring a fair percentage of the babies to maturity. But every plant that I have flowered has died shortly after blooming, without developing seed, yet certainly in the mountains they live to considerable age and develop a number of crowns.

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Perhaps *Adenophora stricta* in the Seed list should be qualified with a question mark as it came in from a German Botanic Garden as *A. Forrestii*. However, after assuming from Cowan's account in *George Forrest: Journeys and Plant Introductions* that true *A. Forrestii* is not in cultivation, it was more convincing that the plant keyed out quite well in Bailey's *Garden of Bellflowers* to the Japanese species. It is a strong plant standing upright, not floppy as is

*A. polymorpha.*

*Jurinea alata* is a jolly Composite with strongly winged stems and a host of rosy-pink flowers coming close to *Centaureas* and *Serratulas*, but a plant of shorter stature, about two feet, that can be accommodated in smaller scale gardens. Considerable interest was shown in some local use of its chaffy flower receptacles in dried flower arrangements.

*Delphinium Zalil* is well enough known as the only yellow perennial delphinium commonly seen and I had not intended to grow it. However, at least two species of *Aconitum*, supposedly, turned out to be the delphinium when grown in the Shaded Border. The deeply cut basal leaves with the light sinus spots are rather nice in the border most of the season even though the tall flower spikes are none too showy.

Everything turned out well with the unknown *Salvia Forskahlei* from the Cambridge Botanic Garden. Upon its flowering there appeared a copy of Notes from the Royal Botanic Garden, Edinburgh containing Studies in East Mediterranean Species of *Salvia* by I. C. Hedge. Herein is a full account: where the plant grows (along the south coast of the Black Sea) its habitat (woods and forests) its leaf characteristics—(long leaves entire to lyrate) and its flowers (comparatively large, a gaping corolla, bifid upper lip, glandular hairs, predominantly violet-blue in color).

BERNARD HARKNESS

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Remarks on some of the less well known species sent:

*Alyssum alpestre*: from the gardener's point of view, exactly like the well known *A. serpyllifolium*, which belongs to the same aggregate.

*Antennaria magellanica*: mats of grey foliage, heads grey and brown; more akin to *A. alpina* than to *A. dioeca*.

*Calandrinia caespitosa*: newly introduced from southern Patagonia, easy from seed; tufts of leaves to 1-2 in. high, among which nestle the white flowers, slightly tinged pink.

*Campanula incurva*: large pale blue bells; monocarpic, but self-sows in dry wall.

*Campanula thyrsoides*: pale yellow flowers, in a candelabra-like spike; biennial, but self-sows mildly.

*Centaurea uniflora*: one of the typical constituents of the so-called "Festucetum spadiceae", a mountain meadow of southern Alps, with *Arnica montana*, *Campanula barbata*, *Gentiana kochiana*, etc.

*Cistus salvifolius*: one of the hardiest of the genus; in Grenoble, stood almost unscathed the winter 1955-56, which killed outright many *Cistus* species, including *C. laurifolius*, said to be the hardiest. A sprawling shrub to 1-2 feet, white flowers.

*Coronilla vaginalis*: very near the better known *C. minima*, but leaves slightly less glaucous, flowers of a clearer shade of lemon-yellow; the plant is hardier.

*Draba carinthiaca*: tufts to 2-4 inches, bearing many small white flowers.

*Echinops ritro*: not for the rock garden, unless this is on a big scale; stems to 2-3 feet, bearing "everlasting" brilliant blue balls.

*Festuca novae-zelandiae*: one of the "tussock-grasses" of New Zealand; forms an evergreen, or better to say, an ever-brown, dense tuft of rigid leaves, to 15-20 inches high.

*Fritillaria pallidiflora*: one of the easiest and best of fritillaries; if not sown in late autumn or early winter, seeds of this genus are liable to remain dormant for a year or more.

*Genista purgans*: a small broom, to 2-4 feet; possibly the hardiest of the genus; no lime.

*Herniaria alpina*: a moraine plant, of no height at all; resembles a greyish raoulia; insignificant flowers; good soil-cover for a dry place.

*Hieracium x pamphili*: thought to be a natural hybrid, *H. villosum* x *H. lanatum*, but true to seed; better than its parents and, to my mind, the best hawkweed; worth growing for its foliage alone; not invasive; 1-1½ feet.

*Iris bucharica*: possibly too tall (1-2 feet) for the rock garden; a very hardy, tuberous species; pretty yellow and white flowers; leaves like those of a leek.

*Koeleria brevifolia*: just a "grass", of very small stature. 2-3 inches.

*Papaver pseudocanescens*: of the *P. nudicaule* kindred, but flowers lemon-yellow.

*Telephium imperati*: insignificant white flowers, good foliage; dryness.

*Viburnum lantana*: very hardy shrub, to 6-10 feet; creamy white flowers, fruits red at first, then black.

—R. RUFFIER-LANCHE, *Grenoble, France*

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Although I grew or collected most of the seeds I have sent, frankly that is not the case with the *Rhododendron komiyamae* and *R. nikomontanum*, which I received from a Japanese friend who is very skilled in gardening. Here in northern Vermont few rhododendrons succeed except native sorts, so rather than face inevitable disappointment with these rare seeds I thought it best to offer them to someone in the ARGS with a climate more favorable than mine to the genus.

Unfortunately I have no information on these two rhododendrons except that they do well in Japan and are recommended for the rock garden.

—DONALD ALLEN

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Farrer's description of (*Campanula burghalti*) as *C. punctata* is a fairly accurate one—except that it is about 2 feet high! It is true the corolla is about 3 inches long—too much of a border perennial. Perennial? I suspect biennial or monocarpic. An interesting plant but I wouldn't want to grow it again.

—W. J. R. ADAMSEN

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*Kuhnia hitchcockii* (*sic*) is a novelty mainly for the sake of novelty but better than some things usually listed in the Exchange. Stems are more or less decumbent, seldom more than 10" high, the plant often more than 20" wide. In August there is much creamy bloom on the puff order but its most conspicuous phase comes in autumn when the faintly tawny pappused seed clusters are displayed for several weeks.

—CLAUDE A. BARR

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*Ixiolirion pallasi*: As you may see from the enclosed advertisement the Dutch Bulb Corporation recommends mulching during the winter months. I have taken their advice and have been mulching mine for the past two winters. We are located in northwestern Wisconsin about eighty miles south of Lake Superior, and we are as cold as New England. We have long stretches of sub-zero weather, often down to -20°F., and it is not uncommon for the temperature to go down to -35°F.

—NEVADA E. SCHMIDT

Some time ago, Peter P. Krieger reported in the *Bulletin* that *ixiolirion* is hardy in Iowa. Here it did well for a couple of seasons, then vanished, while at Cornell it is regarded as not hardy. Reports on its hardiness in various regions would be of interest.—Ed.

## ON EASTERN CLIFFS — IV

KATAHDIN (*continued*)JAMES E. MITCHELL, *Barre, Vermont*

After about two miles of hiking we came to a pretty little pond, the Basin Pond. Here we were somewhat confused by the trails and spent a good half hour before we got straightened out and were on the right trail again—then on for another mile and a half until we arrived at the camp at 7:30. I, no longer young, was tired and glad to rest. The sun had set but the twilight at this season is long in the Northland, and there were two hours of cool and delightful ease ahead of us.

We found that the camp consisted of about a dozen shelters built of peeled spruce logs, closed on three sides but open on the south side and roofed with galvanized corrugated sheet steel; they are scattered over a space of perhaps two acres and are of different sizes and differ a little in construction. Over the ground in some of them is spread a bed of spruce and fir bough, put there by someone who knew how to do it, as we found them quite smooth and comfortable to sleep on. In the center of the camp is a closed log cabin in which live the caretaker and his assistant, who are paid by the state. The assistant, a young man, will for a nominal fee act as a guide for those wishing one. A fee of 25¢ per day for each person is charged for the use of the shelters. We selected an unoccupied one which had a bed of fir boughs for a carpet, and were soon eating a cold supper. The day had been hot down below, but here the air was delightful, and there was enough breeze to keep down the black flies and midges which are prevalent in these woods in early July.

Our shelter was about fifty yards back from the shore of Chimney Pond, and after supper we started to explore the edges of the pond and the base of the cliffs. Chimney Pond is a delightful little lakelet, of perhaps ten acres, situated a little to one side of the center of South Basin, and above it the mountain rises abruptly on three sides for more than 2,000 feet above the pond. The water, like most mountain water, is crystal clear, and is perhaps twenty-five feet deep at its deepest part.

We were to find on the following morning that South Basin, when viewed from above, has the appearance of a deep volcanic crater with the north rim blown away. Later we found that the North Basin gives the same impression. The circular walls of the South Basin are so abrupt and so high above its floor that, we were informed by the guide, this is the impression on every visitor. It is an erroneous one, however, as any geologist well knows, for there is no indication of volcanic action. Some geologists believe that these basins were cut out by the glaciers which undoubtedly filled them during the Ice Age. Then, as now, the snow was blown from the ridges and tableland above into the basins and ravines below. The summer heat was insufficient to melt all of this snow and each winter saw an increase in its depth until eventually a glacier was born. The great mass of rocks left at the mouths of these basins is the terminal moraine of these glaciers.

It was nine o'clock before it became really dark and we were ready to turn in. At about this time, we began to hear the rumble of thunder, and a cold rain soon beat on the corrugated steel roof, making a not unpleasant sound. It

rained, with thunder and lightning, most of the night, and we found that we had none too many blankets. While the two younger men slept well, I was awake most of the night.

It was seven o'clock in the morning before the rain stopped, and then we got up and had quite a job getting a fire started, but soon had hot coffee, fried bacon, boiled potatoes, bread and hot canned beans ready for breakfast. The bushes were wet and we were in no hurry to strike the trail until they had dried, so we washed dishes, wrote a few notes and read a little until about nine, when we decided it was dry enough to try the mountain trail.

Before we proceed, it may be well for me to give a superficial description of the mountain as a whole. While there are a few low mountains to the northwest, Katahdin (formerly spelled Ktaadn) stands by itself lone and high above the surrounding woods and lakes. Some geologists have called it a monadnock, that is, a mountain from which the surrounding country has been denuded, leaving the mountain high and lone. Its general shape is that of a giant fish hook, with the shank extending north and south and the hook on the south end formed by Pamola, the Knife Edge and the Saddle, with the South Basin enclosed in the circle of the hook. Pamola is near the hook's point, while the Knife Edge, at the base of the hook, connects Pamola with the South Peak which is the highest point of the mountain, although from Chimney Pond Camp Pamola looks the highest. Pamola and the Knife Edge are sharp-edged and none but those who can endure great heights should try to climb over them. At South Peak, the top of the mountain begins to widen out and soon runs into the Tableland and then the Saddle. From the Tableland northward, the top of the mountain appears as though it had been planed off, leaving a more or less flat top, broken here and there by the North Peak and other elevations. The width of this top varies, and from its edges the sides fall abruptly to the lowlands. The mountain is about eight miles long from north to south.

On this climb, each of us carried a lunch, as we expected to be on the mountain for the greater part of the day. Wilder had his camera and films, while I took camera, collecting bag and trowel; my son Eugene also had collecting bag and trowel. We went along the north end of the pond to where the trail started up Pamola and there began the two thousand foot climb. The trail is well marked, but of course it is steep and tiresome: one cannot lift oneself a half mile without tiring legs and back.

The trail over Pamola and the Knife Edge is not botanically exciting. However, we had not gone far before we began to see *Vaccinium vitis-idaea minus* and *Empetrum nigrum*, and *Arenaria groenlandica* in very dense clumps and with the largest pure white flowers I have ever seen on this plant. When we began to get near the summit, we found scattered clumps of *Diapensia lapponica*, most of which had passed the blooming stage, but I found one plant in a well shaded spot with its white flowers at their best, and called Wilder to take a picture of them.

The wind was blowing the cloud masses from the Tableland, on the other side of the basin, down over the edge and into the basin. From our side it looked truly strange, so I found a good spot, set up my camera, and tried a high speed shot across the basin. The result was interesting to me, but no one who had not seen those white clouds rolling over and over down the mountain could possibly make anything of the picture.

By the time we had reached the top the wind was blowing a gale and it had become dangerous on that narrow Knife Edge. When possible, we would get on some rocks just below and on the lee side of the trail go as far as possible,

and when we saw a chance would go down a little on the windward side where the gale would hold us against the rocks. Then, when we could go no farther, we would climb on top and, crouching down, make a run to some rock ahead, always in danger of being blown down perhaps two thousand feet below.

At several places where we were well protected from the gale, the young men would get a big loose boulder and roll it over the edge, watching it go down the mountainside until it finally struck a rock with such force that it would fly into a shower of splintering rock. After such a concussion there was always a strange smell in the air, much like that of brimstone. When we returned to camp that night, we were informed that the rolling down of boulders was strictly forbidden on this mountain.

There is not enough soil on most of the Knife Edge for much of anything to grow, but a few plants, mostly alpine grasses, get a toe hold under the lee of some boulders, and there hang on. In passing from Pamola to the Knife Edge, one descends into a deep gorge, and then climbs up over Chimney Rock, which is really part of the Knife Edge. This deep cut between Pamola and Chimney Rock was well sheltered from the wind, and there we ate our lunch.

Here, in 1856, Rev. Joseph Blake, an amateur botanist, first found *Saxifraga stellaris* var. *comosa*, and in this same spot it was found again in 1900 by Prof. Fernald. It is one of the rarest of arctic plants and has also been found in the interstices of great boulders north of West Peak by Dr. Scribner, another botanist. Judging by the written description, I believe it to have no garden value, and spent no time in hunting for it. It is a very rare plant and its location is given here for the benefit of any reader who may care to look for it.

After eating lunch, we proceeded over the Knife Edge, pausing frequently to rest and perhaps to try a shot or two with the camera. It was a poor day for taking pictures, but we got a few good ones. We often stopped to view the surrounding country from our great height (Pamola is 4902 ft.) In spite of the clouds and haze, we could see scores, perhaps a hundred, lakes, ponds and rivers, from mighty Moosehead and Chamberlain Lakes to one little fellow just below us deep in the evergreen woods, which looked like a deep bowl filled with water. Chimney Pond, two thousand feet below, looked like a little piece of glass. Indeed, it has been said of this view that the great stretches of evergreen woods, with their hundreds of lakes and ponds, have the appearance of a vast green carpet on which a mirror has been broken into a thousand pieces. It has been agreed by everyone who has climbed Katahdin that the view from its summit surpasses that from any other mountain in eastern America.

Finally we reached the South Peak, Katahdin's highest point, 5267 feet above sea level. There a tall cairn had been erected and nearby, set neatly into a large boulder, was a bronze tablet giving many details regarding the mountain. From South Peak, the crest descends several hundred feet in one-third of a mile, in a northwest direction, to Monument Peak, from which point the top of the mountain begins to flatten out. From there, proceeding north, we quickly descended to the Tableland. This part of the mountain top is nearly level in a northeast to southwest direction, about half a mile in width. In the opposite direction, the long way of the mountain top, from close to the base of Monument Peak, there is a gradual descent to the northwest for one and a half miles to the Saddle, where the descent stops and the flat top becomes narrow and level in a north-south direction. From the Saddle the flat top extends north for nearly six miles, broken by North Peak and other minor elevations.

Much of this flat top is covered with a lawn composed of high Arctic plants. Here grow thousands of *Diapensia lapponica*, *Vaccinium vitis-idaea minus*,

*V. uliginosum*, *V. angustifolium*, *V. caespitosum*, *Empetrum nigrum*, *Salix uvaursi* and *Arctostaphylos alpina*. The last was in flower and partly grown fruit, which is noteworthy as the same species seldom fruits on the White Mountains. The fact that it fruits so profusely on Katahdin probably accounts for its being so plentiful there, whereas it is comparatively rare on the Presidential Range. *Loiseleuria procumbens* and *Rhododendron lapponicum* were not plentiful in the spots I visited, but I have no doubt that there is plenty of each in many places on the crest. Of course, besides the above there were many varieties of Arctic grasses and sedges which do not interest the practical gardener.

I do not wish to give the impression that the Tableland is nothing but an alpine lawn. Such is far from the fact. There are several stone fields, much like the stone rivers on Mt. Adams, with the cobbles from the size of an egg or smaller up to a few two feet or more across. In these cobble fields little can grow because of the downward flow of the stones. In one of the steeper sections of the Tableland is a large area covered by enormous boulders from four to thirty feet in diameter, with perhaps an average of ten feet. These boulders are plainly stationary and between them is an accumulation of damp black soil. Here I found large mats of *Casiope hypnoides* and *Phyllodoce caerulea*, our two eastern American heathers. Here too were *Diapensia lapponica* and *Loiseleuria procumbens* with a few blooms still left on them, while the bloom of *Casiope hypnoides* was at its best.

Many plants of *Betula glandulosa* var. *rotundifolia* were scattered all over the Tableland, and *Kalmia polifolia* in a fine dwarf form was in all moist places. This had not yet bloomed on the crest, but lower down was in full flower. In one moist spot among the huge boulders were some mats of *Salix herbacea* with small round leaves and creeping stems. However, this willow does not appear to be plentiful on Katahdin. Of course, *Potentilla tridentata* and *Arenaria groenlandica* were everywhere. The Saddle was perhaps the best botanizing ground of the whole crest; however, by the time we had reached Saddle Trail I was tired and very thirsty, for water is not plentiful on Katahdin's crest. My collecting bag was full, as was my son's, so we decided to go down Saddle Trail to the camp. On the way down we found a spring gushing out of the mountainside, a welcome sight; immediately we got down on our knees and quenched our thirst.

While we were on Pamola in the morning, we had looked across to the headwalls of Great Basin and had seen there a large patch of snow. Instead of going down the trail with us, Wilder went along the Saddle until he was above the snow, found a way down the face of the cliffs forming the head of the basin, and reached the snow—a mass of melting ice and snow about fifty feet long, six to ten feet wide and the same in depth. He had hoped to find some *Diapensia lapponica* in bloom close to the snow, but found no blooms and little foliage.

Eugene and I reached camp about four o'clock and ate a hearty cold lunch, after which I lay down to rest, as the climbing had been exceedingly arduous. But Eugene, with the tirelessness of youth, started down the trail to the cars to bring up some more provisions for the morrow. By six o'clock Wilder had come in, after taking many pictures.

By this time I was well rested, and while Wilder was getting himself a lunch, I took my collecting bag and circled Chimney Pond. There were many dwarf *Ledum groenlandicum* in full flower, splendid plants. I also found two violets along the shore, *V. pallens* and *V. conspersa*, while near the head of the pond, beside the brook flowing down from the Chimney, I found *Veronica alpina*, but missed *Viola palustris*, which Prof. Fernald had found there.

I was back in camp about eight o'clock, and as Eugene had not yet returned, Walter and I went down the trail about a mile, where we met him loaded with provisions. We took his load and, dividing it between us, went up to camp and, shortly after, turned in. Again it began to rain at about ten o'clock, and we slept more or less through a cold stormy night.

(To be continued)

## SALMAGUNDI

THE STRANGE BEHAVIOR of Mr. Zollinger's seedlings is not, as he seems to believe, caused by failure to treat his soil mixture with Vancide 51. We had trouble of the same sort, to a limited extent, in 1959, and suspected that the Vancide, which was old, was responsible. During the past season, almost all the hundreds of lots of seedlings refused to root in the peat-sand mixture; only a few primulas seemed content. As in previous years the seedlings rooted at once, and deeply, into the mixture, we started searching for possible explanations, and Mr. Zollinger's report seems to support our conclusion that the peat itself is at fault. Instead of the coarsely ground peat which we used to obtain, local dealers offer only a shredded stuff, different in texture and probably in chemical properties from that formerly available, and we are half-way convinced that many plants do not like it in the least. Fortunately we still have on hand sufficient of the old material for this winter's sowings, and we shall perhaps not use Vancide, except as a check.

Fred Horton of the Department of Floriculture of Cornell University has pointed out to us that the peat used (sphagnum peat) is, unlike the German product, rich in organic matter, and that soluble salts rising to the surface of the jars have burned off the delicate roots of the seedlings; the only way out of the difficulty is to use peat virtually free of organic matter, or to abandon the sowing of seeds in jars.

\* \* \* \*

The announcement (in the President's letter in the October *Bulletin*) that the Secretary plans to move to Arizona and to relinquish his office has caused considerable alarm among members. Mr. Totten has just written us that the idea has been abandoned and that he will remain in the East and continue his duties as Secretary. We can all relax and rejoice that our affairs will continue to be handled so capably.

\* \* \*

We promised to report on seeds sown in pots and in frame, in the conventional way, when our supply of jars was exhausted. The frame sowings were relative failures: seeds of many quick-germinating species failed to appear, although the fault may have been in the seeds. The pots used, after sowing, were placed in "polythene" (we favor the British term) bags of the sort used by local dry cleaners. Germination in most cases was prompt and profuse, especially where it was possible to make the containers almost air-tight. We shall use this method henceforth to a considerable extent.

\* \* \*

A six-inch snowfall on the night of October 24 brought an erratic and exasperating season to an abrupt end. Never in our recollection have plants, even the easy ones, been so reluctant to grow. The rock garden is almost free of the sheets of young violas with which it is normally covered in early autumn.



Even stranger, weeds scythed down in late June and early July made very little fresh growth. No one factor in the weather seems to have been responsible, nor did the season, other than in its effect on plant growth, seem worse than many others in which plants have done well.

\* \* \*

In spite of its humor and garden lore, "The Bush Salesman" has been published with considerable apprehension, lest it might give offense to someone. However, we believe that Mrs. Jezik's character is an extreme and aberrant example of the species. The author has recently written us that the salesman's sins have overtaken him, and that he has been tried and punished, presumably for misrepresentation. The story, pointing out how little the average person can comprehend the workings of a rock gardener's mind, recalls the building of our first rock garden. Constructed from the few rocks available along the sandy shore of Lake Michigan in southern Wisconsin, and built without even Farrer for a guide, it was neither beautiful nor adequate, yet it did nurture a few fairly good rock plants. Our friends assured us that it would be perfect if only we would whitewash the stones!

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