Allan Stavos

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The Bulletin

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HOUSTONIA LONGIFOLIA

MARYANN COLLINS
Apple Valley, Minn.

Having lived and gardened in New England for most of my life, I have had a long and intimate relationship with *Houstonia caerulea*, commonly called Bluets or Quaker Ladies. In May these slender plants, with their four-petaled light blue flowers, each centered with yellow, transform lawns and old pastures into undulating sheets of pale blue by their sheer abundance.

As a child living in a suburb of Boston, I brought home mini-bouquets of Bluets and violets to grace my mother's kitchen windowsill. As an adult gardening in the suburbs of Hartford, Conn., I grew them among more snooty alpines in the rock garden and allowed them to stay when they granted themselves admittance to the sunnier parts of the primrose bed. They were prim and proper, knew their place, and though they self-sowed, they always did so with charm and restraint.

In March of 1976 we moved to a suburb of Minneapolis, Minn. The Midwest was virgin territory to me, and I was anxious for spring to come in order that I could satisfy my curiosity regarding the area's native plants. Most of all I wanted to visit a prairie.

Soon the snow melted and things did not seem radically different. Granted, the sky seemed immense and the land was flat and open, but the trees and shrubs which surrounded homes and filled the wild places were mostly familiar. My first concrete clue that something was amiss was when I noticed *Houstonia caerulea* listed by a local retailer of wild and alpine plants under the heading "Collector's Plants"

for one dollar each. Was it possible that the abundant wildling that I had so recklessly walked upon by the hundreds could be for sale at a dollar a tuft? It seemed an insult to pay for what had always been a gift of nature, but I finally succumbed to homesickness and bought one when spring turned to summer without my ever seeing a single Bluet, neither wild nor cultivated. The purchased plant sulked and soon died. I resigned myself to living without houstonias since at that time; houstonia and *H. caerulea* were synonymous to me.

Late that summer I received a phone call from a new friend and fellow ARGS member. The Minnesota Chapter members had been involved in rescuing plants from a piece of virgin prairie that was soon to be quarried for stone and gravel. They had worked hard, and I was a new body with a new garden.

"How would you like to dig some prairie plants from a virgin prairie?" she asked. "Dig some plants" and "virgin prairie" were about all I heard in my excitement. My husband, stoic and long-suffering, wrote the directions. I dared not admit that I didn't know a prairie plant from a gopher hole for fear she'd change her mind. I had, up until then, been unsuccessful in seeing a prairie as almost all the unwooded land was plowed and cultivated.

My husband and I drove out armed with trowels, plastic bags, buckets, and a copy of *Common Wild Flowers of Minnesota* by Monserud and Ownby in indecently mint condition. My friend's parting instructions were to look especially for *Gentiana puberula*, whatever that looked like. I looked it up as we drove.

I was not sure what to expect; in my mind's eye a prairie was composed of grass as tall as a man on horseback, an image left with me from reading stories of prairie schooners and pioneers in times past. The directions led us to what looked disappointingly like a pasture and, indeed, adjacent and separated by only a flimsy-looking barbed wire fence grazed several cows.

At first we strolled aimlessly about through knee-high grass, but soon began to notice that only in some areas was the vegetation predominantly grass. On small knolls and slight ridges the grass grew low and sparse among exposed pieces of limestone, which had eroded and weathered until intricately pockmarked and coated with a soft grey patina; the kind of stone a rock gardener dreams about. Interspersed with the limestone and tufts of grass were leafy clumps and mounds of herbaceous plants. We had been having a drought and not much was in bloom.

I stooped excitedly to examine what I thought was a plant of *Viola pedata* (turned out to be *Viola pedatifida*, the Prairie Violet) and noticed a pinkish-white four-petaled flower on an adjacent plant. It was somewhat like a single blossom of *Daphne cneorum*, but it belonged to a scraggly plant with a small clump of basal leaves and a couple of eight inch long stems, each topped by a few pinkish stars. It was certainly not spectacular, but I was primed to save the prairie plants, so took it home along with several plants of *Viola pedatifida*, *Anemone (Pulsatilla) patens*, and a car full of limestone.

When I got home and identified the plant with the pinkish-white flowers, I was surprised to find that it was *Houstonia longifolia*. Usually I can assign a plant which is unfamiliar to me to a genus, but this plant did not strike me as being a houstonia, although I certainly knew *H. caerulea* well. I think the reason for this was that *H.*

caerulea's corolla ends in four rather elliptical lobes which spread and flatten sharply at right angles to the tube, while *H. longifolia's* corolla terminates in four pointed lobes which flare out gradually from the tube and reflex back slightly at their tips in the manner of a diminutive lily. This characteristic, more than the difference in flower color and the dissimilar number of blossoms on each stem, lead to the difference in effect.

I planted my new treasures in the as yet 'mostly rock' rock garden. The *H. longifolia* didn't even droop. "Must be a weed," I thought. "Nothing choice would transplant that easily in 90° F. weather." It continued to bloom sparsely until frost. Had I had anything to replace it with, it undoubtably would have been relegated to the compost heap as it was not very attractive.

This spring it sent up many more stems from the basal rosette and by June it was an eight-inch bushy mound studded with pinkish-white stars. It bloomed unceasingly until the hard frosts of autumn ended its display. Throughout the season it never exceeded eight inches in height but became fuller, bushier, and thicker and so regular of form that it looked sheared.

Every visitor to my garden noticed and commented on it, thinking it to be some rare exotic from a far-off land. Little did they know that this was my cue to begin extolling its virtues. With scarcely a pause for breath I mentioned its carefree nature, resistance to weather, and long period of bloom. For their patience, visitors usually went home with a plant of *H. longifolia*, since the original had been joined by several more, varying in color from pale pink to white, which we had rescued from this same doomed prairie. In addition, the original plant seeded lightly about, and propagation by division of the basal rosette proved easy.

It is just as well that propagation is easy, for one Sunday in August we went again to the prairie, and there sat an enormous bulldozer. I cursed. A week later much of the prairie had becomes a shambles of bulldozed soil and the beginnings of a large quarry pit. Although some of the plants are safe, how sad a memento they are to the openess and freedom, the uniqueness and beauty of even a small piece of virgin prairie.

Nonetheless, here in the Midwest I have found another houstonia to love. For me it performs outstandingly, and although straggly and ungainly in infancy and adolescence, it becomes a thing of beauty as it matures. Whether it performs as well for others and in other climates I do not know, for Minnesota has a continental climate of cold winters, with many days when the temperature plunges far below zero, and a fairly reliable snow cover. Summers are hot and dry, and annual precipitation averages about twenty inches.

In my garden the soil is somewhat alkaline, rich, but very heavy. When I constructed the rock garden, I incorporated pea stone and humus into the existing soil to lighten it, but it is still of the consistency of quicksand in spring, yet bakes to the hardness of cement if allowed to dry out in summer. The rock garden is in full sun all day and exposed to the wind. It is under these conditions that *H. longifolia* thrives and *H. caerulea* perished within weeks.

However, this spring I built a second, less exposed garden and begged a flat of *H. caerulea* from a friend in Connecticut. With several plants to experiment with and a greater knowledge of the dimensions and vicissitudes of Minnesota weather, I have thus far

been successful in growing this also. Again, those planted in the hot and exposed rock garden perished, but those planted near the edges of a small artificial bog in the semi-shade of oak trees in the new garden seemed to thrive. They were content enough to seed around a bit by autumn.

And thus continues my relationship with houstonias, but now with two species rather than one, each of different temperament but equal charm.

THOSE COMMEMORATIVE EPITHETS

Everyone agrees that the scientific names of plants are necessary for accurate reference. Many who wish to use them, do so with trepidation and lack of confidence. Perhaps a few recommendations may be helpful.

First, from an historic viewpoint, it is clear there are three surviving forms of Latin: that of classics scholars, the Latin of ecclesiastics and that utilized by the sciences, especially botany and medicine. Each has its peculiarities and special definitions as well as pronunciation based upon historic precedents.

(Suffice to say, on the latter score, no one now living has heard a Roman conversing, so "rules" of pronunciation are pressed according to prejudice, with little agreement. As gardeners, I suggest the main thing is to communicate, so use the sounds most others use, and smile.)

Second, scientific Latin has been formulated to serve as an easy (that's right!) anchor for description and notation understood by a world community of scientists. It also conveniently avoids politics, which you will agree is near-Utopian.

With that preamble, note these simple rules for spelling of species names that commemorate people (using their surnames).

If the person commemorated is a man, the species name ends in ——ii (examples: *Anemone drummondii, Galanthus elwesii*), unless the name ends in ——er or a vowel, in which case only one ——i suffices (examples: *Holodiscus boursieri, Inula hookeri, Mahonia bealei, Nomocharis mairei*).

These names are pronounced drum-*mond'* -ee-eye, el-*wheeze'* -ee-eye, boor-see-*air'*-eye, *hook'*-air-eye, *beel'* -ee-eye (or *beel'*-eye), *mare'*-ee-eye (or *mare'* eye).

If the person commemorated is a woman, then the suffix is ——ae (examples: *Cypripedium hookerae, Omphadoles luciliae;* pronounced *hook'*-air-ee, loo-*sill'*-ih-ee.

These pronunciations are used, and clearly understood, by gardeners and botanists in the English-speaking part of the world. Other parent tongues and cultures influence language in various ways, but we're looking for the easy way. Also, for the record, there are other suffixes indicating commemoration, but all are uncommon in use and thus rare in appearance.

Howard Pfeifer, Willimantic, Conn.

GRANITIC FLAT-ROCKS:

Natural Rock Gardens of Southeastern United States

JOHN AND MARIE WURDACK
Beltsville, Maryland

The granitic flat-rocks of southeastern United States are scenic natural rock gardens, with an unusual complement of plants. This distinctive flora is centered in northern Georgia, with attenuations northward as far as southern-most Virginia and westward into Alabama. The exposed rock area is an estimated 8,000 acres, with about three-quarters of this in Georgia. The flat-rocks were known to the early plant explorers William Bartram, Andre Michaux, Thomas Nuttall, and Lewis Schweinitz. The botanical history was admirably summarized by Rogers McVaugh in 1943; recent plant studies, especially at Emory University and Duke University, have further refined that ecological knowledge.

Certainly the best-known of the flat-rocks is Stone Mountain near Atlanta, Georgia and some of the commoner distinctive plants can still be seen there, as well as at Echols' Mill (Oglethorpe County, Georgia) and along Old Flat Rock Road (Kershaw County, South Carolina); however, the flora on these outcrops has been much disturbed by park development or quarrying. Essentially undisturbed are most of the rock areas at Mt. Panola and Mt. Arabia,

Senecio, Arenaria and Diamorpha on Mt. Arabia in early April

both in DeKalb County (Georgia) and now public property, Heggie's Rock in Columbia County (Georgia), and Forty Acre Rock in Lancaster County (South Carolina). Most of the floristically rich flat-rocks are not prominently elevated above the surrounding piedmont, Stone Mountain being atypical.

While many of the flat-rock plants are also found elsewhere, some are nearly or quite restricted to these outcrops. Two genera, each with a single species, are mostly *(Diamorpha)* or completely *(Amphianthus)* confined to the flat-rocks. *Amphianthus pusillus, Draba aprica, Isoetes melanospora,* and *Sedum pusillum* are listed among Georgia's protected plants. *Isoetes piedmontana, Portulaca smallii, Arenaria uniflora,* and *Sedum pusillum* have been cited among North Carolina's "primary concern" plants.

The habitats on the outcrops include bare rock, rock crevices, shallow depressions or weather pits (often seasonally water-filled), vegetation mats or islands, and seepage zones, as well as the forested margins. The commonest trees at the outcrop edges or in larger vegetation islands on the rocks include *Juniperus virginiana,* Red Cedar; *Pinus taeda,* Loblolly Pine; *Quercus nigra,* Black Oak; and (on some outcrops) *Quercus georgiana;* attractive shrubs include *Chionanthus virginica,* Fringe Tree and *Aesculus sylvatica* as well as a hybrid with *A. pavia,* both dwarf buckeyes. Three ornamental vines are also sometimes found on the flat-rocks: *Gelsemium sempervirens,* Yellow Jessamine, ranging north naturally to southeastern Virginia and barely hardy in protected places near Washington, D.C.; *Lonicera sempervirens,* Coral Honeysuckle; and *Anisostichus capreolata,* Cross Vine, ranging north to eastern Maryland and Illinois.

The outcroppings themselves, apart from the moisture-accumulating areas and vegetation islands, often have a dense and attractive growth of lichens (particularly *Cladonia spp.)* and mosses. In the shallow depressions, depending on water depth and persistence, are seasonal miniature rock gardens, with spring or fall annuals or deciduous perennials such as *Amphianthus,* several species of *Arenaria, Diamorpha, Isoetes,* and *Senecio.* Around the more developed vegetation islands or in seepage areas is a larger flora, with somewhat fewer endemics, including *Coreopsis grandiflora* subsp. *saxicola, Houstonia, Lindernia, Opuntia, Phacelia, Rhexia, Xyris, Yucca,* and several species of *Hypericum, Oenothera, Selaginella,* and *Tradescantia.*

Certainly the natural rock gardens are at their best in early April. Then the marginal areas show the peak flowering of shrubs and vines; the larger tree islands and seepages have patches of *Sedum pusillum, Phacelia dubia* var. *georgiana, Amsonia ciliata,* and *Tradescantia hirsuticaulis;* and the weather pits are zoned pink, white, and yellow with *Diamorpha smallii, Arenaria uniflora, Nothoscordum bivalve, Schoenolirion croceum,* and *Senecio tomentosus.* By summer time, most of the spring plants have vanished, either into seed or below-ground dormancy, and the summer flora does not compare in showiness with the vernal display. However, there are minor color flashes, with *Hypericum frondosum, H. prolificum,* and *H. lloydii, Oenothera fruticosa* var. *subglobosa, O. linifolia* var. *glandulosa, Talinum teretifolium, Polygala curtisii, Liatris microcephala, Rhexia mariana, Tradescantia rosea,* and *Coreopsis grandiflora* subsp. *saxicola.* In autumn, the desiccated lichens and mosses freshen, the Confederate Daisy, *Viguiera porteri* yellows the Georgia and Alabama outcrops,

Agalinis and *Carphephorus* are pink-purple splashes on or near the rocks, the Coral Berry, *Symphoricarpos orbiculatus* bears its long-lasting fruits, *Spiranthes cernua* flowers, and the winter annuals again sprout to prepare for another spring floral climax.

Many of the flat-rock plants are suitable for rock gardens, most of them at least as far north as the Potomac Valley; however, not all those listed below have as yet been grown by us.

Amsonia ciliata — A long-lived perennial (which persisted at Beltsville for five years, but now temporarily extinct there), with very narrow leaves and blue flowers in spring, more pleasant in a rock gardener's ambiance than the commoner *A. tabernaemontana.*

Arenaria uniflora — A winter annual a few inches tall, whitening the flat-rock depressions in spring, probably easy if one can fuss with gathering the seeds for resowing in the fall. Other species in the southeast include *A. glabra* and *A. alabamensis,* both also annuals related to the widespread perennial *A. groenlandica* which is at higher elevations southwards.

Carphephorus bellidifolius — A visually pleasant low Composite, fall-flowering and thus doubly desirable, now being tested (actually a sandy woodland species bordering flat-rocks, at least in South Carolina).

Coreopsis grandiflora subsp. *saxicola* — A perennial flowering for four summer and fall months in Maryland, rather large and sprawling for a small rock garden, much trimmer on the flat-rocks.

Diamorpha smallii — A winter annual, the early spring glory of the flat-rocks, with masses of plants mostly one to three inches tall pinkening the weather-pits, to be cosseted like *Arenaria uniflora.*

Houstonia pusilla — An annual, even smaller and just as desirable as our Bluets, the flowers lavender with a reddish eye.

Hypericum frondosum (synonym: *H. splendens*) — A shrub to three to four feet tall with large yellow flowers, quite hardy in Beltsville, common only on Stone Mountain in Georgia but widespread in the Tennessee cedar glades.

Hypericum lloydii — An ericoid shrub usually only six to twelve inches tall, common on Forty Acre Rock and hardy at Beltsville, the flowers rather small but a good yellow over a long period in summer and fall.

Diamorpha smallii on Mt. Arabia

Liatris microcephala — A very trim species at Echols' Mill, attractive in flower, tending to sprawl in a well-watered garden.

Nothoscordum bivalve — An onion with odorless foliage, the white flowers often appearing in both spring and fall, dormant in summer's heat, quite hardy, rather inconspicuous but pleasant.

Phacelia dubia var. *georgiana* — Another winter annual with rather pale purple-blue flowers, dainty and desirable like the wide-spread typical varietv.

Rhexia mariana — A perennial happy in dryish places, the flowering starting later than *R. virginica* and lasting until frost, the petals white to pale (rarely rich) pink. All the thirteen species of *Rhexia* have been tried at one time or another in Beltsville and none other than *R. mariana, R. nashii,* and *R. virginica* have survived more than a few winters.

Schoenolirion croceum — A modestly pleasing lilaceous perennial widespread in southeastern United States, with grasslike leaves and bright yellow flowers in early spring, dormant in summer, the leaves reappearing in fall, hardy and long-lived in Maryland.

Selaginella tortipila — Common only at Heggie's Rock but there forming large low mats, along with the sandhill *S. arenicola* very desirable for rock gardens (but perhaps not reliably hardy northward).

Senecio tomentosus — An attractive species with a woody base, wooly leaves (which die down in summer and reappear in fall) and yellow flowers, growing in large colonies on the flat-rocks, widespread in southeastern United States and hardy northwards.

Talinum teretifolium — The most widespread of our eastern species, desirable (although similar to the others) for the flowers opening late on summer afternoons. Another technically distinct species, *T. mengesii,* has also been recorded from a few flat-rocks. All the southeastern Fameflowers (including *T. appalachianum* and *T. calcaricum)* are hardy in Maryland.

Tradescantia hirsuticaulis — A low-growing and very desirable perennial from the South, especially common on the Georgia flat-rocks, the flowers in April, the leaves dying back in summer and reappearing in late fall. Our Maryland colony of the common blue-flowered form has persisted for ten years, but a plant with pink petals died out after a few seasons.

Tradescantia rosea — Only the typical form of this most desirable but rather short-lived perennial (taxonomic opinion tending to regard the placement in a separate genus, *Cuthbertia,* as currently correct) is known from (but not restricted to) the Georgia flat-rocks. Even more attractive and commoner, at least on the coastal plain, is the narrow-leaved var. *graminea.*

Viguiera porteri — A showy and very late-flowering (September-November in Beltsville) annual composite, mostly only twelve to eighteen inches tall on the flat-rocks but more robust in gardens. Despite the common name in Georgia, the species is named for a Pennsylvania clergyman-botanist who was the first naturalist (in 1846) to visit Stone Mountain.

Our visits to the flat-rocks started some time ago (for one of us, in 1943, courtesy of the U.S. Army). The photography was helped immensely during the spring of 1977 under the guidance of Madeline Burbanck, Bill Murdy, and Bob Platt of Emory University, Bob Kral of Vanderbilt University, Alex Harvill of Longwood College, and Bob Wilbur of Duke University.

Collect Seed for the Seed Exchange. Start Now.

EARLY PLANT EXPLORERS OF THE PACIFIC COAST

WAYNE RODERICK
Berkeley, California

The first plant described from the West Coast of North America was *Abronia umbellata.* This was from the seed collected on the French expedition led by Jean Laperouse and collected by Collignon while they were at Monterey, California, in September 1786. A few other seeds were collected and some plants were mentioned but little else was done.

The Capt. Geo. Vancouver Expedition of 1791 to 1795 along the west coast of North America had as a botanist, Dr. Archibold Menzies (1754-1842). He collected a large quantity of specimens but as most were filed away and not looked at for forty or fifty years, many were re-found in the interim and described by others. The plants we associate with the name of Dr. Menzies are the Coast Redwood, *Sequoia sempervirens,* and the Douglas Fir, *Pseudotsuga menziesii,* but he also found many plants suitable for the rock garden; among these are *Phyllodoce empetriformis, Clintonia uniflora, Disporum smithii, Penstemon davidsonii, Gentiana sceptrum, Brodiaea pulchella,* and *Vancouveria hexandra.* Why he named a plant after George Vancouver considering all the trouble he had with that Captain is something of a mystery; however, in those days captains were pretty much all tyrants, the best known from this period being the infamous Capt. Bligh.

The Lewis and Clark Expedition of 1803-1806 was set in motion to explore the enormous territory that the United States had acquired from France and to seek a good route by water to the Pacific Coast. The expedition was also urged to collect whatever natural history specimens they found along the way. Among the horticulturally valuable plants found by Capt. Meriwether Lewis (1774-1809) and Capt. William Clark (1770-1838) were: *Erythronium grandiflorum, Lewisia rediviva, Fritillaria pudica,* and *Trillium ovatum.* The year of the Louisiana Purchase, 1803, was spent preparing for the trip; it was not until the late spring of 1804 that the expeditionary force left St. Louis progressing that summer and autumn as far as what is presently North Dakota where it spent the winter. In 1805 the men traveled on to the Pacific where they built Fort Clatsap as winter headquarters. Very early in 1806 they started back for home collecting as they went the spring flowers where before they had collected summer flowers.

On their way west in the summer of 1805, Lewis and Clark had bought roots from the Indians which these natives called Bitter Root; it was after this plant that Lewis and Clark named this area of what is now Montana. On their way home they found the Bitter Root in bloom and noted the plants were succulent. In order to press succulent plants these should be boiled to break down the cells; otherwise they do not press well. Undoubtedly Lewis and Clark neglected to take this step, for a year and a half later when the botanist who received the collection of

specimens opened the herbarium to examine the sheets of dried plants he found that one of the pressed specimens of the plant named Bitter Root was growing! He potted the plant; it grew and bloomed. He said it was a new genus which he named *Lewisia* after Capt. Meriwether Lewis and, because of the plant's amazing ability to revive after being dried and pressed for so long, he gave it the species name *rediviva.* The genus *Lewisia* is a western North American genus with the center of distribution in Yosemite National Park where seven species have been found.

Another new genus discovered by the Lewis and Clark Expedition was named for Capt. William Clark: *Clarkia* to which our garden clarkias, sometimes called godetias, belong. The first clarkia was most likely found somewhere in Montana or Idaho. Clarkias are restricted to western North America with the exception of one species in southern Argentina.

After the expedition was over President Thomas Jefferson, an ardent plantsman, who was largely responsible for instigating the expedition, received many of the pressed specimens and seeds collected on the trip. These he turned over to his favorite nurseryman, Bernard McMahon for whom *Mahonia* was named. The German botanist Frederick Pursh happened to stop by this nursery during his American travels and, seeing the seeds and pressed plants, asked if he might "look" at them. It was later discovered that he had walked off with much of the expedition's material! In my research this seems to be one of Pursh's most "famous" contributions to botany.

The next expedition that brought a botanist to the west coast was that led by a Russian, Count Nicholas Romanzoff. On the Romanzoff Expedition was the French botanist Louis Chamisso (1781-1838) and a German physician and naturalist, Dr. Johann Eschscholtz (1793-1831). They came south along the coast stopping at several places. In October, 1816, the expedition spent a month in what is now San Francisco; it was at this time the California Poppy was found. This was named *Eschscholzia* by the French botanist for the German doctor while they were both working for Russia in Spanish territory. Chamisso also found a few other plants that are suited to the rock garden: *Romanzoffia* and *Ranunculus eschscholtzii.*

It is interesting to note that in giving the generic name to the California Poppy, Chamisso misspelt Eschscholtz's name so the scientific name of the plant is *Eschscholzia californica.* After the expedition Chamisso became a German citizen and, to this very day, is famous in that country for his love poems supposedly written to Eschscholtz.

In 1824 to 1827 and again in 1831 to 1833 the Horticultural Society of London (later the Royal Horticultural Society) sent out a collector to the west coast by the name of David Douglas (1798-1834), who has come down to us as the dour Scotsman. It is said his mother sent him to school at the age of four to keep him and his father from fighting so much. Douglas was a massive collector, sending back hundreds of pounds of seed and pressed plants. He was paid a hundred pounds per year plus expenses. It is interesting to note he put in a bill for sixty-six pounds for three years expenses. Douglas is mostly remembered for his introductions of the Douglas Fir, Sallal *(Gaultheria shallon)*, and the Douglas Iris. He collected many of our great plants; several species of calochortus and fritillaria, erythronium, *Delphinium nudicaule*, Sugar Pine, and Poison Oak.

to mention only a few of the many hundreds of species.

In the olden days most ships stopped in the Sandwich Islands (presently the Hawaiian Islands) for water and other supplies. In 1834 Douglas went to Honolulu to board a ship for England. While waiting he went to the island of Hawaii for a few days and while there he fell into a deep pit which had been dug to trap wild cattle and was killed by a bull. It is true that at this time he was having eye trouble but he also had not made a friend of his host of the night before his death. To this day it is debated whether he fell or was pushed. It is stated that he left only one true friend: his little dog.

Thomas Nuttall (1786-1859) came to North America in 1809 and for two years collected seed for Barton, his pay being eight dollars per month plus expenses. He did not like carrying a gun even in hostile Indian country so he used the barrel for digging up plants. From 1812 to 1834 he did much collecting in what is now Montana and the Dakotas and also the Arkansas River area. Toward the end of this period he spent most of his time at the Harvard Botanical Garden. He returned west in 1834 with Capt. Nathaniel Wyeth who was to establish a trading post west of the Rockies. It was in the area somewhere beyond Fort Laramie but before they arrived at Fort Walla Walla that *Wyethia* was found. Nuttall seems to have described many of the plants he found while in the field and *Wyethia* seems to be one of these plants. It was at Fort Vancouver that Nuttall found the Western Dogwood, *Cornus nuttallii*. How it was missed by Menzies and Lewis and Clark is one of the mysteries of western botany; Douglas thought it was the eastern species, *Cornus florida*. Some of the other plants suitable for the rock garden that Nuttall found are *Leucocrinum montanum*, *Oenothera ovata*, *Oxalis oregana*, and *Spiraea densiflora*.

In 1841 Nuttall's uncle died in England leaving his estate to his nephew. This uncle had a publishing house and many years earlier had apprenticed Nuttall to a printer which Nuttall disliked so he quit and came to America. Nuttall was his uncle's only heir but the will specified that he had to stay in England for nine months of every year. The estate was so large that Nuttall therefore stayed in England, making only one trip back to America, spending (in order not to break the terms of the will) the last three months of one year and the first three months of the following year out of England.

The U.S. Navy Expedition under Capt. Charles Wilkes spent the years 1838-1842 exploring along the West Coast, most of this time in Oregon and Washington. The botanist on this expedition was William Brackenridge (1810-1893). He was always in trouble with the expedition as he preferred to walk so he could collect more, thus holding up the rest of the company. In the late summer of 1841 a party was sent out to find how close the Sacramento River came to the Columbia River. It was about this time that it was proven that the Santa Buena Ventura (Sacramento) River did not go east to the Rocky Mountains but north to Mt. Shasta, a mountain more remote than it was thought to be. On October 5, 1841, somewhere on Mt. Shasta, the Indians of the area decided they did not like the intruders and, with arrows coming thick and fast, the expedition decided to make a fast side trip in a westerly direction. It was during this fast detour that Brackenridge saw an

unknown plant. He stopped his horse, jumped off, grabbed a specimen, and, remounting, took off like mad to catch up to the rest of the men; thus was discovered one of the world's most unusual plants: the Cobra Plant, *Darlingtonia californica.*

Brackenridge's massive collection of plants was the first made for the Smithsonian Institute.

In 1846 the Royal Horticultural Society sent Theodor Hartweg (1846-1871) to California to collect seed of the California Fuchsia and the Chinquapin and whatever else he might find with the understanding that if he did not bring back the two things he was sent out to collect he would not get his pay of one hundred pounds per year. Hartweg arrived at Monterey at a time when English speaking persons were not well accepted because of the war with the United States. Therefore his first year was limited to the area around Monterey and San Francisco with only a short visit to the Russians. In 1847 he moved to Sutter's Fort and from this base explored the Feather and Yuba Rivers. He not only collected the required *Zauschneria californica* and *Castanopsis* but many other good plants, among them: *Fritillaria recurva, Iris hartwegii, Calochortus monophyllus,* and *Peltiphyllum peltatum.* Later in the year he returned to Monterey and found the famous Monterey Cypress. In 1848 he returned to England with about 400 species of plants.

Capt. John Fremont (1813-1890) made three of his four trips to the far west. If one reads Fremont's or his father-in-law's reports one is told what a fine person Fremont was. However, if one reads a report written by the Mexicans or by Sutter on the same subject it is a completely different story. Fremont had no qualms about helping himself to whatever he wanted and eventually the Mexican government in Monterey sent him a message ordering him to leave California. Somewhere south of San Jose where the order caught up to him, he took over a home and made it into a fort, but after a few days of waiting for an army which never came, he returned to Sutter's Fort. It is most likely that it was after he had left Sutter's Fort and was headed south along the base of the Sierra Nevadas that he found *Fremontodendron californicum, Carpenteria californica* and, higher in the mountains, *Calyptridium umbellatum* and *Sarcodes sanguinea,* the spectacular Snow Plant. At the south end of the San Joaquin Valley he went over Tehachepi Pass and found *Yucca brevifolia,* the Joshua Tree.

With all his blundering ways, it is a wonder his men stayed with him as he tried and finally succeeded in crossing the Sierra Nevadas in February in the worst of snow storms and insisted on crossing the deserts in the dead of summer. It was while trying to cross the Sierras over Carson Pass in February of 1844 that he found *Calocedrus decurans,* the Incense Cedar.

The great English nursery of Veitch and Sons sent William Lobb (1809-1864) to California in 1849 at the height of the Gold Rush; fortunately for them Lobb was such a good plantsman he cared nothing about gold. During his first two years he collected mostly among the coastal mountains discovering *Delphinium cardinale,* to name only one of his many finds. In 1852 he went to Oregon, returning to California in 1853 and it was on this trip that he found *Rhododendron macrophyllum* and *Lilium columbianum.* On his return to San Francisco he visited Dr. Albert Kellogg who showed him specimens of the great plant discovery of 1852, the Big Tree, which Dr. Kellogg was in the process of

describing. Lobb took off for the Sierras like a shot out of a gun but at first missed his mark and went up to the summit where he found *Primula suffrutescens.* (We will hear more on this when we meet Brewer.) Finally, however, Lobb did get to the Calaveras Grove where he dug up two plants of the treasured Big Tree and collected much seed, after which he came back to San Francisco as fast as he could and took the first ship out, heading towards home.

As soon as he arrived in England he took his herbarium specimens to Dr. John Lindley of The Royal Horticultural Society, who quickly described the newly discovered tree as *Wellingtonia gigantea* in honor of the English hero, publishing the name in the Gardeners Chronical in December 1853. Then the fight started! Dr. Kellogg's name of *Taxodium washingtoniana* in honor of Martha Washington was published in 1854; then in 1855, the name was changed to *Sequoia wellingtonia* and again late in 1855 to *Sequoia gigantea.* (*Even this name is presently in question. The Big Tree is listed in* The Royal Horticultural Society Dictionary of Gardening *as* Sequoia wellingtoniana. *In* Hortus *and* Rehder, *both American publications, the Big Tree has been placed in a monotypic genus of its own and is known as* Sequoiadendron giganteum. — *Ed.)*

In 1855 Lobb came back to California though not under Veitch's patronage. There is not much known of this period; he did some collecting for Veitch and others but most of his time was spent in San Francisco where he died in 1864 of a mysterious illness.

Dr. Albert Kellogg (1813-1887) of Big Tree fame, came to California at the start of the Gold Rush but moved to San Francisco in 1850. He was a physician and botanist and was the first resident botanist in the state. It was Dr. Kellogg who was the founder of the California Academy of Sciences. He did some travelling and botanizing but he mostly described new plants discovered by others. However, it was Dr. Kellogg who found *Lilium pardalinum* in what is now the city of Oakland and *Allium unifolium* in the Oakland hills. *Lewisia kelloggii* and *Lilium kelloggii* are two of the plants named in his honor. But of all of his botanical work he is most frequently remembered for his fight over the naming of the Big Tree. And, eventually, he did get his wish of naming a plant after Martha Washington: *Lilium washingtonianum.*

John Newberry (1822-1892) was the botanist on one of the railroad surveys led by Lt. Williamson. This was the northern survey which came west into the Oregon and Washington area and then south into northern California. Most of Newberry's collecting was done in Oregon and Washington. Two of the more showy plants he collected were *Gentiana newberryi,* found somewhere near the Oregon-California border, and *Penstemon newberryi,* most likely found on the side of Mt. Shasta. Sometime or other Newberry got down to southern California and out onto the desert where he found the Desert Lily, *Hesperocallis undulatum* and the Desert Mallow, *Sphaeralcea ambigua.*

In 1863 the state of California started the State Geological Survey under Prof. Josiah D. Whitney, for whom Mt. Whitney is named. The field leader and for a time botanist for the survey was William Brewer (1828-1910). Brewer and his men were extremely energetic people: after surveying the mountains all week, sometimes on Sundays, just for a lark, they would climb a mountain. Brewer found some of our best known mountain plants while he was on the survey; he discovered the Sier-

ran Red Heather. *Phyllodoce breweri*, also *Lupinus breweri* and *Epilobium obcordatum*, to mention a few. Along with Lobb, he is credited with finding *Primula suffrutescens*. It was ten years earlier, however, that Lobb was most actively collecting, so how they could have been jointly credited with the discovery of this plant is something of a mystery. Brewer went into the Sierras when Lobb was very ill (he died shortly thereafter) so it seems unlikely that they could have been in the field together. Brewer was shortly replaced as botanist on the survey by Dr. Henry Bolander (1831-1897) but while he remained with the survey he continued collecting. In 1863 when Brewer and his men were up in the mountains, Bolander worked around the greater San Francisco Bay area and it was he, in 1864, while working north of San Francisco, who discovered the Mendocina Dwarf Forest. Still farther north he found *Erythronium revolutum* and *Cypripedium californicum*. In addition to these, Bolander is credited with the finding of *Lilium bolanderi*, *Silene hookeri* var. *bolanderi*, *Veratrum fimbriatum*, and many others.

When John Lemmon (1832-1908) was a boy his mother told every one he was "born a botanist"; from the time he could walk he was doing something with wild flowers. During the Civil War he was captured by the South and spent three years in a prison camp from which he emerged at the end of the war more dead than alive, weighing less than ninety pounds. In this weakened condition he went west to his brother's home in Sierra Valley, arriving so exhausted that he could neither stand nor walk; yet within a few days he was able to go outside and holding onto the fence near the front door found five wild flowers, three of which later proved to be new species. Within a short time he was walking around. Lemmon soon became friendly with the local school teacher who was also interested in the native flowers, but unfortunately could not help to identify the plants Lemmon found and so they sent fifty specimens to Dr. Bolander. He, in turn, sent the pressed specimens on to Dr. Asa Gray at Harvard who declared not less than ten as new species, one of which is the delightful *Potentilla millefolia*.

On one of Lemmon's botanizing trips into Nevada he described the mosquitoes as being "9,473,608 solid feet deep" and said that he slept in a tent under five blankets with a kettle over his head but that even so the mosquitoes ate him. In 1880 he became the State Botanist and moved to Oakland. During this period he spent most of his time in the field and must have explored every corner of the state. It is he who found *Calochortus clavatus*, *Caulanthus inflatus*, and *Phacelia campanularia*.

Alphonso Wood (1810-1881), principal of the Brooklyn Female Academy and author of a botany book, came to California in 1866 for a short time. He did his botanizing in the northern part of the state where he found *Phlox adsurgens* and *Brodiaea ida-maia*. The discovery and subsequent naming of this brodiaea gives rise to another interesting story. In the mining country where he worked, Wood discovered in short order that bachelors were poor cooks and not very good housekeepers, so on his travels he tried to stay in homes where there were wives and families. Somewhere in the Weaverville and Trinity area, he persuaded a stage driver to put him up for the night. Most likely during the evening he told the family about his botanizing and the next morning, when he was about to leave, the stage driver's daughter said, "Oh, Mister, Mister, if you find

a new flower will you name it for me?" This was the day he found *Brodiaea ida-maia*

Thomas Howell (1842-1912) was a poor farmer who lived in southern Oregon and spent most of his early life struggling to make a living, but he was always interested in plants and when he was in his forty's he taught himself botany, becoming so expert that many other botanists encouraged him to take it up professionally. He did extensive collecting over wide areas and will be remembered gratefully by all rock gardeners for his discovery of *Erythronium hendersonii* and *Lewisia cotyledon*. Howell wrote *A Flora of Northwest America* but he was too poor to have it published. Nothing daunted, he bought a press, set his own type, printed and bound his book himself, completing it shortly after 1900. What a work of love! And so it is with this dedicated botanist that I shall bring this story of early plant explorers of the Pacific Coast to a close.

Daphne Cneorum and its Form, Eximia

JAMES E. CROSS

Cutchogue, N.Y.

Daphne cneorum, the Garland Flower, is widely desired for its flowers and fragrance but has a reputation, among even the best gardeners, of being eccentric if not difficult. Of the theories advanced as to the plant's likes and dislikes, the most common and certainly the one that extends the furthest back in the history of arguments among gardeners, is that concerning pH of the soil. There is no question that *Daphne cneorum* tolerates or even likes lime; however, the addition of or absence of lime will not measurably prevent or hasten this plant's demise. One must look elsewhere for the answer to longevity.

This plant has two extreme dislikes, wet feet and nitrogen salts, and either by itself will finish the plant in short order. If you plant *Daphne cneorum* in *very* sandy soil behind a rock wall, or arrange some other combination of factors to ensure perfect drainage and apply *no* fertilizer you should, with perhaps just a bit of luck, have your daphne bloom for many, many seasons. It will not, however, even with the bit of luck, provide a particularly attractive plant between blooms.

There appears to be a far better alternative in the very different plant which carries the name of *Daphne cneorum* 'Eximia'. This name, meaning

beautiful, is appropriate, for this is definitely a superior form — so much so that one might question how it could derive from the species. It grows at about two-thirds to three-quarters the rate of the species with corresponding less tendency to be leggy. It is much more evergreen with the foliage persisting well down the individual stems. This provides the pleasing result that, even in the dead of winter, it makes an attractive mat covering the ground. It appears to bloom as heavily as the species. Most important, it is clearly not as sensitive to water, and therefore is easier to maintain in healthy condition when being propagated and when planted out in the garden. Without attempting a logical explanation, it transplants at any stage with appreciably less risk of loss.

Dormant hardwood cuttings of *Daphne cneorum* root readily when taken from October into December and possibly beyond. Soft summer cuttings have not been tried but should do all right if maintained in viable condition. A light hormone and bottom heat shorten the time of rooting. A light wound of one-half inch made on one side of the stem with a single edged razor-blade will produce a heavier and better adhered root system, which, in turn, presumably makes successful transplanting more certain. Straight Perlite as a rooting medium will produce a high percentage of rooting if the propagating facility tends to be on the wet side, or if a humidity chamber is used. This medium has the disadvantage of producing a coarse, brittle root which needs gradual acclimation to any growing-on medium with a goodly organic content. A good acclimation procedure is to lift the rooted cuttings, *lightly* prune only the longest roots, and set them right back into the same Perlite (after mixing into it a third or so of peat), and returning them to the same environment in which they were rooted for one to two weeks. With 'Eximia' one can use a combination of peat and Perlite, about half and half, as a propagating medium and thus produce more normal roots at the outset with a high ratio of success even under wet and humid conditions.

One other interesting note regarding propagation: with dormant hardwood cuttings of most daphnes, the percentage of rooting seems to be in direct relationship to the amount of good foliage on the cutting when it is taken. This may help explain why 'Eximia', aside from being quite different in appearance from the species, roots so much more readily and reliably. This selection is a worthy addition to almost any garden where good drainage can be provided.

TWO DRYLAND FERNS

PANAYOTI P. CALLAS
Boulder, Colorado

What is it about the dryland ferns that is so appealing? Surely their fascination doesn't just boil down to the paradox of wet climate plants evolving to grow in the full sun of some of the hottest deserts in the world. Beyond mere novelty or quaintness, the very adaptations these ferns have made to grow among cactus and yuccas, are in themselves exceedingly beautiful; fronds as downy as polar bears in *Cheilanthes eatonii* or *Notholaena sinuata* var. *integerrima;* others like *Pellaea truncata* are as shiny and blue as metal. Few plants can compare with the Zig-zag Cloak Fern, *Notholaena fendleri,* in intricate detail; the strongly flexuous rachis branching into multiple pinnation, with tiny blue pinnules backed with white wax are a miracle of complexity. Yet this same fern haunts some of the starkest terrain in the Southern Rockies.

For many years I thought I was subject to a rather lonely enthusiasm. One of the many delightful revelations for me in attending the First Interim International Rock Plant Conference was to meet others interested in these unique — and largely American — plants. The rock fern display in Seattle was undoubtedly the first time many of these elusive xerophytes were ever displayed in public. This display provided an exceptional opportunity to compare dozens of living specimens grown to perfection. I was a little chagrined to notice that several Colorado rock ferns were missing. It is the responsibility of local gardeners to publicize their backyard plants.

In the first comprehensive survey of the ferns of Colorado, Dr. Edgar T. Wherry ruefully notes that my native state "is far from being ferny"! It is true that you can travel over hundreds of miles on the plains and see no ferns from your car, and more surprisingly traverse the entire Rockies and view nothing but dwarfed and scattered colonies of Bracken. Ferns do not form a prominent element of the landscape here as they do in more humid climates; we have no coastal beaches for Deer Ferns to carpet, and our forests are never undergrown with countless Sword Ferns. Our alpine screes are lucky to boast a few Fragile Ferns; never the ostentatious drifts of Maidenhair or dwarf *Polystichums* not to mention the ubiquitous *Cheilanthes gracillima.*

In order to find ferns in Colorado, you must get out of your car and walk. If you do this, you may be surprised at the large number of Pteridophytes that have been discovered in the state. Sixty-five species are definitely known for the state, and many of these have only been found in the last few years. Most of these are found only locally in a few remote spots. A surprising number of ferns reach extreme limits of their overall range in the state; *Cystopteris montana* from the north, *Onoclea sensibilis* from the east, *Notholaena standleyi* from the south and *Pellaea breweri* from the northwest are typical of this. In many instances, extreme stations in Colorado represent especially hardy clones of otherwise tender species.

Cheilanthes fendleri

Although desert ferns are as temperamental as they are beautiful (recommending themselves all the more to ambitious gardeners), I have always cherished a plant that can hold its own in the garden. Few are more amenable than *Cheilanthes fendleri*. The genus *Cheilanthes* somehow epitomizes dryland rock ferns. *Notholaenas* may be more glamorous, and *Pellaeas* more architecturally pleasing, but *Cheilanthes* first leap to mind when desert ferns are mentioned. This is the most

P. P. Callas

widespread genus of such ferns. One species or another can be found from Japan across Central Asia to the Mediterranean basin. They are equally common in the Southern Hemisphere in New Zealand, Africa and South America. They are perhaps nowhere more common or varied than in the southwest of the United States — but several species range over much of the continent. Of the more familiar sorts, only *Cheilanthes lanosa* really responds to cultivation in the rock garden. Its deep green fronds, however lovely, don't really do justice to the reputation of the genus for woolliness and "xerophyticism." *Cheilanthes gracillima* represents the genus in the Pacific region and *Cheilanthes feei* is probably the most abundant overall. Both of these are lovely plants, but neither can really be recommended to the average rock gardener since they are sensitive to excess moisture and resent division. Since they both grow from a central crown, and the latter species demands to grow not in soil, but in crevices of limestone — they should always be grown from spore rather than decimating wild colonies.

In Walter Phillips' survey of Arizona ferns, he notes that *Cheilanthes fendleri* "reaches the highest altitude of any of the various *Cheilanthes* species" in the state. This is in itself a clue that even in its southernmost forms, *Cheilanthes fendleri* possesses a degree of genetic hardiness and tolerance to moisture unusual in the genus. So far it has only been found in Arizona, New Mexico and Colorado. In Colorado it occurs in a narrow belt of foothills bordering the Great Plains from just south of the Wyoming border southwards. I have always found it growing in decomposed granite soils on steep, rocky slopes. It has been found on sandstone and a few times on limestone as well — so I suspect that it isn't too fussy about soil acidity. It will persist for some time in the shade of growing pines, but the best colonies occur in full sun where its usual companions are cactus and yucca. In nature its fronds are often curled tightly because of cold or drouth, but open quickly with cool weather after rains.

In the garden it seems to respond to cooler, moister conditions. My best

colonies are in the open, northern exposure of my house where they have spread and been repeatedly divided over ten years. Although little sun falls on them directly, the deep granitic scree dries so quickly that I water daily in hot weather. This treatment has killed every lewisia I have planted nearby, but *Cheilanthes fendleri* flourishes nonetheless. Its companion plants are *Saxifraga x apiculata, Synthyris lanuginosa and* campanulas.

Despite the cool site *Cheilanthes* in the garden are of identical stature and texture with those of the wild. It superficially resembles *Cheilanthes feei* (which sometimes grows nearby), but even a cursory glance can distinguish them. *Cheilanthes feei* is covered with a fine tomentum — the undersurface of the frond is reddish in color and the upper a whiter color than *Cheilanthes fendleri.* More importantly *Cheilanthes feei* grows from a central crown, and usually splays starfish-like from tiny crevices out of vertical cliffs. *Cheilanthes fendleri* is rhizomatous and individual plants can cover many square yards. It grows in open soil (but always perfectly drained and usually on the steepest of slopes) and its fronds are always held erect and grow so densely as to suggest a miniature coniferous forest (as a niece of mine first pointed out). The top surface of the fronds is of a dull blue-green color, but the stipes and undersides are chaffy with many tiny scales. It has been confused with *Cheilanthes tomentosa* — which can grow to fifteen inches — but lacks the white woolliness of that species. In nature or the garden, *Cheilanthes fendleri* will rarely exceed six inches in height, and usually only grows to four inches.

From my experience it would seem that this is the easiest of the western cheilanthes to grow. Once established, it will spread (slowly to be sure) by its rhizomes to eventually cover a large area. Since several specialist nurseries have begun to offer it, there is no longer any excuse for its absence from gardens.

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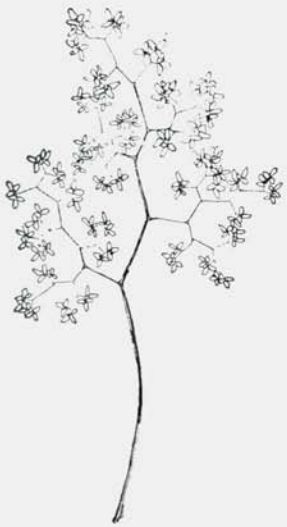
Notholaena fendleri

If any proof were needed to show how relatively unexplored horticulturally much of America remains, I can think of no better evidence than our ignorance of the Zig-zag Cloak Fern *(Notholaena fendleri).* This lovely endemic of the southern Rocky Mountains is absent from all the "standard" fern gardening guides; it is never mentioned in rock garden journals, and can hardly be said to be in cultivation. And yet there is hardly a canyon in northern New Mexico or Colorado that doesn't boast a few cliffs filigreed with this most intricate of native rock ferns.



P. P. Callas

Rock gardens, as we inevitably discover, are as fertile of paradox as they are of weeds and splendor. The bitterest ironic pill is that plant that repeatedly denies us. If this same plant flourishes in a nearby garden or the wild, the irony is complete. I am condemned to live a short distance from whole canyonsful of *Notholaena fendleri* and though I have its close relatives growing healthily for me, my favorite rock fern is represented by only a few miserable clumps. It is so elegant, however, I feel it deserves wider recognition. Surely some more accomplished gardeners than myself will some day learn how to tame it, perhaps from spore-grown material.

The Zig-zag Cloak Fern and its closet relatives have pestered taxonomists over the last century. There is still no consensus as to their proper generic classification, since they share many traits with both *Notholaena* and *Pellaea*. You are apt to find the Zig-zag Fern and its closest allies under either name, since the characters used to distinguish the two genera are intricate, confusing and often contradictory. For instance, the heavy coating of wax on the undersurface of the pinnules is typical of *Notholaena*. This wax is present on *N. fendleri*, but altogether lacking in the closely allied *N. parvifolia*.

N. fendleri isn't apt to be confused with any other native fern, despite the bafflement of scientists. Its stipes are dark brown, very brittle, branch repeatedly into a "flexuous," which is to say zig-zag pattern which is responsible for the appropriate common name. The smaller stems continue to branch alternately up to four times, resulting in a quadripinnate frond — unusual in such a diminutive fern. The pinnules are finally suspended on pedicels so fine as to appear to float in mid-air, resembling a sort of fine mist, or, during drought, the pinnules recurve to reveal the white undersurface at which time the plant looks like nothing so much as a piece of lace. Its closest relatives are easily separated by their range, their preference for limestone and the opposite arrangement of their branching. *N. limitanea* is more southwesterly in distribution, while *N. dealbata* is from the lower Mid-West. *N. parvifolia* is from the hot, limestone deserts of the South West, and perhaps most closely resembles the Zig-zag Fern. It is less strongly flexuous, however, and lacks the white wax on the lower surfaces of its pinnules.

I have never found *N. fendleri* on limestone, but it is locally abundant over moderate altitudes in the southern Rockies. It prefers to grow in the tiniest crevices of granitic boulders from 4,000 to over 9,000 feet in elevation. It is more commonly found in areas with relatively low precipitation — under fifteen inches of rainfall annually or less. Although it is sometimes found on rocky slopes overgrown with Ponderosa Pine, it seems to grow best on bare cliffs that are quite exposed to wind and weather. Its fronds are usually only five or six inches long, but monstrous plants fifteen inches or more in height occur in especially favorable sites.

It is somewhat presumptuous to advise people about the culture of plants that don't condescend to grow for you — but few rock gardeners are at all familiar with the Zig-zag Fern's haunts. (Most visiting rock gardeners make a bee-line for timberline in the southern Rockies — missing some of their finest plants in the process.) I would suggest you consider that the lower slopes of the Rockies are rather dry at all seasons (the heaviest precipitation falling in the spring and early summer). Humidity is unheard of and winter

is cold and dry. I don't think, however, that *N. fendleri* can tolerate the heat and dryness that some desert ferns demand since my most successful plants have grown in a rather cool exposure with abundant water during the summer months (but with perfect drainage).

The greatest obstacle to growing the Zig-zag Fern is its fierce resentment of disturbance. It takes several years to recover from transplanting shock no matter how careful you are in moving it. If you finally manage to grow it, I'm sure you will agree that it is one of America's foremost saxatile treasures.

Rock Gardening in Boulder

When I wrote Panayoti Peter Callas in Boulder, Colorado asking him for an article, I also asked what our members were growing in their gardens out there and what the growing conditions were like. My query elicited the following letter which I quote in part:

Our climate in Colorado is by no stretch of the imagination to be viewed as benign. It would be difficult to decide which season, for instance, is the driest. We customarily only have cool, moist spells in late April and May, although we have frequent, short thunderstorms throughout the summer that cool the air a bit, even if they don't wet the soil every afternoon.

Growing a wide spectrum of rock plants is by no means impossible here, however. With fairly frequent irrigation we can grow woodlanders successfully in the shade and ferns happen to be one of my passions. Primulas do well under the same conditions and I am beginning to discover that Asiatic sorts do especially well. All the Sikkimensis Section and the Cortusoides group thrive in moist spots. I also have a good collection of the European alpine species *(Primula allionii* has made it through three winters) and it seems that they really enjoy our dry winters.

Gentians are impossible to fail with here; *G. acaulis* and *verna* varieties bloom prolifically no matter where I plant them and I have quite a collection of other European gentians coming on. I also have quite a few Asiatic gentians *(farreri, sino-ornata* and hybrids) that have proven perfectly winter and summer hardy in my special gentian bed where *Gentiana sino-orn*ata is a terrific runner, layering itself vigorously.

Ericaceae are my sore point. I have a number of cassiopes doing well (but only the toughies), but except for a few of the toughest genera and species all Ericaceae must be planted in areas devoid of winter sun.

Our winters are really exasperating. November, for instance, was windy every day this year with almost constant chinooks, frequently over 100 mph with winds in excess of 40 mph continuing for hours and days on end. *(A chinook is a warm westerly wind that raises the temperature very suddenly. West of the Rockies it is moist; east of*

the Rockies it is very dry and sucks up all moisture. — Ed.) This can really limit one's choice of tall conifers, etc., but it is surprising how little damage it does to alpines. They even seem to enjoy it. We have had no snow at lower elevations this year (compared even to last winter's amazing drought)

The other main groups of alpines — companulas, dianthus and saxifrage, do just as well as gentians and primulas here when planted properly. Kabschias are perfectly safe outdoors in our climate with our dry winters and mild spring spells when they bloom. They bloom much later outdoors than the literature indicates — the earliest open only in March and the blooming season of *S.* x *petraschii* extends into May.

A number of plants do well enough for us here so I am really encouraged. One member, for instance, has a dinner plate sized clump of *Asperula nitida* var. *puberula* that is thriving in the open, and when you can safely grow over a hundred clones of cactus outdoors (as several local gardeners do) with shortias and rhododendrons a stone's throw away, you must have something going for you. Bulbs are especially well suited to our climate and autumn crocus are my special passion in that sphere. This mild winter I have had the last of the autumn species liberally overlapping the earliest winter sorts in bloom. So you see this is a tremendous region, potentially, for rock gardening. The small clutch of rock gardeners here never cease to be amazed at the success of different plants because our climate is supposed to be so difficult, and we really get excited with our every effort. Our principle obstacles are ignorance — 'You can't grow that here,' sort of thing — the lack of material available locally, and the rapidly expanding urban and suburban sprawl. Whole new subdivisions are constantly planned, occupied and planted to bluegrass and petunias. The occupants of these have no way of knowing about rock gardening and rarely have the time or money to spend on landscaping their first years, and by the time they show an interest in g a r d e n i n g , their yards and neighborhoods are committed to growing only the narrowest range of things. Our native soils on the plains are underlain by different sorts of the most impermeable and awful clays (my house is very fortunately situated in this respect) and contractors invariably seem to excavate the very worst "bentonites" (packed adobes) to replace the prairie loams in the yards of new houses. I doubt whether many people interested in gardening make a point of moving to Colorado, but even someone moderately interested in gardening is apt to become discouraged after trying to dig a few spadesful of packed adobe soil.

That, in essence, is our condition. In a region of three million people in the shadow of the Rockies, I am sure that more and more gardeners will become interested in rock gardening as time goes on. Fortunately, our budding organization has a core of at least a dozen enthusiastic gardeners who have had considerable experience in this climate. I believe that as time goes on there will be more and more.

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Panayoti Peter Callas is with the school system tutoring foreign students who have language barriers; Colorado Springs, being a university city as well as the seat of a good many U.S. government agencies, has a good many families in residence from the world around. Panayoti's parents are from Crete and used to send their children back each summer to v i s i t grandparents.

FALL CROCUSES

W. J. HAMILTON JR.
Ithaca, N.Y.

Very few flowers can vie with the crocus for unsullied brilliance, and the autumn bloomers are no exception. Resembling their spring counterparts they differ only in their greater size and the glorious colored stigmatic branches. How much the gardener has missed who knows only the so called Dutch varieties. Showy as these may be, the fat hybrids of *Crocus vernus* cannot match those that flaunt their vases at the other end of the year. There is something serene about their appearance amidst the withering and frost blackened herbs of October. Once you have witnessed a great patch of *Crocus speciosus*, their finely pencilled petals spreading widely and creating a vivid sheet of blue, you will indeed be entranced. Such beauty must not be hoarded but shared with all. Plant where they may be seen and admired, and new friends will come to your door. For all who see these lovely flowers must surely covet them.

Crocus kotschyanus (zonatus) is widely grown and often, with *speciosus*, the only fall blooming crocus offered by garden centers or the small bulb firms. It is usually the first to bloom, the flowers appearing in our borders from September 13 to 24. The first bloom of a fall crocus is anticipated each year and is seldom missed. The beds are searched for the blanched pip a week before it is due. Frequently we fork over the border in early August, for this is a good time to divide and replant the corms. The incipient white spur, formed by the sheathing leaves, will serve to identify both *kotschyanus* and *speciosus* at this season, while other species still retain their dormancy. Even though planted but a year or two, one finds a tremendous increase.

The large slightly flattened corm is distinctive, for the irregular periphery has slight protuberances. Bowles suggested that the wealth of little cormlets arose from these slight irregularities, but close scrutiny reveals that they cluster about the basal plate. The very thin tunic, with its almost indiscernible parallel fibres gives me the impression of baldness. The year's offspring are remarkable for their great number and distinctive appearance. These resemble a wheat grain or a rice krispie in size and color, and will attain flowering size in two or three years. The corms of most species of crocus have a nutty flavor, not unlike that of a chestnut, and one can understand why they are cherished by both the goat herder and his flock.

Once the pip has pierced the earth, a day will suffice to produce the ghostly bud, and another will see the diaphanous soft lavender flower open, the darker veins paralleling the segments and the fulgent throat sporting two distinctive yellow spots at the base of the segments. The anthers are a creamy white, while the style is yellow. Like so many crocus, this species has a rather weak perianth tube that substitutes for the stem. A heavy shower

will beat down the bloom, but others continue to open for several weeks.

A white throated form, *Crocus kotschyanus leucopharynx*, commonly known in the trade as *Crocus karduchorum*, shows its color a bit later. The species is native to southern Europe.

If I were to grow only one fall crocus, *speciosus* would be my choice. It blossoms with *kotschyanus*, but its several fine forms open over a long period. Bluest of all, the handsome cups are veined with an even deeper hue. Even the closed bloom is a delight with its silvery blue sheen, speckled with purple dots. When the blossom fully opens, it will take one's breath with its loveliness, for the great stigmata of scarlet-red forms a striking contrast. The long tube holds it erect for a few days, then the heavy flower will topple over, its prostrate form still attractive. Others will take its place, for a large corm will give a succession of bloom. *C. speciosus* is more widely grown than all other fall blooming species. In good supply and reasonably cheap, it should be planted in quantity. One's initial purchase will pay rich dividends, for it increases rapidly, both by the abundant seed and the proliferation of countless cormlets each year.

The corm differs markedly from those of *kotschyanus*, being distinguished by the annulate rings that girdle the lower third of the corm. These are readily sloughed off by one's fingers.

Of the several forms that we grow, *C.s.* 'Aitchisonii' is our favorite. Flowering a week or two after *speciosus*, it is paler blue and a good bit larger, some of our flowers measuring fully four inches across when fully expanded. The blossoms open in mid-October and continue flowering well into November. *C.s.* 'Cassiope' is another large flowered form of pure aniline blue and a yellow base. 'Artabir' has broad inner petals of bluish white with methyl blue lines, while the outer segments are a much deeper blue. 'Oxonian' is a superb flower, its deep violet blue globe flowering later than all other forms of *speciosus*. It is not often offered, and how I wish that I had bought more than the half dozen corms that were offered for 30 cents each back in 1960. It blooms in November—sometimes! Several years may pass without a flower. Where all these forms are grown together, they hybridize freely. The later they are to bloom, the less likely the flowers will be fertilized, for bees and other pollinators are not often abroad in November, when the garden is growing dank and cold.

The season of bloom may be extended if one delays planting, and the purveyors of bulbs may unwittingly favor us in this matter. Thus a late shipment of *speciosus*, received and planted in mid-October, may flower until late November and with the last colchicums, prolong the season measurably.

Forty years have passed since I bought a handful of *Crocus sativus* corms, first of the fall bloomers I was to try. I had read many accounts of the fabled Saffron Crocus, mentioned in the Song of Solomon and long renowned for its use as a dye, a perfume and a drug that reputedly cured all the ills man is heir to. As my children watched the planting of these precious corms, I told them the story of this fabled plant, how it had been praised by the Greek writers, presumably brought to England by the Romans, how the Middle Ages had their saffron inspectors and of the unfortunate Findeker who was burnt to death for adulterating his saffron. All these and other tales did I tell, and as visitors came to view our earliest fall crocuses and

colchicums, I repeated the stories, cajoling them to return in a week to view the gorgeous and historic bloom that was soon to open. A few did return, to be treated only to clumps of long, narrow grass-like leaves of a gray green color, but not a sight of the glory I had promised. Perhaps, I thought, the corms needed an additional baking, so the following year I dug them in late May, placed some in a paper sack hung in the cellar and buried others in a pail of dry sand. All were replanted in late August. A little well rotted manure was mixed in the soil, as the British saffron growers had done in years gone by. This effort was rewarded with a single bud, devoured by slugs before the glorious stigma could unfold. I had little reward with this species over the years.

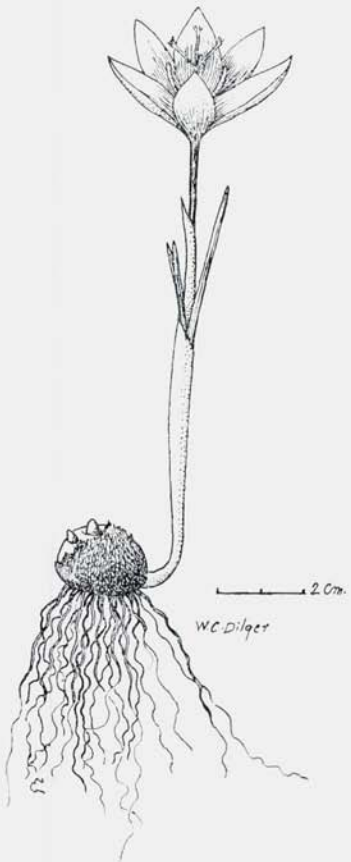
Then in early October of 1975 I visited Whit Reynolds, a fellow ARGS member who gardens on damp rich but well drained soil a few feet above the level of Cayuga Lake. He was anxious for me to see the growth of some dwarf conifers I had given him that spring. And there grew in all their marvellous colors — *Crocus sativus*. In utter disbelief, I counted ten large clumps of the great chalices, their bright reddish lilac suffused with purple at the base and veined in yet deeper purple. The flaming stigma, with its flattened branches, flopped over the widely expanded petals. Once *sativus* spreads its gorgeous petals, they remain open, subject to storms and foul weather. But these clumps were so crowded that the flowers held one another upright. When I asked where he had obtained the corms, Whit replied that he had bought them at the local Agway garden store several years past. Knowing of my interest in crocus, Whit urged me to take the lot, for, as to so many others, he remarked, "Crocus are spring flowers and that is when I want to see them." The corms were eight inches deep, well below the level at which they had been planted. I set them out at this depth, incorporating a quantity of sharp sand in the holes. That very night a rabbit ate most of the long leaves; rabbits seem to be attracted to new plantings. The plants were covered with chicken wire and the leaves grew out in a matter of days. And they did bloom well the following year. Possibly we now possess a good flowering clone. Perhaps we may even have a few cormlets to spare in the years ahead. Alas, the cultivated saffron crocus is almost always sterile.

The variety *C.s. cartwrightianus* is a small edition of *C. sativus* and is said to be delightfully free with its bloom, but the few I have planted have been disappointing. Another variety from Kashmir is likewise reported to flower well, while the white form with blood red stigma is cherished by the few who can afford the high priced corms. The Saffron Crocus presumably likes a fairly rich soil, frequent dividing and a thorough baking during most of the summer. Given these requisites, one can hope for some niggardly bloom.

Even though you should meet with some success, don't plan on growing *Crocus sativus* for retirement income. The chain grocery stores ask $3.60 for an eighth ounce of Spanish saffron. It requires the stigma from nearly 500 flowers to approximate this amount. Be mindful that the Saffron Crocus has a paucity of bloom under any circumstances in the northeastern states.

Crocus medius, flowering in mid-October, is one of the loveliest of the lot. The deep lilac purple bloom has an indistinct throat patch of radiating purple lines, a trifle darker than the

rest of the flower. The showy orange red style, finely divided, contrasts delightfully with the rest of the bloom. The illustration, drawn by Dr. Bill Dilger, is made from part of a clump dug from the frozen ground on January 5. It had continued to bloom well after its normal period because of a protective plastic dome that was shielding it from continuing snowfalls. Note the long perianth tube, characteristic of most crocuses, which serves as a stem for the flower. Occasionally the tube arises from near the basal part of the corm, rather than from its center. The corm tunic is finely reticulate and the long roots are at least four times the depth of the corm, a fact one must be mindful of when preparing the bulb bed.



Crocus medius

Perhaps crocuses behave differently in England, for in the Bowles garden it was reported to be leafless at flowering time, while in our garden the short stiff leaves help to support the perianth tube. But this is no occasion for surprise, for the habits of plants and animals cannot be stereotyped. In the Northeast, the brown trout is an October spawner, while in the upper reaches of the Seine, I have watched them on the redds in February.

The medium-sized corm of *C. medius* increases well if given a sunny spot in sandy loam. While it is native to the hills above the Italian Riviera, it is not lacking in hardiness. Two or three corms soon form a sizeable clump.

Crocus ochroleucus is native to Palestine and Syria. The creamy white flowers have an orange base, white anthers and orange filaments. The flower is small and held on a rather longish frail tube. While perfectly hardy, and blooming well into November, and often much later, it is a fragile species and is quickly beaten down by autumnal gales and rains. For years I have grown this crocus in the open, but am no longer content to trust to the vagaries of the weather. Grown in a covered frame with other choice forms, we have had bloom persist into mid-December. It is said to increase rapidly from a wealth of cormlets, but my plants have not demonstrated this prodigality.

Crocus longiflorus appears with its leaves in late October. It has deep lilac purple flowers with rich orange yellow throat and scarlet stigma. Formerly known as *odorus*, even I can catch its fragrance. Roy Genders likens its scent to ripe plums, while Bowles would

have his readers bring a few blooms into the house to remind them of primroses and iris and the coming of spring. The flowers do splendidly in our hostile clime, far removed from the sunny hills of Malta and Sicily which they claim as home.

I grow *Crocus salzmannii* because it is available and does well in my garden. Native to southern Spain and North Africa, the pale lilac flower with yellow throat, yellow anthers and much divided orange style flowers in October. The bloom has a rather flimsy texture. A tuft of long grassy leaves precedes the flower. Mine are growing between paving stones and are thus partially secured from mice, which are said to favor the very large corms.

Crocus pulchellus is a vigorous doer. I have owned it but four years, but in that time it has well repaid the high price of its corms. Close kin to *speciosus*, it differs in its rich orange colored throat and pure white anthers. The inner segments are marked with several dark purple lines and a ring of orange blots at the base of each segment. The handsome white cultivar is seldom offered in the trade. Native to Greece, Turkey and Asia Minor, it presumably is an abundant species in the wild but is seldom listed in catalogs. But this robust species increases well, and provides us with a welcome crop of seeds.

We have a few others to keep company with those listed above. *Crocus goulimyi*, described as recently as 1955, forms a little lavender globe on a five inch perianth tube. The anthers and style are a pale sulphur. Mine are grown in a whiskey barrel half, to permit closer scrutiny. In the same tub, several corms of the unique *Crocus nudiflorus* have been planted. From the rather small corm, underground stolons are formed, producing small corms at their ends. The dark deep purple flowers have attractive orange stigmata. This one requires patience, for a year may elapse after planting before one is treated to the flower. It is reported to be common in the Pyrenees. Bowles remarked on its abundance, stating that in the Basses-Pyrenees and even about Biarritz, it is almost impossible to dig up any plant in any spot at any time of the year without obtaining a plentiful supply of the small corms of this species. Why then must I search long for a source, then pay two to four dollars a corm, depending on the demands of the importer. Another expensive beauty is *Crocus banaticus*, whose distinctive segments are more like the standards and falls of a miniature iris. The slightly reflexed outer petals are twice the length of the inner ones, of a warm purple hue that contrasts well with the pointed lavender inner ones. The thready lilac stigmatas are quite unlike those of any other crocus I have seen. My single corm grows in a shaded trough, as this Romanian species seems to prefer moist meadows and open woodlands. The unusually broad dark shining leaves appear in late spring, another feature which serves to distinguish it from most of its allies. A half milk carton in the frame harbors a dozen two-year-old corms, so we may have several flowers another year. Do not overlook *Crocus laevigatus*, a little beauty that may persist into the new year. It is best grown in a covered frame, for snow frequently buries its handsome flowers.

There are others to brighten the stark earth of the passing year, but the species listed above should provide the incipient crocus buff with a good start. We cannot hope to emulate the great E. A. Bowles nor his friends Anderson, Elwes, Farrer, Dean Herbert, Maw and their likes, but surely we can profit

from their writings based so well on long experience. The great lists of a century past are but memories. Even in the past quarter century, the offerata shows a yearly decline. A decade past, one Massachusetts firm listed a dozen fall bloomers and 59 winter flowering species and their varieties. The same broker offered only six fall bloomers and ten winter flowering forms in 1976. British firms offer us a wider choice. Twenty-one fall bloomers are listed by an advertiser in our Bulletin. There is no longer a problem in importing most bulbs and corms from abroad. Many, including crocus, are not subject to inspection, nor is an import permit (cyclamens excepted) required. My friends and I are well satisfied with British importations. We are not happy with our treatment by some American firms, who exhort us to order early, then delay their shipment until the ground is frozen, when the cold earth must militate against root development.

If your purse strings are tight, and must forego the purchase of corms, there is yet another way to stock your borders. Seed is usually not offered by commercial houses, but the seed exchanges offer a splendid source of supply. In the past ten years, the ARGS seed lists have posted an average of 23 species and varieties of crocus annually, while the Alpine Garden Society, over the same period, has bettered us by listing an average of 58 species and their varieties over the same period. The Scottish Rock Garden Club also outdoes us in this respect. Crocus seed is always in demand, and the less common species seem always in short supply. Start with your own seed, or beg a few from a more fortunate gardener.

When one learns that flowering sized corms are not to be had for four or five years after sowing, he or she may despair. But if those of us in our seventies can plant seed regularly, knowing we may never see the fruition of our efforts, then surely you youngsters in middle life should not delay. Often the only manner in which a rare bulb or corm may be obtained is from seed. To be sure, a year may elapse before germination occurs, but if one makes a start, it is but a short time before new treasures are appearing annually.

One may expect a packet of seed from the exchange in February, perhaps earlier. The seed should be planted on receipt. Crocus seed require no chilling, but they do respend to a 24 hour soaking which surely speeds germination. A fibre glass window box or any similar container, provided with adequate drainage holes, is filled a quarter of its depth with broken crocks, cinders or large grit, then levelled off with equal parts of porous soil (composted sod), sharp sand or chick grit, and peat moss. The seeds are planted at a depth of one half inch, in alternate rows with snowflakes, scillas, muscari, ornithogalums, etc. We start our seed on a sun porch which has a winter night temperature of 48-55°F. and day temperatures of 60-75°F. depending on the amount of sunshine, which is a very scarce item in Ithaca during the winter months. *Crocus goulimyi* has germinated in 33 days, while other species are somewhat slower. The foliage may persist for two or three months. When it dies down, the tiny corms are spooned out into a saucer, then planted in half-gallon milk cartons. These are prepared by removing the lower half with a single edge razor blade, then cutting two triangular holes in the bottom for drainage. Screening is fitted into the bottom (fine meshed hardware cloth will do) and provided with drainage material to a third its depth. The cormlets are planted half-inch deep in the same mixture as they

were started in, and the cartons placed close together in a frame, which is covered with half-inch chicken wire to exclude varmints. Two years ago, we started planting the seed directly in the cartons. These containers last for two years, when the small corms will have drawn themselves toward the bottom of the container. Now the size of a pea, or often larger, they go into permanent quarters, where one may expect bloom in a year or two.

If one is to collect his own seed, close watch of the swelling seed pod must be kept in late May or early June. The ovary is just above the corm, but as seed maturation approaches, the stalk under the ovary has pushed it to the surface and the large brown seed capsule appears. The seeds are large and readily recovered just prior to dehiscing. Some species have strikingly colored seed, glowing like little rubies when fresh. It is well to plant as soon as collected, but as indicated above, storage does not inhibit germination.

Many crocus are native to the Mediterranean area and the Middle East, where the earth receives a thorough baking during a rather long dry season. Thus quite a few species profit from being grown in a frame which can be covered with glass, or better, a sheet of plexiglass or acrylic plastic. The latter can be cut to any desired size, is lightweight and completely transparent and will not discolor even after years of exposure to sun and water. I usually make the flat topped frame of a size to match the sheet of plastic glass. It can be knocked together of weathered boards six to eight inches wide. Site it so that optimal sunlight may be had. A frame measuring only two by three feet will easily accommodate two hundred or more corms. A layer of coarse sand, cinders or rubble should fill the excavated site to a depth of several inches. If the soil is heavy, it is well to elevate the frame so that it sits a few inches above ground level. Oak whiskey barrels, sawn through the middle, and properly fitted with adequate drainage holes, make excellent tubs for growing crocuses. These are filled two-thirds full with stones, broken bricks or cinders, then a good mixture of light soil added to provide a growing bed of eight or ten inches. This permits good drainage and a proper summer baking for those that require such treatment.

The late E. B. Anderson provided good counsel for those who would have success with these mid-east species. He stated that most bulbs and corms are starting to rest when other rock plants are in full growth and in need of water, which is just what most bulbs do not want at this stage. He recommended a raised bed, six inches high, built about small deciduous trees, such as *Prunus* or *Malus*. These will serve as a water pump, the roots taking up any excess moisture. With the fall of the leaves in autumn, the moisture needed for flowering is then available to the crocus. A dry wall serves equally well, the bulbs or corms being planted on top of the wall. This is also a good site to plant *Iris danfordiae*. Search the countryside for old lichen-covered stone walls for your raised beds. these are attractive and add greatly to the appearance of your garden.

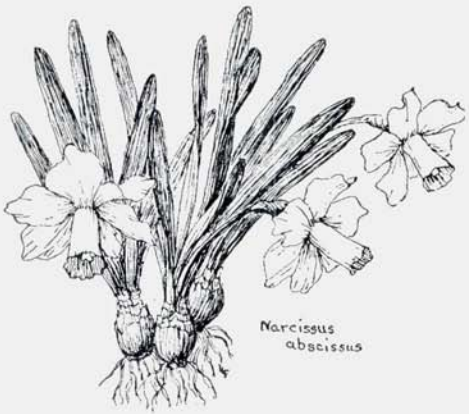
Shall we use a ground cover to protect the crocus flowers from the late storms of the year? Farrer would have us plant the corms "under a carpet of something else, not only for the protection of the crocus bloom itself, but also that the something else may have its hour of glory when the crocus is no more". He urges a cover of *Arenaria, Cotula, Acaena, Veronica re-*

pens and others as being admirable carpets to associate with crocus for the mutual benefit of both.

We must again be reminded that most crocus enjoy a good baking in their resting period; if they are to be topped by a spring or summer cover that requires water, then its purpose will be defeated. Such green ground covers all too often harbor slugs, which are inordinately fond of the crocus flower. If one must 'mulch', select a plant that is reasonably open and can manage without recourse to the hose. *Sedum coeruleum* is such a plant. The starry blue flowers persist for weeks. Some of our crocus have seeded under semi-prostrate cotoneasters, the branches helping to support the flowering tube and forming an attractive foil which is too open to shelter slugs.

Crocus are remarkably free of disease and have few insect pests. They suffer from that implacable hoarder, the chipmunk. *Tamias* will uncover the choicest corms, leaving nothing but the shredded tunics. Cottontails are equally destructive, for they often defoliate the plants which results in a weakened flower bud or none at all in the coming year. Mice and slugs are equally destructive, and even birds seem to delight in tearing apart the newly opened flowers. So guard against these pests and plant enough for them and for your own pleasure.

Finally, place an order immediately you receive a catalog, for they should be gotten in the ground in August if you are to enjoy them the same year.



As you go around the garden this spring admiring the newly sprung bulbs and greening buns and carpets, keep an eye open for the unwanted seedlings of trees and shrubs and yank them out summarily. The green propellers of sprouting maple keys and the unfurling leaves of seedlings that managed to attain a foothold last year show up well before the herbaceous plants have a chance to rise up and conceal them and they are easier to haul out before their roots delve deep.

A WOODLAND ARISTOCRAT

MRS. RALPH CANNON
Chicago Illinois

Every woodlander should grow a colony of *Helleborus orientalis*, commonly known as Lenten Roses, somewhere in their woods. They are a member of the Buttercup Family *(Ranunculaceae)*. Though neither new nor rare they are remarkably beautiful and easy to grow. These plants are not indigenous to our American woodlands but a prudent woodlander is always looking for a wonderful new plant to naturalize. I became interested when a friend from England sent me six hybrid plants and I began to study this genus and found that my interest turned to sheer fascination.Among the hybrids were: *H.* 'Petsamo', with white cups; *H.* 'Prince Rupert', white cups spotted with maroon and *H.* 'Nancy Smith', purple cups. I now have three large colonies growing in different areas, each colony being more than a yard square and all grown from seed.

It is said that *H. orientalis* traveled from Turkey, Greece and Asia Minor to England and from England to the U.S.A. They definitely are ideal for woodlands provided that they are shadowed by taller plants or the high shade of trees and that their physiological nutritional demands are met. These plants have a tolerance for shade that few other plants have and few woodlands exist where conditions favorable for growth does not already exist. They revel in leaf mold and like a fairly heavy loam and moisture. In favored places they may reach two feet in height. The foliage is very distinctive: strong, leathery, palmate leaves, deeply cut or divided into seven segments or lobes, coarsely toothed at the edges and dark, shiny green in color. This makes them very handsome, sturdy and Gothic throughout the growing season. When the gloom of winter is still with us the flowers of the Lenten Roses begin to appear. In early April when most of other plants are sleeping, it is marvelous to walk in the woods, all bundled up, and find the Helleborus trying to push its blossoms up for view and give a charming foretaste of delights to come. Along with the snowdrops they may be called the heralds of spring. As they bloom so early the blossoms can be laid flat with frost or snow but will rise again when mild temperatures return and come through without suffering. Several nodding flowers are carried on each ten to twelve inch stem and are markedly decorative. The showy part of the bloom is the petaloid caylx which remains fresh looking on the plants for a long time although toward the end they become greenish in color. The cups are two to three inches in diameter and substantial in texture. In the center curious tubular nectaries, which are modified true petals, stand just behind the cream colored stamens. These in turn are clustered round the prominent horn-like green stigmas. A mixed colony will show a wide range of colors, from white to off-white, cream, rose, lilac or purple and sometimes may be spotted or blotched with other colors. I have never had a yellow one. As a cut flower they are not reliable. You may be successful if you cut them in bud, split the stems and plunge the tip of the stalk into nearly boiling water for a minute or so. If successful, they will

last a long time in the vase.

These plants do not like to be disturbed and therefore resist transplanting, so plant them where they will remain. If the plants have to be moved do so right after flowering. One-year-old seedlings are more easily moved.

Since plants are expensive, this should inspire raising them from seed. Growing them from seed can be fascinating and will add to the size of your colony as well as providing an element of surprise when they bloom. My batches of seedlings have been from open-pollinated seeds. A colony of a dozen or so plants makes a beautiful planting, for their spectacular foliage is striking and of lasting interest. Seeds become ripe the latter part of June. They will be found in the three horns in the center of the old bloom and the capsule must be gathered before they dehisce and shed their seed. Generally a heavy crop of seed is produced. Plant the seed at once using standard techniques and wait until the following spring for germination. Cover the planting with dead leaves which will protect them from being washed away by rain. These seedlings will produce flowers in three to four years. Instead of relying on seeds, if new plants are bought, you will have to wait a couple of years before they flower but once established they will improve year after year.

After *H. orientalis* is happily established they will thrive without any attention. They are long-lived and need no cultivation and will flourish and flower every spring. Just leave them and enjoy them. They are self-contained and self-sufficient plants. If you do not gather the seeds for increasing your colony, you will find self-sown seedlings, possibly a new hybrid. I have never seen any damage by mice or slugs on any of the plants. Their tolerance to severe winter conditions of —20°F. confirms their hardiness and they will remain semi-evergreen if a few evergreen boughs are thrown over them after the ground freezes. If the extent of the woodland allows one to indulge in such luxuries as these Lenten Roses, it is indeed fortunate. Because these perennial plants are remarkable, beautiful and rewarding in any woodland setting and require no dividing, no staking or cultivation, in fact no work after they are established, they warrant consideration for naturalization by all true woodlanders everywhere.

Love, knowledge, and plants are never lost in the giving and frequently, like bread crumbs scattered on the waters, are returned a thousand fold. How often we have given away a division or cutting or a pinch of seed to a friend only to beg back a new start of that same plant after it has vanished, alas, from our own garden? How many unusual clones of inestimable value have been lost to cultivation because the finder wished to be the only one who grew it? Yet how many now grace our gardens because a unique find was propagated and generously shared.

Book Reviews

Handbook on American Gardens, *Brooklyn Botanic Garden Record*, Plants and Gardens, Vol. 26, No. 3, Revised Printing, 1977, 87 pp.; Brooklyn Botanic Garden, 1000 Washington Ave., Brooklyn, N.Y., 11225.

Broadly speaking, those who are unacquainted with the *Brooklyn Botanic Garden Record* series of Handbooks, entitled "Plants and Gardens" are missing a collection of most useful reference materials extending over many years. These Handbooks are basic, they are specific, they are essentially for the layman; they are in layman's language but, as one would expect and as may be needful, they are also technically accurate; and where editorial judgment dictates technical terminology, they do not shun the technical. All together in their more than fifty titles currently available, they cover probably as broad a spectrum of horticultural interests and subject matter as one is likely to find published under one roof anywhere on this continent. While, perforce, they give due attention to the Garden's parish, they are by no means parochial. As is well known, the Garden's world of horticulture is world-wide; its publications accordingly embrace substantial leagues of square miles of our earthly sphere.

The immediate concern of the Handbook under review is the broad expanses of this land of ours and of our good neighbor to the north. To quote from the Editor's introductory statements:

> "The 250 gardens which are described in this Handbook are a varied group. The majority are botanic . . . gardens or arboreta, while some are estate or plantation gardens, and a few are nature preserves. Still others are commercial enterprises. They range in size from one-quarter to 10,000 acres. All of them, regardless of their diverse origins, are places of beauty and harmony in a changing environment."

As its subtitle states, this Handbook is in fact a Traveler's Guide. There are entries for 48 of the States plus the District of Columbia, and the Virgin Islands (missing: Wyoming, Alaska and Puerto Rico). There are entries for each of the Provinces of Canada except the Yukon and Northwest Territories and their associated arctic realms. In short, wherever a mobile populace can go on wheels here is a storehouse of concisely stated data on what travelers in pursuit of horticultural interests may find when they get there.

Any such compilation is necessarily selective; you'll not find, for instance, directions to Wyoming's Medicine Wheel (Thanks be, but see ARGS *Bulletin*, Vol. 29, No. 3, p. 81); but you will find:

Item: Routings to and details about (including open hours, admission

charges, etc.) such spots as Coral Gables' *Fairchild Tropical Garden*, with its "Montgomery Palmetum" (Conn. members note, please, the Montgomery Pinetum in Greenwich — not listed under Conn., true, but no matter: it's the same Montgomery, and so is *Picea pungens glauca* 'Montgomery'). We are reminded that the Fairchild Garden also holds a palm glade in cherished memory of Liberty Hyde Bailey and — note please — attention is also called to a rock garden within the bounds. (Should be interesting indeed, and an inducement and spur to our southern members.)

Item: In case you missed the exhibit in Seattle in 1976, you will find for future inspection reference to the genus *Nothofagus* — the beeches of the Southern Hemisphere scarcely known in this country, but visible in the University of Washington Arboretum.

Item: Rock gardening and herb gardening need not be wholly alien one from the other. Did you, when at our Annual Meeting in Milwaukee '73, see in the Boerner Gardens one of the country's largest collections of herbs? If not, you will find directions to help you retrace your steps.

Item: The entries for Pennsylvania reveal a bewildering number of gardens missed in the Philadelphia area when we foregathered in spring, 1977 at Valley Forge. Some of those may well become objectives for later trips.

Item: What is one to say of California? For those burdened with but limited vacation time, the only recourse is to fly and to hire a car on arrival. Then with this Handbook in one hand and road maps within reach, start at one end of the State and zig-zag toward the other among the two dozen entries.

Item: If, with forethought and more time, you gathered in from California's State Chamber of Commerce (the Handbook lists State and Provincial Tourist Information Bureaus, with addresses) assorted brochures, maps, etc., you could indulge in a "garden-hopping binge" of major proportions up and down the State. (That you might return home to find your job gone and your garden irretrievably lost in weeds and underbrush might be a small price to pay — if you're *that* dedicated.)

So much for samples.

For a horticultural "bus-man's holiday", this Handbook and, as a companion volume, the *Guide to Public Gardens* issued by the Garden Club of America (see ARGS *Bulletin*, Vol. 35, No. 2, p. 98) will, together or separately, enhance your travels materially. Between these two, one can hardly escape some overlapping of places listed, but that is of little import, for in many particulars the two complement each other, and you'll be the gainer. Both are modestly priced and of convenient pocket-size. Don't leave home without them.

Milton S. Mulloy

Gardens in Winter. Elizabeth Lawrence. Claitor's Publishing Division, P.O. Box 3333, Baton Rouge, Louisiana 70821

In the year of its first publication, 1961, *Gardens in Winter* by Elizabeth Lawrence was reviewed in the ARGS Bulletin, wherein it was described as "the product of a prodigious amount of experience and research". Further, the author's style was deemed reminiscent of that of Reginald Farrer and Gertrude Jekyll.

Now sixteen years later *Gardens in Winter* is re-issued with 16 additional pages to record additional notes gathered in during those years. Miss Lawrence cherishes and nurtures gardening friends all across the country and with their help she depicts winter gardens under climatic conditions widely differing from her own in Charlotte, North Carolina.

Miss Lawrence received the William Herbert Medal from the American Amaryllis (now Plant Life) Society in 1943 and the ARGS Award of Merit in 1972. Several of her articles on native irids, autumn-flowering bulbs and other topics may be found in the 1940 and '50 numbers of the Bulletin.

Caroline Dorman's drawings enhance *Gardens in Winter* and there is much of her gardening experience in Louisiana as reported to Miss Lawrence also included in its pages. I am happy to note that Dr. Dorman's own books *Flowers Native to the Deep South* and *Natives Preferred* are available from the same publisher, Claitor's.

B.H.

• • • *of Cabbages and Kings* • • •

First, I would like to thank all those who so gallantly and immediately answered my pleas for articles; without their instant and generous response neither this issue of the Bulletin nor the last could have been gotten out to the membership as swiftly as they have been.

Though I have had a little previous experience as an editor (helping Linc with his books and articles and working for our local newspaper), these past few months have been an education for me. If I remember accurately there was at one time in a national magazine a column called "The Editor's Easy Chair." It contained the fine flower of the editor's private ruminations and one visualized him, slipper-clad, lounging back in his cushioned chair, thinking deep thoughts. But if, indeed, this flow of philosophic prose was the product of the real editor, I'm sure he had to find a surrogate to get out the rest of the magazine. I have discovered that being the editor of a publication such as the Bulletin is not precisely conducive to thinking deep thoughts while relaxing in an easy chair. Most of what will appear in this column will be material supplied by others. I have, however, ruminated to a considerable extent over the problem of what the Bulletin represents and what its readers expect it to be.

Magazines come and go, rise and fall, change their format and their content. In the last issue of the ARGS Bulletin, there was a slight change in format; in lieu of the wonted full page-width line of type there is now a two column set-up. The size of type remains the same; it is still ten-point, though we did toy with the idea, partly for our own comfort in proof reading, of going to a slightly larger twelve-point typeface. I have been assured that the short line in the two column format

is easier to read than the longer page-width line, perhaps you agree. It has an additional benefit in that it allows for greater flexibility in picture size; in many cases a narrower than full page width is better suited to the subject matter than is the full page spread.

Because of our commitment to the present printer, the Bulletin is printed by letter press. This means that all pictures have to be made into either line cuts or, in the case of photographs, half-tone plates at some expense per square inch and, if the only illustrations available are color slides, these have to be first converted to black and white prints. Each step is expensive and during each step something is lost in clarity. Line drawings reproduce better than even black and white photographs and both are better than slides.

From time to time the question of color pictures in the Bulletin has been mooted. This has been looked into but the cost would be prohibitive — and is it really necessary? It is true that over the years most magazines having a general circulation and even a few of the more specialized publications have gone in for page after glossy page of color photography. In a few cases the results are stunning, but in some the reproduction is smeary and off color and in certain cases the stress on full color illustrations has been accompanied by a lessening in the quantity and even in the quality of the reading matter. Perhaps this over-riding belief in the value of full color pictures results from television or Mr. McLuhan's statement (probably misinterpreted) that the medium is the message. We have been led to believe that we have become a nation of non-readers. But I believe that *our* members, at least, can read and, indeed, enjoy reading about plants and gardens and landscapes and the people that have to do with them. Could a picture interpret the humor in Wayne Roderick's article in this issue and the personality of the early plant explorers about whom he writes? Could a picture or even a series of pictures describe as accurately the needs of a specific plant as do growing instructions given in a few concise words?

But of what should the written content of the Bulletin consist? Some horticultural publications have gone in almost exclusively for technical articles, at times in a scientific jargon so dense as to be almost un-understandable except among the elect; others have concentrated on instructions for the beginner, with the result that the same subject matter is covered yearly over and over again. Yet others have filled their pages with the activities of the society: committee reports, lists of plant-show winners, program notes and, in a few cases, cosy accounts of local get-togethers including a description of the tempting goodies supplied by the refreshment committee.

Except for a few reprinted articles, the members of a society such as ours are the sole source of the material that appears in their publication. The editor can beg for articles. He cannot commission them nor can he offer to pay. Therefore to a very large extent the magazine depends on what turns up. We are, perhaps, more fortunate in this respect than some other specialist societies. Our field is not a narrow one concerned with but a single plant family or genus, nor need we be concerned with everything that grows as are the botanical gardens which must consider the whole world of plants from the arctic to the tropics to the home vegetable plot.

Our subject matter is sufficiently restricted to be comfortably encompassed within the pages of our Bulletin, yet

wide enough to be the source of many and varied articles, some of which should please most of our readers most of the time.

An Unusual Opportunity

Frank Cabot, our treasurer, sends in this suggestion for a "working" vacation for an alpine enthusiast:

The Giardino Alpino "Paradisia" is located at 1700 meters (5600 ft.) at the foot of the Gran Paradiso Massif (4061 meters or 13,323 ft.) in Valnontey at the upper end of the Cogne Valley which lies directly to the south of Aosta in the heart of the Graian Alps in northern Italy.

"Paradisia" has been in existence for some fifteen years and the setting for the alpine garden, which is part of the Parco Nazionale Gran Paradiso, is incomparable with its backdrop of everlasting snow and steep valley sides strewn with lichen covered boulders that lead down and form the framework of the garden.

Silvio Stefenelli, the Director of the garden, is a highly sympathetic, self-taught, diligent horticulturist who, in addition to running an alpine botanic garden, herbarium and *index seminum*, is engaged in mapping the flora of the region and conducting cultural experiments on endemic plants with economic potential, such as the genus *Artemisia* which flavors a variety of potent liqueurs made in the region. Mr. Stefenelli spends the entire year in the valley (moving a few miles down the road to Cogne in mid-winter so that his children can get to school) and lives in a charming alpine chalet that adjoins the garden. Over the years he has built up a fine herbarium of native plants.

The garden has had several directors in its short life, each of whom approached it with a different point of view. As a result, it is in need of reorganization, especially some of its beds (which are examples of what Farrer categorized as "Dog's Graves" and "Almond Puddings",) so that they will blend more readily into the landscape. The problem is that Mr. Stefenelli and his staff have their hands full carrying out their mission and are unable to cope with the reorganization *and* the weeding *and* the 60,000 summer visitors at the same time.

There is an opportunity here for a small number of rock gardeners (spread throughout the May 15-October 15 season at the rate of one or two individuals at a time) to exchange board and lodging in one of the most dramatic of alpine valleys for highly satisfying work in an alpine garden where plants that lowlanders struggle over flourish and abound. The individuals who pursue this opportunity should be experienced gardeners with a demonstrated talent for rock work that is considered aesthetically satisfying to their peers. A familiarity with Italian or French or German would also come in handy.

While much of the time would be spent in working in the garden there would, of course, be opportunities to explore the surrounding heights and valleys and to enjoy the glorious flora of the Graian Alps and the ibex that abound in the National Park. Masses of *Androsace vandellii (imbricata)* grow on cliffs within an hour's walk, *Saxifraga tombeanensis* is found up one valley, *Saxifraga caesia* and *diapensioides* up another. The alpine turf is a carpet of *Pulsatilla*, *Androsace carnea* and *Gentiana verna* and, of course, *Paradisia liliastrum*.

Those who have what it takes and who like the idea of this particular "stairway to Paradise" should write Silvio Stefenelli, Giardino Alpino

"Paradisia", Valnontey, 11012 Cogne (Aosta), Italia.

Androsace Chamaejasme

Harold Siebert, of Stony Plains, Alberta, Canada sends in the following vignette on *Androsace chamaejasme*. The accompanying delightful drawing is by Linda Chabun who works in his greenhouses:

This little gem is one of my favorites. It is a native of Alberta and a happy resident in my alpine house. In winter the plant is inactive (I keep the temperature at 35°F.) and the deep green rosettes, about the size of a nickel, remind me of webby sempervivums. I have to be careful not to overwater in winter because they are susceptible to powdery mildew.

In the alpine house they will come into flower about April: fragrant, creamy flowers with a dark orange eye, tiny, the size of your little fingernail, very much like those of *Androsace lanuginosa* in appearance, but the heads are borne on the top of rigid, two inch stems.

A. chamaejasme multiplies slowly by underground stolons, and I use my standard alpine mix* to grow it in. Fresh seed germinates easily and the plants are fairly generous with seed.

My original plant was given to me by a friend and plant enthusiast who collected it on one of his trips. *A. chamaejasme* can be found in the open field but is more likely to inhabit the edge of woods.

I am always charmed by this plant no matter what time of year, and when it is in bloom it calls me down to it for just one more delightful sniff before going to the house.

*Secret Soil Mix

Some of you may already have a favorite soil mixture but others may be floundering, wondering which plant likes what. My mixture for most alpines except the ericas is as follows:

1 part topsoil (preferably from a good farm)

1 part sphagnum peat (from a natural peat bed, although the baled stuff will do in a pinch)

1 part washed sand (not fill sand)

1 part mushroom compost (This is beautiful. I get mine from a mushroom farm nearby. You could substitute well rotted manure or aged compost instead.)

For ericas I just triple the peat.

Dwarf Alders

This interesting report of an unusual find is from Edith Dusek of Graham, Washington:

Finding young alders (*Alnus rubra)* in the Pacific Northwest is nothing noteworthy. Each newly shorn bit of ground quickly develops a coat of them competing so fiercely for life that in three years time it can be nearly impossible to push one's way through them. Understandably any alder babe that is indiscreet enough to appear in the gardens gets short shrift.

Several years ago my fingers were flying from one unwanted bit of greenery to the next when a young

alder, no more than a few inches high, had the temerity to break off rather than pull out as they usually do. Perhaps this is what called my attention to it, perhaps not. At any rate, at that particular moment I hadn't a tool handy with which to evict the remainder and, being in my customary hurry, I passed it by with a promise to give it its come-uppance during the next session of weeding. Still, something nagged about that pesky alder. For its height it must have had an unusual supply of roots to tack it to the ground with such determination. Normally seedling alders have one or, at most, a few chunky stems, large buds, a few large leaves and not too many roots. This one had numerous wispy stems with small buds and leaves about the size of a nickel. Oh well, I thought, just a starveling — or was it? Subsequent checks disclosed that the undaunted little alder had put out fresh twigs and leaves, but instead of throwing out one stout main branch with which to be on with the business of living, it remained low and twiggy. I let it be, why I do not know, for alders rate high on my list of least favorite trees.

A couple of years later, our son became engrossed with bonsai and his enthusiasm was contagious. My fingers itched to try shaping something — anything. Aha! That scruffy little alder was just the thing for a novice to use as a practice tree. There it was, still no more than a foot tall though by my calculations it should have been closer to fifteen feet. Once dug and potted it was a rather interesting looking affair with numerous short, threadlike branches held stiffly erect, something after the fashion of a Lombardy Popular. My attempts at shaping it could not have been too much amiss for at last the puny little misfit caught my son's eye. He now has it in a proper bonsai dish and quite a fetching creation it is.

Whether or not my eye has been sharpened so that it has become more aware of small things that are unusual, I do not know, but shortly thereafter another of these runty alders with pint sized leaves was found. The following year we spotted two more. They were dug and potted. Misfortune in the shape of a playful kitten ended the career of one. It was then decided to plant the other two in a frame of rich dirt to see if this would cause them to revert to type. They showed their appreciation by producing somewhat larger, though far from normal, leaves. Though they looked prosperous by the end of the season, one was less than a foot tall while the other scarcely made ten inches. This fall's cleanup produced yet one more of these curiously small alders, this one about three inches high or near it, among quite normal brethren, and several even more minute specimens with miniscule leaves. The "tall" one looked definitely a keeper. After a conference, it was decided to leave the wee ones for another year to see what would happen to them.

Now we are pondering why all these dwarfs should appear in an area no larger than a city lot, most of them within a stone's throw of one another. Do alders normally produce dwarfs with such frequency only to be overwhelmed by their more vigorous fellows or is there something unusual about this particular location? No other dwarf trees of any sort have appeared in the area. However, a few years ago, a pond, which lies just to windward, produced albino tadpoles of the Red-legged Frog *(Rana aurora.)* The appearance of one albino creature is rather unusual; this pond had dozens of them, quite boggling the imagination of the

herpetologist who checked into the matter. Is there any connection between the proliferation of albino tadpoles and of dwarf alders? We have no idea. No more of the tadpoles have been found. Needless to say we are keeping watch for more of the curious little alders.

• • •

In the letter accompanying her article, Mrs. Dusek reports that *Polygala calcarea*, thought by some gardeners to be a difficult, miffy plant, is one of her "favorite good natured plants." In her garden "it makes platter sized mats so smothered in season with its blue flowers that scarcely a leaf is in sight. It self-sows a bit too and all without a lot of fuss and feathers on my part." Mrs. Dusek must have a fairly limy soil. Here, too, in our limestone soil, this lovely little polygala flourishes and self-sows, but will not last a season where the soil is acid.

Note From Alaska

Helen A. White of Anchorage, Alaska sends the following note:

Scientists now believe that there was a bridge of land across the Bering Sea, fluctuating in extent, until the final division between Siberia and Alaska took place about 10,000 years ago. It seems that Alaska is a crossroads for plant species as well as for air traffic. A great deal of plant life found its way across the land bridge as did people and animals. Many plants are the same on both sides of the Bering Sea and others are closely related to those across the straits.

St. Lawrence Island is a remnant of the old land bridge and, as might be expected, is rich in Asiatic species. Alaska is sparsely populated and has had comparatively little serious botanizing. It is entirely possible that species hitherto unknown to this continent may yet be discovered here. It is also likely that further botanizing of the state will result in the extension of the range of many plants, particularly from Siberia. Several plants that are now known to range west in Canada almost to our border may also be found here in the future.

An example of the kind of thing to look for near the American side of the old land bridge is *Salix nummularia*. This willow species has been noted as advancing across northern Siberia to the Bering Straits across from Wales, Alaska, on the Seward Peninsula. Why couldn't it be found near Wales too?

Carbon-14 dating has shown that Alaska's flora is much the same today as it was 20,000 years ago before it migrated to these shores. One might come across some really "old" plants here.

To protect and harden-off young shrubs and evergreens, a snow fence—or equivalent—laid on rails to rest above the plants is a wondrous help. It saves losses among rhododendrons in particular.
D. DeV., Monroe, Conn.

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