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AMERICAN ROCK GARDEN SOCIETY BULLETIN

Albert M. Sutton, Editor

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PLANT HUNTING AT 13,000 TO 15,000 FEET (4000 m to 5000 m) THE ATACAMA DESERT IN CHILE

OTTO ZÖLLNER, Univ. Catol de Valparaiso, *Quilpue, Chile*

As a group of Chilean mountain climbers and scientists we were interested in exploring certain regions of the Atacama Desert, climbing the highest mountain of Chile, the Ojos del Salado (6950 m), studying animal and plant life in the heights between 4000 m and 5000 m, and observing climatic conditions and other ecological problems.

So in the last days of January, 1973 we started from Valparaiso to go to Copiapó, the capital of Atacama Province. Here we got voluntary help from two sources—a rich proprietor of a copper mine, Don Tiburcio, and the Captain of the 1st Chilean Ingeneery Regiment who offered vehicles to transport our provisions. But we had an involuntary halt in Copiapó, so I had sufficient time for plants in this zone. It was not the best season to look for plants, it was summertime in a desertic region, but I found some interesting species: *Solidago microglossa* and *Hedrocotyle volckmanni* growing on the banks of a small river. On drier places I saw *Errazurizia multifoliata,* a small creeping shrub from the Leguminosae. *Solanum elaeagnifolium* is a very abundant shrub with white leaves and blue flowers, its stems are covered with *stings.* On very dry places I could collect Heliotropium with dwarfish white flowers. But the scarcest plant which I could collect was *Malesherbia obtusa* with great blue flowers.

We left Copiapó and followed the international route to Argentine. The *way-mark* indicates: Copiapó (Chile)—Tinogasta (Argentine) 525 km and between these two towns there are no settlements, no water, no gasoline. At first the route follows a large valley, the bottom of it is covered with dried shrubs, the slopes of the mountains are bare, off and on there are some ruins of abandoned huts from old mines. After two hours in our motor truck we arrived at San Andrés, a little oasis between the mountain ridges. The oasis is inhabited by an old goat shepherd. A small brook runs down between *Tessaria absinthioides,* a bush which covered all the bottom of the valley. The graminea *Cortaderia atacamensis* with its white panicles was growing beside the little running water. I took advantage of a halt in this oasis and climbed a slope and discovered some little plants: *Mathewsia nivea* covered

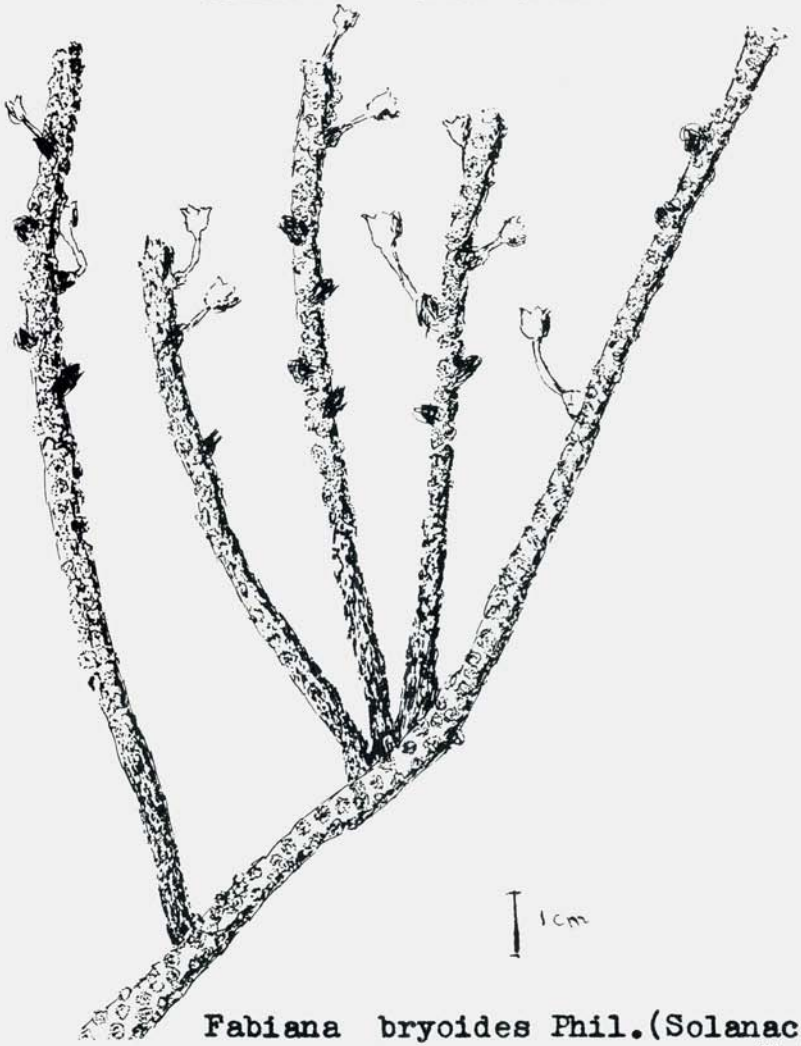
with hairs in such a way that all the plant looked white; then *Adesmia atacamensis* and *Polyschyrus latifolius*. Beside the water grew *Apium chilense*. The taste of the water was slightly salty and the shepherd assured us that this water produces disease.

Then we continued our trip. Slowly but constantly the route climbed and after two hours more we were on the Codocedo Pass 4000 m (13,000 feet). The sun shown but it was not warm, and a cold wind blew. Another halt allowed us to look for plants, but movement in these heights is fatiguing, hearts beat rapidly and after some quick steps the lungs receive little oxygen and one must stop. On the pass I collected *Senecio rahmeri, Adesmia frigida, Chenopodium frigidum,* a Chorizanthe specimen; *Calceolaria pinifolia* with needle-like leaves and small yellow flowers. How can these plants grow in a region where it does not rain? In wintertime these heights are covered with snow, the sun melts it and the earth absorbs the moisture and this little water suffices the plants.

From the pass the route went slowly down in an easterly direction following a dry valley. After a while it opened and before us we saw the enormously wide surface of the salty Lake Maricunga. Its borders were white from pure salt and we supplied our provision of salt by gathering salt plates. In the open salty water we could observe some pink flamingos which flew away when we approached. The route follows the northern border and the easterly border of the lake, passing through absolutely barren land. Then the route begins to ascend to the Colorado Pass which reaches a height of 4800 m (15,500 feet). The first part of the Pass is the most interesting one. The way follows a small channel of water and we found a few plants of Altiplano. *Atriplex chenopodioides,* a little whitish shrub, was very common. Also very abundant was *Cristaria andicola* with big blue flowers. It is a pity that this plant has not conquered rock gardens. Also we collected *Gilia crassifolia,* a plant somewhat scarce. The cauliflower of the High Cordillera, *Nastanthus caespitosus* also grows in the moist soil of the bottom of the valley. Its head is pressed to the soil with hundreds of little white flowers surrounded by dentate leaves. Because of its similarity with the vegetable it is named cauliflower, but really it has nothing to do with it, because it belongs to the Calycera family.

On the slopes of the valley stood a yellow flowering shrub, with great heads, *Senecio eriophyton,* its leaves and stems were covered with white hairs. It is a very aromatic bush and the local inhabitants assure that a tea prepared with leaves from *Senecio eriophyton* helps against height sickness, the feared puna or soroche. The first day all members of our expedition suffered from height sickness, but we drank the tea of these leaves soaked in boiling water and we were well after two days. Who would say now that our recovery was due to our native tea or to our good health condition because we had adapted after a few days? *Fabiana bryoides,* a shrub, was covered with white tubulous flowers, but there were no leaves, only green stems. A careful examination proved that the stems were covered by minute leaves, only 1 mm long, which surrounded the stem. Here we could study how plants protect themselves against irradiation, aridity, frost and wind. Plants reduce their leaves to a minimum or cover themselves with hairs, so that leaves have a white aspect.

We continued our trip, always moving at 4500 m on a wide plain. At a



Fabiana bryoides Phil.(Solanac.)
The Author

distance we saw several mountains which had white caps of snow and the map indicated heights of between 6000 m and 7000 m, and all had the typical form of volcanos. All mountains seemed to be so near to us, but the rare and clear air deceives for we were at quite a distance.

In the afternoon, after ten hours on the truck, we arrived at Laguna Verde (Green Lake), a beautiful clear lake, but too salty for human consumption. Here we put up our tents, here we stayed for three weeks to study biological life, flora and fauna, geographical and geological problems, and some of us climbed some of those icy mountain tops. We had chosen this place for erecting our tents because there is a thermal spring with the water at 40° C. (104° F.). So in the cold mornings when we crept out of our sleeping bags and out of our tents, or in the afternoons, when we were frozen by the icy winds, we jumped in the hot water. The borders of this lake were absolutely

Perezia purpurata Wedd. (Composit.)

The Author

bare of vegetation, they were white from the dried salt; also the surroundings of the lake were rather bare, especially the plains which were exposed to the icy winds which turned to a really stormy wind in the afternoon. Slopes somewhat protected by ridges were covered by *Stipa frigida.* It looked pale yellow, but it had ripe cariopses. We found tufts of *Senecio rosmarinus* which is rather scarce, with great yellow flowers, each plant with 20 to 50 heads. Beside stones a pygmy plant grows; it seems to be a minute, woolly, white ball of one or two inches in diameter. It is *Chaetanthera sphaeroidalis,* a little annual plant. *Nototriche clandestina* is a perennial plant with deep roots and grows close to the ground and has bluish flowers.

A brook fed water to the lake, entering on the western side between high barren cliffs. The cliffs were generally inaccessible. But on the bottom of the valley were some scattered green spots with vegetation. In the water there were little elevations formed by a dense mass of *Patosia clandestina* which grew so thickly that we could step on them and they helped us to cross the water without getting wet. Moss grew on the banks, but it was not fertile. On the sides of the river bed there were three creeping plants which formed cushions;

they did not elevate above the level of the soil. *Ranunculus cymbalaria* formed a dense mass of green leaves and yellow flowers; *Arenaria rivularis* grew close to them with small white flowers. But the most beautiful of them was *Calandrinia oculta* with great bluish flowers. These three representatives of the Andean flora formed a dense carpet beside the river, where the soil was somewhat moist, but beyond the moisture front there was nothing but sand and stones. The most interesting and beautiful of all plants found on this trip was *Perezia purpurata,* very scarce, growing behind the protection of big stones. Perezia belongs to the family Compositae and has a great head with white to pink flowers.

All the plants enumerated here live between 4000 m and 4800 m in a region with extreme climatic conditions. It does not rain in this zone; in winter all is covered with snow and in February, when we stayed there for several weeks, the thermometer indicated 8 to 9° C. below (15 to 20° F.) each night, and February is summertime in Chile. All these representatives of Andine flora are very resistant to frost, to dryness. But until now, they have not conquered rock gardens. There are many beautiful flowers in the High Chilean Cordillera.

RESPONSIBLE ROCK GARDENING

RONALD BOWEN, *Wayzata, Minnesota*

Each year during the winter and early spring months gardeners around the world page through seed and plant lists in anticipation of the coming season. New and old plants are studied, decisions are listed, and acquisitions are made. Hopes grow strong as the sun warms and the mail yields the chosen treasures. Unfortunately, these decisions are made only on the basis of individual garden suitability despite the presence of other important factors. These other considerations deserve to be mentioned and we should all be encouraged to adhere to them. Following, then, are some thoughts on our responsibilities as gardeners.

First, we should be responsible to ourselves and our fellow enthusiasts in creating worthy gardens. The basic concept of gardening benefits most when the quality of each garden is improved and maintained. As a part of this, considerations must be given to the technical concepts of gardening. Appropriate plant relationships must be utilized and united with the media of soil, water, rock, and light. The resulting creation should be attractive and fitting to the landscape. Beauty, of course, is an individual value and is relative to many factors. It seems that most gardeners strive to meet this first basic responsibility above all else. That is, they want appropriate, well-maintained, beautiful gardens and work toward that goal. Perhaps this is appropriate and deserves to be the primary responsibility.

There is, however, one other basic responsibility that needs serious consideration. Each time that seeds or plants are shipped out of their natural growing range the potential for permanently altering that plant's natural distribution exists. If the plant escapes from its new home and becomes established in the surrounding countryside, it can often become a genuine pest. Native vegetation can be edged out by these introduced species resulting in an

upheaval of nature's balance. The greatest danger, of course, is when materials are exchanged between major land masses, but even small re-locations can be significant. Examples are numerous and should be obvious to all. This year the ARGS Seed List alone contains many foreign and invasive plant species that should not be spread across North America. *Ranunculus acris, Dianthus deltoides, Silene armeria, Lychnis chalcedonica, Hypericum perforatum, Potentilla recta,* and several species of *Hieracium* are but a few of those in that category. Likewise, there are seeds on the list native to America that should not be introduced to other parts of the world.

This situation calls for serious thought and action from everyone involved with gardening. All ARGS members should be helpful by doing several things. First, we should make great efforts at confining all garden species from foreign countries or habitats only to gardens. Plants not native to a particular location must be carefully chosen and if they tend to become weedy they should be avoided. Arboretums, universities, and others can be helpful in deciding the potential harm that a plant might do. Second, more consideration should be given to native plant species. There are many beautiful and challenging native plants that have not received the credit they deserve. We could all work harder on these and less on potentially invasive foreigners. A third helpful practice would be to use extra care in shipping seeds and plants to other locations. This might help keep some of our American plants from becoming pests elsewhere. It would also keep our native treasures at home in their native habitats. Finally, we should make every effort to obtain plants and seeds from reasonably local sources. This prevents extensive mixing of species genotypes and assures better locally adapted plants. Luckily the percentage of garden plants that become weedy pests is small as most of the true alpines and wildflowers are difficult to grow away from their native haunts. However, as responsible gardeners we should always consider the potential of each plant and act accordingly.

My intention here has not been one of discouraging gardening but, instead it has been that of encouraging careful gardening. Certainly there are personal joys from the hundreds of beautiful exotic rock plants that have immeasurable merit and in most cases these plants have done no harm. It is the exception that we must watch for and avoid. If we can do this the two basic responsibilities discussed here will be better fulfilled. The results should be neater, more natural gardens surrounded by countrysides that have an appropriate floral balance.

* * * * *

ANOTHER HONOR FOR DOROTHY EBEL HANSELL—"The former editor of the *Garden Journal,* Dorothy Ebel Hansell, was awarded the Honorary Membership Plaque by the American Association of Botanical Gardens and Arboreta at its annual meeting in Arcadia, California. The plaque read in part: 'Dorothy Hansell became a contributing editor in 1955 and editor-in-chief of our quarterly *Bulletin* in 1965, laboring for a total of 17 years to make the AABGA publication a truly fine one . . . From the picture on the cover to the zipcode on the envelope, Dorothy has contributed an unmeasurable thoroughness and devotion.' This is also true of her editorship of *Garden Journal* for many years." Dorothy was also an early editor of the ARGS *Bulletin* and received the ARGS Award of Merit in 1968.

ALASKA'S PINK POPPY

HELEN A. WHITE, *Anchorage, Alaska*

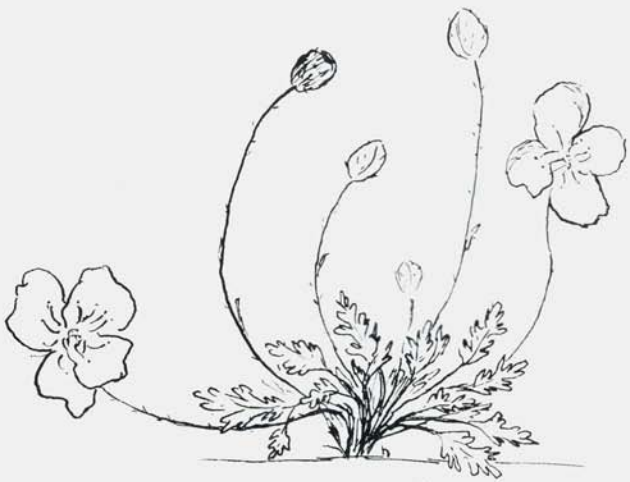
Papaver alboroseum, affectionately known locally as the Little Pink Poppy, is one of Alaska's loveliest flowers. The delicate apricot pink petals with greenish white bases are entirely different in hue from any other blossoms in our great northland.

The tiny charmer may be seen by the thousands along the gravel road shoulders near Portage Glacier southwest of Anchorage and a few miles off the main highway from Anchorage to Seward. It takes a sharp eye to spot them when driving past at the speed most motorists enjoy. They seem to blend in perfectly with their surroundings.

In the wild they grow only to about four inches, springing from neat mounds of fuzzy gray-green leaves. In my rock garden, where they have adapted themselves happily, they attain twice that size. All other poppies I have seen growing in Alaska, and there are several, shoot straight up from the foliage and are taller; but this one first curves outward and then turns up and gives them a unique appearance.

Little Pink Poppies grow well from seed if strictly fresh seed is used and I have transplanted them readily, too. They apparently will not tolerate a situation where they must compete for the sun with other plants. One plant that is even smaller in stature and that they will fraternize well with is that delightful lavender-blue blossom known as the Alpine Harebell or Bluebell, *Campanula lasiocarpa.* Together they thrive and make a beautiful picture. They both like sandy, gravelly soil with plenty of water, although they must have good drainage. And they bloom at the same time, too, for part of the season.

The poppy begins its blooming stage early but if the fruit is kept picked



Papaver alboroseum

The Author

Campanula lasiocarpa

The Author

off they will continue blooming until frost—about a four-month period here in this area. Of course, the campanula is a late "comer."

There is one plant of *Papaver alboroseum* now in my garden (early September) that has more than fifty buds, flowers and seed vessels on it and it spreads out to more than a foot in diameter. It is planted on a sloping part of the rock garden and seems perfectly happy there. It has been growing there for four years or more. They are never this large in the wild.

One year I had so many of these poppies as volunteer seedlings in my garden that I transplanted about 200 into several sizes of peat pots. I kept them until I was sure they were over any transplanting shock. They were then taken to a garden center, 50 at a time. There they sold like the proverbial hotcakes.

According to Hulten, they are found in this one area only in Alaska and also in one limited range in eastern Siberia. J. P. Anderson lists them as collected near Seward and they have been reportedly found near Moose Pass near the Anchorage-Seward Highway. Polunin indicates that they have been collected in Arctic Alaska and Yukon Territory in Canada. Wiggins and Thomas list it as being an Arctic species. Some authors believe it is perhaps *Papaver pygmaeum* of the more southerly Canadian Rockies and Montana. *P. alboroseum* is an Asiatic plant.

Only this July two botanizers, Aline Strutz and Maxcine Williams were fortunate enough to find a white poppy on the westernmost islands of the Aleutian chain. It has been tentatively identified as a white form of *P. alboroseum*. If this is true, one more link has been provided in its range. Whatever the family tree of this appealing little gem, it is certainly one of my favorites in all Alaska.

AN ABBREVIATED PHYTOGEOGRAPHIC REVIEW OF THE SIMILARITIES BETWEEN THE FLORA OF EASTERN ASIA, JAPAN, AND EASTERN NORTH AMERICA

DR. NICHOLAS NICKOU, *Branford, Conn.*

Many plants which originate in eastern North America—some of which are grown as ornamentals—are related to similar or identical species originating in eastern Asia and Japan. This unique relationship has been recognized for many years and is still the subject of considerable study.

The first published reference to this similarity was by Linnaeus in 1750. He noted that plants collected by Clayton in Virginia and by Gaultier in eastern Canada bore a striking resemblance to some he received from eastern Siberia.

Castiglione in 1790 and Pursh in 1814 also referred to these similarities but it was Asa Gray's studies which made the biggest impact and which were the start of what is now known as Plant Geography, or Phytogeography.

Plant Geography involves the study of the distribution of plants over the surface of the earth—a simple enough precept with two major facets; the descriptive and the interpretive.

The descriptive aspect is easily understood and involves identification and location of the plants under study. The interpretive aspect is considerably more complex and involves the questions, "Why is a plant where it is and how did it get there?" This brings into play such sciences as Physiology, Genetics, Taxonomy, Geography, Geology, Meteorology and many others.

Some plant families have very wide distribution. The palms for example are found throughout the tropical world and in large parts of the subtropics. Others with extensive cosmopolitan ranges are the following genera: Drosera (sundews), Utricularia (bladderworts), Ribes (currants and gooseberries), and Vaccinium (blueberries and cranberries, etc.).

Some species have very restricted ranges. *Franklinia alatamaha* was found in a small area of southeast Georgia and is probably now extinct in the wild. *Neviusia alabamensis* was known from a tiny part of Alabama originally but has recently also been found in Arkansas.

The genus *Eucalyptus* is confined to one region — Australasia. The Tropaeolaceae (Nasturtiums) are found only from Mexico to Chile. The Proteaceae are concentrated in Australia and South America and are chiefly of the Southern Hemisphere but some scattered genera are found as far north as the Tropic of Cancer.

Some genera are highly endemic—found only in one area. For example, the following genera are found only in eastern North America; *Dirca* (leatherwood), *Hudsonia* (beach heather or false heather), and *Sanguinaria* (bloodroot).

The subject of this article is an example of a discontinuous distribution of which there are many examples. Discontinuity is significant if a plant group is found distributed over two or more widely separated regions. Also, it must be assumed that the range was formerly continuous and that subsequent dis-

junction resulted from natural causes. The distances between the locations of some disjuncts can be startling.

Empetrum nigrum (crowberry) is circumpolar in the north but is also found in southern South America, on the Falkland Islands and on Tristan Da Cunha in the middle of the South Atlantic.

Liriodendron (tulip tree) is found in Eastern North America as *L. tulipifera* and in central China as *L. chinense*. There are no natural occurring tulip trees found in the multi-thousand-mile hiatus between the two known species but fossils have been found in western North America and in a good part of Europe—chiefly in southern England, south through France and Germany to Italy.

Clethra (sweet pepperbush) has an equally spectacular discontinuous distribution. The genus is found from eastern North America down through Mexico, through the Caribbean Islands to northern South America. It then leaps to east Asia, Japan and Indonesia but difficult to explain is the existence of one species, *C. arborea* in Madeira, a group of islands off the northwest coast of Africa.

Another unique and interesting example of disjunction is the distribution of the three varieties of *Rhododendron ponticum:* var. *baeticum* is found in southern Portugal and Spain; var. *brachycarpum* in the mountains of Lebanon and the var. *ponticum* along the eastern, southern and western edges of the Black Sea with a vertical distribution of from 100 to 2500 meters. Fossil stations are known from the present areas and from five intermediate sites. The species was probably continuously distributed through the mountains of Europe during interglacial times.

One of Gray's first publications on this subject resulted from studying plants collected by Siebold in Japan which were described and illustrated by Zucharini. He noted the similarity of such genera in eastern North America as *Styrax, Aralia, Catalpa,* and *Cornus* with similar species in Japan.

Our *Cornus florida* was compared to *Benthamia japonica* (now *C. kousa* —a superb ornamental). The American *Catalpa* was related to the Japanese *Paulownia* (empress tree). Following the Gray era other species of *Catalpa* were found in central China which further widened the disjunction.

During the ensuing thirty years Gray wrote many more papers on this subject. One in particular was an extensive treatise published in 1859 entitled "Diagnostic Characters of New Species of Phaenogamous Plants, Collected in Japan by Charles Wright, with Observations upon the Relations of the Japanese Flora to that of North America and Other Parts of the Northern Temperate Zone." The expedition was led by Captain John Rodgers after whom the genus *Rodgersia* was named.

There is an extensive text of observations, comparisons, and discussions of taxonomic difficulties. Almost 600 species of Japanese plants are studied and incorporated into comparison charts showing their occurrences not only in Japan but also in the following locations: Central and northern Asia, Europe, western North America and eastern North America.

To cite a few examples: *Coptis trifolia* (gold thread) and *Menyanthes trifoliata* (bog bean) were listed in all five of the areas compared; *Diphylleia cymosa* (umbrella leaf) was found only in the eastern United States and in

Japan. With the passage of time and further exploration *D. sinensis* was found in central China. We at present have sufficient differences between the Japanese and the eastern United States forms to name the latter *D. grayi* and the former to continue as *D. cymosa.*

Streptopus roseus (twisted stalk) is found in Japan, western North America, and eastern North America but not in central or northern Asia nor in Europe. The well-known blue cohosh *(Caulophyllum thalictroides)* was found only in Japan and in the eastern United States but it also fell to the more sophisticated botanists so that the original *C. thalictroides* remains the eastern United States representative while the Japanese form is now *C. robustum.*

Thus, what has happened with time is that the matching up of similar plants occurring in Japan, eastern Asia, and eastern North America is more a generic rather than a specific similarity. Still, some forms occurring in both locations remain so completely alike that they remain a widely disjunct species. Examples of these are *Phryma leptostachya* (lopseed), *Anaphalis margaritacea* (pearly everlasting), and *Symplocarpus foetidus* (skunk cabbage).

I would urge those interested to read this paper as it is both enchanting and impressive in its early sophistication and depth. Another more modern review which is more easily available is "Floristic Relationship between Eastern Asia and Eastern North America" by Hui-Lin Li of the University of Pennsylvania.

Attempts to explain this particular pattern of distribution have implicated land bridges, glaciation, continental drifts, and other factors.

Gray felt that an earlier land bridge at the site of the present Bering Straits was significant.

Hooker was of the opinion that the mountains of western America and the east-west running mountains and bodies of water in Europe and western Asia resulted in the extinction of many forms during the fourth migration south in the Pleistocene or glacial era.

The retreat south in eastern North America and eastern Asia was not hindered by the north-south coastline, and the north-south running mountains —the Appalachians in North America and the mountains of Kamchatka and Japan in eastern Asia.

This theory, therefore, contributes the chief factor involved—glaciation —to naming the distribution pattern involving these areas—namely "The Pleistocene shift or disjunction."

There are still many students of the subject and many more plants which the reader will recognize in this remarkable pattern of plant distribution.

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DR. WORTH'S GARDEN

MARY TIBBETTS FREEMAN, *Ithaca, New York*

Part II: The Rock Garden—Spring

Dr. Worth's rock garden lies just outside the alpine house, to the north and east in a level open space at the edge of the lawn. On the west at the end of the potting shed a large crab apple tree marks the northern corner. Smaller crab trees, a clump of *Daphne mezereum album,* a grouping of tree peonies and, behind the peonies, a copse of hazelnuts border the garden on the north. In front of a low fence, plantings of pulmonaria, primroses, anemones in blue, pink, yellow and white—*A. nemorosa, A. ranunculoides* (both single and double), and *A. blanda* (in all shades)—the striped-leaf Lily-of-the-Valley *(Convallaria majalis variegata)* and other shade lovers under an apple tree to the north and a plum tree and clumps of lilacs to the south mark the extent of the garden to the east. Since the small field beyond the fence in May is golden with daffodils which have become naturalized and throughout the summer is abloom with *Geranium traversii,* veronicas and other escapes, and since also in spring you look across the small field to the brilliance of azaleas, rhododendrons, magnolias, and other flowering shrubs and small trees grouped on the outskirts of the old rock garden, only formally can the garden be said to end with the fence on its eastern edge.

In extent the rock garden is not large, containing probably roughly 2700 square feet. When 22 years ago, in the summer the Korean War broke out, the quick decision to move the rock garden was forced upon Dr. Worth and the garden was built and plants were moved, as he has said "practically on one Sunday," the small size and convenience of the area were important considerations in the choice of the present location. Yet, although the garden's actual size is small, since all structural elements employed in it—mounds, curves, varying heights, and changing levels—are directed toward the greatest use of space and exposures, much more room is available for planting than might be in another garden, one, say, on a sloping hillside, of comparable extent. A pattern of over-planting also helps greatly to expand the use of all space throughout the season. So as soon as the snow goes off, *Hyacinthus azureus* and chinodoxa make the northwest area in front of the large crab apple tree a sheet of blue. In the same corner a little later comes the double Lily-of-the-Valley in quantity, an uninvited pest, and among the thickly blossoming spikes show the stalks of species peonies, rich red in new spring growth. By June the peonies are in bloom—the shrubby *Paeonia* 'Canary' or 'Arcadia,' *P.* 'Chamaeleon' and *P. woodwardii*—soft yellows, pale pinks, and brilliant red. *Iris forrestii* comes next, and lilies—the martagons in June and later the Henryi hybrids, and others including *L. tsingtauense* whose bloom make bright patches of color among the branches of the crab tree. By August, the seed heads on the peonies are bursting open to show a striking combination of bright blue seeds against the ruby red lining of the pods. And in September the colchicums start a succession of bloom which generally lasts for two months or more, until the snow comes and puts an end to the season.

In shape the garden is roughly square. Two large rounded mounds rise

in the center to the north and south. The south mound is made from soil which was at hand and is slightly larger and rounder. The north mound is somewhat sprawling and sandy, because when the garden was so quickly made, a load of sand and clay for use in soil mixing and potting happened to have been dumped there. A few years ago Dr. Worth extended the side of the north mound northeasterly into a little bed, a sort of little plateau, and by a circle of stones marked it off from the *Primula sieboldii, Tricyrtis hirta alba,* and autumn blooming gentians toward which it reaches out. In this special little area he planted European primroses and here several still grow—some auriculas and *P. marginata*—but other plants have crept in and seem to like it; species narcissus, small choice androsaces, *Aquilegia saximontana;* even *Haberlea ferdinandi-coburgii* finds it congenial, the only place in the garden where it chooses to survive.

To the south a narrow path enters the garden from the lawn, squeezes around a large "dwarf" (15 feet) juniper opposite the entrance to the alpine house, steps down over a flat rock facing the south mound, and divides to lead in either direction, encircling the mound and winding through the garden. As it curves around the south mound, the path is sunken, for the beds which border it on the south or west as well as the mound itself, are higher. After it cuts between the mounds, however, the path climbs slightly as it turns around the north mound, and the plantings beside it on the west and north level off. Just before the turn around the north mound, the path branches directly west along a ledge-like foot-high dry stone wall which runs back toward the potting shed, separating the raised areas from those on the level. Along the foot of the wall in recent years Dr. Worth has been planting small delicate ferns—dainty spleenworts, the sensitive fern, and the lovely Venus Maidenhair *(Adiantum capillus-veneris L.)* which although it should not be hardy here, amazingly, during the last three seasons not only survived but increased.

In the northward-facing front of the wall, with their rosettes of leaves pressing flat against the rocks, grow ramondas of the palest pink; for a while there was even one that was almost white. Along the top of the little wall together with silvery-leaved alyssums and dainty polemoniums, the lovely gray-leaved fragrant *Matthiola scapifera* grew and blossomed happily for several years before taking itself off. Back from the wall top a short way grows the distinctly marked Prophet Flower, *Aipyanthus (Macrotomia) echioides;* and at the front corner of the wall, at the top on the curve where the path branches, grows one of the glories of the garden, the red pulsatillas in six or eight clustered clumps, ranging in color from soft pink through darker shades and brick reds to deep rich velvety crimson. Beautiful in blossom in the spring, they are equally beautiful in late summer when silvery-feathered seed heads shimmer softly above the dark roughly-cut foliage.

A thick mulch of stone gravel covers the surface of the mounds and the curving sides rising above the path on the south and west, but apart from the dry wall and the small stone fence around the plateau-like bed on the side of the north mound, there are few rocks in the garden. Indeed what there are could almost be counted. Some large rocks are built into the bases of the mounds; a few more support the changing levels of the curving sides on the south and west where the path steps down. A lovely stair of short crevices overgrown with saxifrages, *Androsace sempervivoides,* and *Erinus alpinus*

steps up on the north side of the south mound. And just over the crest of the north mound several rocks jut out to make a shallow, crannied ledge where blue-flowered ramondas grow in the crevices. Yet, though few in number, in addition to the interest and effect they provide in concert with the rock plants which grow around and over and among them, throughout the growing season the rocks in Dr. Worth's garden are on their own the source of very real beauty. Over the years they have become encrusted with grayish-green lichens, large lovely spreading rosettes or branching leaf-like forms which complement in texture and color the plants nearby and contribute attractiveness to the garden.

By mid-May Dr. Worth's garden—indeed the whole property—is in full bloom. Marsh marigolds make golden the boggy area where his land begins to the west. Across the road from the house the old orchard and the seedling wild apple trees which are expanding the orchard are at their blooming height. A host of daffodils, many kinds and many colors, fill the roadsides on either side, and the lovely old golden double *Narcissus* 'Van Sion' trails along to the east in an irregular line for one-tenth of a mile where years ago it was scattered when a piece of road machinery scraped the edges of the road too widely. The lilacs which border the lawn on three sides of the house, single and double and in colors ranging from the whitest of white to the darkest of purple, are beautiful and fragrant. In front of the house an ancient much pruned, double-flowering Japanese cherry defies old age and clothes its remaining limbs in glorious pink.

The flowering crab apple trees at the back of the rock garden are in rich lovely blossom, and in the rock garden itself flowers and colors are in abundance. On the sides of the mounds mats of *Douglasia vitaliana* are golden, the bright flowers hugging close to the gray-green foliage. The Juno iris—blue *Iris* 'Warlsind' and *I. willmottiana alba* which have been growing in Dr. Worth's garden for at least twenty years—come and go quickly. White-flowered *Draba dedeana* and the more showy yellow-flowered *D. aizoides*—both true forms—lift largish flowers well above small tightly clustered rosettes. Several globularias show power puff flowers in varying shades of blue, *G. cordifolia,* and *G. bellidifolia, G. incanescens,* and two distinctive species still unnamed, from recent expeditions to Iran and Turkey. And close by on the southwest side of the south mound, several plants of physaria are beginning to lift blossom buds above silvery gray rosettes. The buttercups are well represented: *Ranunculus montanus* all golden, the double *R. speciosus, R. gramineus,* copper-colored *R. ficaria* 'Cupreus,' and a little later *R. amplexicaulis,* white and lovely. *Anemone hortensis* which fifteen years ago Dr. Worth planted as a single small tuber, in 1971 displayed five large blossoms, rose-pink with a bluish center.

In May, however, the glory of the rock garden centers in the eastern section where under the apple and plum trees wildings and other shade lovers grow: The double bloodroot, *Sanguinaria canadensis* 'Flore Pleno,' so white and glowing, *Hepatica media* 'Ballardii' whose large bluish-lavender blossoms seem almost luminescent; *Corydalis cava* of the distinctive reddish-purple or white flowers; *Polygonatum odoratum variegatum; Tiarella cordifolia;* a dwarf, very deep blue form of *Mertensia virginica; Epimedium* 'Rose Queen' and E. 'Snow Queen'; a fully double viola whose white and lavender-pink

blossoms are very fragrant; and several dodecatheons. Growing here in the semi-shade and notable among the dwarf and miniature narcissus blooming here and there in the garden (*Narcissus cyclamineus, N. juncifolius, N.* 'Rosy Trumpet,' *N.* 'April Tears,' and others) is *N.* 'Ruth Ware,' a little all-yellow trumpet hybrid which originated in Dr. Worth's garden and which he has named for a gardening friend of many year's standing. At the time Dr. Worth discovered *N.* 'Ruth Ware' the only other narcissi growing in the rock garden were *N. minimus, N.* 'King Alfred,' the old double yellow *N.* 'Van Sion,' and a double white *N. poeticus.* Of these, only *N.* 'Van Sion' blooms at the same time as does *N. minimus,* and so these two must be the parents. *N.* 'Ruth Ware' is in many ways a somewhat larger *N. minimus.* Its flower stems are about five inches; and of the flower itself, both trumpet and perianth segments are truly dwarf and, like *N. minimus* in good proportion. The trumpet is one-half to three-quarters inch long; the segments about one inch in diameter and open. The mouth of the trumpet is slightly frilled. In color the foliage is somewhat glaucous, and the leaves are about one quarter inch in width. *N.* 'Ruth Ware' is sturdier and stronger than *N. minimus;* both leaves and flower stems grow upright without leaning. Although somewhat uneven in flowering—in some seasons it blooms fairly freely, in others more sparsely—it is nonetheless a distinctive and most attractive little plant.

Outstanding among the wildings in this part of the garden, including *Podophyllum emodi* and the several erythroniums (*E. hendersonii, E. tuolumnense, E. dens-canis, E. mesachoreum,* and *E. albidum* which as a boy Dr. Worth knew growing wild) are the trilliums—eight or nine different varieties in assorted sizes from the tiny *T. nivale* and *T. rivale* to *T. vaseyi,* and colors—pink, red, white, yellow, and green; *T. cernuum, T. erectum, T. stylosum, T. sessile, T. grandiflorum, T. luteum.* The flowers of most are single but *T. grandiflorum* in both white and green is present also in the fully double form—beautiful large flat splendid blooms in which the multiple petals are uniformly and evenly spaced around the center. The blossoms are open and wide, and the rows of petals may clearly be seen. Among the double whites, the color is pure rather than creamy: among the greens, the petals whiten toward the tip so that the effect is almost bicolor. In all the doubles the blossoms are held high, well above the leaves. Planted in drifts, in bloom the trilliums in Dr. Worth's garden comprise a beautiful and memorable sight.

Scattered here and there, sharing the lightly shaded area with the trilliums and other wildings are many primroses, and in mid-May most are in bloom—*P. acaulis* in many shades, *P. polyanthus* (many are gold-laced), yellow cowslips in abundance, *P. juliae* and *P. juliana* in a range of colors, *P. denticulata* in the red and pink as well as the lavender-purple shades, yellow Hose-in-Hose, and a charming orange ruffled Jack-in-the-Green, *P. auricula* (including a double white one!), *P. sieboldii* in colors from white to palest pink to lavender and lavender-blue, including several named forms such as 'Apple Blossom' and 'Dora.' Most of these primroses Dr. Worth has raised from seed, and in the last several years, he has been having fun especially in growing the double primroses from seed. May, 1971, brought success when eight or nine plants raised from Barnhaven seed burst into beautiful bloom. The plants, two years old from seed and planted out in the garden early in the previous summer, are mainly of the acaulis type. All are fine strong plants

with rich dark green foliage, and in the two years have grown to be good-sized clumps. The blossoms were spectacular—abundant, of good form and beautiful pure clear color. In size each blossom was at least an inch in diameter; some were as large as a fifty cent piece. Colors ranged from cream to yellow (to different shades) through golden pink to clear pink to crimson and rosy purple. Only the blue shades were lacking. Several were silver-laced. Each plant bore a profusion of blossoms and buds—and the blooming period extended from about the twelfth of May until about the first of June. The double primroses are beyond question both beautiful and exciting. Small wonder that Dr. Worth is eager to see what 1972 will bring in the way of blossoming to a second—and larger—batch of seedlings, and how yet more seedlings coming on will perform in the future.

Late May is a good time to visit the old rock garden for although it has been abandoned for more than twenty years, it still contains much of interest. The slight path that leads to it through the lilacs at the border of the lawn passes through an area overgrown with *Vinca minor*—the foliage handsome and flourishing and the flowers double red-purple or lavender-blue. *V. m. purpurea plena* and *V. m. caerulea plena* respectively. Beyond, to the right, are drifts of *Anemone blanda,* white, blue and a lovely rose pink. Here and there under native dogwood and old crab apple trees grow polyanthus primroses in all colors—single seedlings and many obviously long-established clumps which Dr. Worth always identifies as 'Miss Jekyll's strain.' To the left, surrounded by azaleas, rhododendrons, and leucothoe is a very large-leaved magnolia which stands about fifteen feet high and which Dr. Worth planted many years ago as *M. macrophylla* but which proved to be *M. tripetala.* Generally described as "hardy for Pennsylvania southward," since before World War II *M. tripetala* has grown and blossomed each year in Dr. Worth's cold garden. Such unexpected hardiness characterizes several of the plants which continue to grow and blossom yearly in the old rock garden.

A little to the south of the magnolia grows an English filbert, a tall handsome tree which years ago the Arnold Arboretum sent to Dr. Worth to try for hardiness. Each fall it bears a bumper crop of nuts. At the same time and with the filbert came a specimen of *Fothergilla major.* Fothergilla is generally considered as hardy to Zone 5; year after year in Dr. Worth's old rock garden the now 5-foot bush covers itself in the spring with curious white thimble-like blossoms, and in the fall becomes equally striking and beautiful through the brilliance of the red, orange and yellow coloring. Beyond the filbert to the south for many years a large patch of *Alstromeria aurantiaca,* The Lily of Peru, has made a splendid show in midsummer with many bronzy gold-flecked blossoms, even though *Park's Flower Book* says of it: "Hardy to Philadelphia with mulch. Farther north dig and store the roots." And in the old garden proper each June when it blossoms *Lithospermum purpuro-caeruleum* makes a low bank along in front of a plantation of hazelnut trees, blue with a myriad of beautiful azure drooping bells.

With other plants in the old garden hardiness is not a question. Seedlings of *Paeonia officinalis lobata* grow casually here and there and blossom freely. Heathers and heaths and woody potentillas thrive; and a lovely white-blossomed form of *Rosa spinosissima (R. s. altaica)* spreads itself about happily. For many years *Clematis alpina* climbing from roots now hidden far back

under a twenty-foot high dwarf spruce (diameter six feet) has borne its beautiful blue and lavender blossoms out of reach among the branches at the top. Each year also blue blossoms generously adorn a large bed of *Iris ruthenica* so-called, but beyond being blue and dwarf, bearing, Dr. Worth says, no resemblance to the picture of *Iris ruthenica* in Dykes's *The Genus Iris,* although it is thought it was generally being circulated as *I. ruthenica* in the late 30's. At one time Dr. Worth had a plant of the Japanese *I. ruthenica nana,* a lovely thing, but it stayed with him but briefly. And each May in the old garden close by the entrance to a woodchuck's hole, blossomed *Daphne cashmiriana.* This daphne which came to Dr. Worth before the Second World War from Lt. Col. C. H. Grey, resembles *D. cneorum* both in flower and growth pattern. The blossoms are a deep clear pink (not rose pink) and are very fragrant; the narrow oblong leaves are a good darkish green and very slightly glaucous; and in blossom time when the dense terminal clusters of bloom spread out and down over a rock toward the north and slightly eastward, *D. cashmiriana* is a thing of great beauty. Here in a small knoll in the old garden, with its roots probably down between good-sized rocks, is the only place Dr. Worth has been able to persuade it to grow; of late years he has not been able to get cuttings from it even to strike.

By June in the rock garden the chief area of bloom has shifted from the shady eastern section to the mounds in the center. To be sure beyond the apple tree the tree peonies blossom in reds and crimson, rose and pink and make a brilliant show; and under the trees spots of color are provided by dodecatheons in colors from the darkest pink to white, by *Cortusa matthioli* lifting tiny dark red pendant bells above soft crinkled leaves, and by *Lilium duchartrei, Farrer's* "Marbled Martagon," a lovely little white lily speckled with dark purple or chocolate. *L. duchartrei* moves about so unpredictably and widely underground that one can never be sure just where it is going to come up, so each spring Dr. Worth refrains from digging where it should be growing until after it has appeared. Dr. Worth's lily is probably from Farrer's collected stock, for it came to him years ago from the famous Renton garden in Scotland as *L. farreri.* But colorful as these may be, they are nonetheless stragglers among the wildings, most of which are early bloomers.

In general for the rest of the gardening season, the main show is to be found in the sunny open sections. Aubrietas in many shades and for the most part in double forms make splashes of rich color among the rocks by the steps. On both mounds *Aethionema pulchellum* blooms in a charming abundance of pink flowers while on the south side of the south mound. *A. cordatum* blooms in yellow. Nearby the physarias lift bright yellow blossoms on arching stems above silvery-gray leaves. Years ago Dr. Worth collected this physaria in Crazy Women Canyon in the Big Horn Mountains in Wyoming. He has never been able positively to identify it. Although it closely resembles *P. didymocarpa,* it is much more perennial and self-sows readily. *Genista sagittalis* and the smaller neater *G. delphinensis, G. dalmatica,* and the almost flat *G. procumbens* make a bright show of golden pea-like blossoms. *Alyssum argenteum* by the entrance, *Potentilla verna nana, P. tormentilla-formosa (P. tonguei),* and the yellow-eyed grass *Hypoxis hirsuta* are also among the June blossomers. On the south side of the north mound *Erodium chrysanthum* holds scattered sprays of soft yellow flowers above lovely feathered silvery foliage. Alpine

poppies blossom here and there in yellow or white but are reluctant to self-sow in Dr. Worth's garden. *Iberis* 'Little Gem' and arabis in both the single and double all make glowing patches of white. The white blossoms of *Dryas octopetala* are more creamy in tone and are beautiful above low-lying dark green leaves. *Potentilla alba* and *Bellium minutum,* if less showy, are nonetheless delightful.

The pink blossoming plants are quieter and softer. An interesting very dwarf *Geranium sanguineum* produces rose-pink flowers starting in June and continuing off and on throughout the season; *G. dalmaticum* is also present, both in the usual good clear pink and also in a less common—and not as pretty—very-pale-pink-almost-white form. Several helianthemums show shades varying from pale pink to good dark rose. An erodium hybrid which appeared in Dr. Worth's garden years ago holds pretty medium-sized heads of soft rose above bright green coarsely cut foliage. For the past several seasons a small clump of calochortus has blossomed in pink (and white and yellow) on the west side of the north mound, by the turn of the path. In several places *Alyssum (Ptilotrichum) spinosum* covers its spiny silvery foliage with clusters of small flowers, some are rather dirty pale pink but others, of the better forms, have clear warm rose. A patch of *Valeriana supina* bears many short-stemmed pinkish flowers; a selected arabis blossoms truly pink; the large flowers of *Silene wherryi* are of a particularly good color; and the heads of flat blossoms of *S. virginica* are held high on thin narrow-leaved stems, not pink at all but a brilliant flaming startling red. The soft rose blossoms of *Daphne arbuscula* cluster close among the dark green shiny foliage and perfume the whole neighborhood around where it lives on the south mound. The flowers of *Androsace primuloides* are a deeper pink than those of *A. sarmentosa;* both blossom freely, holding their flower heads on four-inch stems above spreading mats of close rosettes. In little scattered clumps *Dianthus alpinus* covers itself with large showy pink blossoms; here and there a plant of very dwarf nature holds its flowers on one and one-half-inch stems so tight and close that they almost cover the deep green mat of leaves. As a rule *D. alpinus* tends to be a short-lived plant, but Dr. Worth has had one plant of the extra dwarf form growing between rocks on the northeast side of the north mound for at least fifteen years.

So many alpines, in gardens at least, are short-lived, and in several species individual plants often seldom last more than a few years. So, like most rock gardens, Dr. Worth's garden changes in appearance from year to year, as familiar plants disappear or as young transplants come on and blossom in a different location. For several years in June a group of *Aquilegia scopulorum* (collected plants) adorned the north slope of the north mound with graceful long-spurred blue or pink creamy blossoms above the glaucous deep-cut curly foliage. Now all are gone, and although there are several plants in the alpine house, for the past two years they have not bloomed. So, too, for years in early midsummer martagon lilies lifted great stalks of white or burgundy or dusky rose flowers along the northern border of the garden—waist high and breathtakingly beautiful. And then one year except for a few scattered small plants, suddenly they were gone. And so, too, for several years a plant of *Clematis alpina* trailed in a most charming fashion over a rock on the south side of the south mound, facing the path as it steps down. Through-

out the summer its good green lacy foliage was decorative among the rocks and during June and July one or two and sometimes three beautiful large solitary blue and lavender blooms nodded over the rock at a convenient height for close-up admiring. But although long-lived in the old garden, in the present rock garden *Clematis alpina* disappeared after a few years. Dr. Worth is always propagating and replanting and, as already noted, one of the main functions of the alpine house is to act as insurance against total loss. Yet, sometimes, as in the case of *C. alpina,* seedling stock is not yet ready to go out-of-doors, or, as usually happens, the replacement is planted in a different location; so a happy effect is lost and the garden changes.

Clematis alpina no longer blooms in the rock garden, other clematis species and hybrids climb over and among the shrubs or dwarf conifers and blossom throughout the season. *Clematis crispa* twines around in the fifteen-foot dwarf evergreen which halfway blocks the entrance path, opening the first of its beautiful pendant bell-shaped light blue fragrant flowers in June. In September, 1971 it was still blossoming. And there are other blue flowers although blue is not the predominate color of the June garden—ramondas in light blue, dark blue or purplish; *Phyteuma scheuchzeri* casually seeding itself around; *Edraianthus pumilio* on the bank beside the alpine house door, a good form with blue-lavender bells; *Iris gracilipes,* the double form bearing lovely fleeting multipetaled lavender-blue blooms; *Campanula bellidifolia* and *C. tridentata* opening the bellflower season; a dwarf delphinium from America's mid-west flaunting a spike of rather large dark purplish-blue blossoms; *Lithospermum intermedium* in a loose clump but vivid and exciting through the color of its clear blue flowers; and just east of the north mound. *L. doer-fleri* holds its narrow dangling bells of deep purple a foot or more high. (Part III will follow later).

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SAN FRANCISCO—APRIL 19-20-21—To attend the 1974 Annual Meeting in San Francisco on those dates is a MUST for many ARGS members. By the time you read this, prior to April 15 (it is hoped) and you decide that you must attend the meeting and need more information, call 415-388-4766. It is hoped we will see you at the Westbury Hotel Friday afternoon.

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RHODODENDRON CANADENSE—In the current ARGS Seed List on the inside front cover is a two-line quotation from a poem by Ralph Waldo Emerson. Gus Arneson, a Seattle member, suggests that this quotation from "The Rhodora" be amplified a bit. It ends as follows.

> "Rhodora! If the sages ask thee why
> This charm is wasted on the earth and sky.
> Tell them, dear, that if eyes were made for seeing,
> Then Beauty is its own excuse for being:
> Why thou wert there, O rival of the rose!
> I never thought to ask, I never knew:
> But, in my simple ignorance, suppose
> The self-same Power that brought me there brought you."

THE FIRST WEST STUDY WEEKEND

PAUL A. PALOMINO, *Seaford, N. Y.*

(Editor's Note—It had been the Editor's intention to include reports of both the East and the West Study Weekends in this issue. Paul Palomino, the only ARGS member to attend both affairs, has written the following account of the West SWE but no account of the East SWE has been received in time for the April issue. Should such an account be received later it will appear in the July issue.)

Having many friends in the West, I thought it only fitting to attend their first Study Weekend. With much pride I attended the christening and lo and behold the infant of Roy Davidson, chairman, and his committee, walked! Never did it falter. A more polished and well-arranged program could not have been desired. One would have thought they had been arranging study weekends for years. Felicitations to Roy and his committee for a wonderful job.

The program got underway Friday night, Feb. 1 with Dr. Arthur R. Kruckeberg on Plant Distribution in the Cascades and his straight man, Dr. Julian D. Barksdale on Geology. This combination, the first for a study week end, made a very educational and interesting program which should be done more often.

The Saturday morning programs started with Dwarf Conifers and Shrubs of American Origin with Roy Davidson as moderator. Panelists: J. F. Caperci, H. H. Dickson, B. O. Mulligan and guest panelist, P. A. Palomino. The panel and audience were in complete harmony, so much so that the questions from the audience had to be stopped or else the program would have run overtime. I was honored to be a guest panelist on such an informative panel.

Next was a coffee break and a mad rush to purchase some of the hundreds of books at the book sale.

After the audience had been seated at gun point, Bob Woodward, of Vancouver, B. C. presented his superb and very informative program, Special Plants for Special Places.

Following luncheon there was a small stampede for the book sale. After the riot squad did its job the program proceeded with a panel on Raising Plants from Seed which was moderated by B. O. Mulligan with panelists A. J. McPhail, Laura Jezik, Mareen Kruckeberg and M. Black. Audience participation was lively and continuous and one may always learn something of value. More coffee and book sales, followed by a program on Trough Plants by Robert Putnam, a skilled nurseryman and plantsman who surely must have the secret of growing tricky alpines in his handsome, homemade, landscaped troughs. The audience was captivated by his lecture and display of troughs with flowering plants.

Next program—Andean Alpines from H. F. Comber's historic slides of 1924 which many of us have seen pictured in S. Clay's *Present Day Rock Gardening*. Mentioned must be the antique projector which was used to show these beautiful black and white slides. This antiquarian delight was presented

by the team of McPhail and Woodward and it set the stage for our modern day Andean explorer, John Watson from England, whose program followed the cocktail hour and dinner.

John Watson's program was Flowers of the Andes—Plant Exploration in the Southern Andes. John, warmed up from his presentation a week before in the east, hypnotized the western audience with exceptional slides of extraordinary rare and beautiful plants. The wit with which he described some of his Andean experiences had the audience in tears with laughter. The plants seen on his slides were so spectacular that everyone attending would have followed him on another expedition, if a plane had been waiting. Truly, his program was the highlight of the weekend, so much so, that the members wandered the halls unable to sleep until the excitement of the program ebbed.

Sunday morning, Jim McPhail, our western North American counterpart of John Watson, took us on a plant exploring trip covering many western states, their mountains and the plants growing in them. His subject was Western American Alpines. As usual, Jim was spellbinding.

Plant sale—hundreds of rare and hard to find alpines, conifers and woodland plants were carried off by the boxful as the week closed; a resounding success.

I wish to thank Roy Davidson and his committee for their effort and hard work which made the first Western Study Weekend a spectacular and successful one. I hope next year the word "annual" will replace the word "first" in the title.

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AN IDEA FOR A GOOD PLANT LABEL—Mr. Henry Hyderhoff, "Laurel Ridge" 348 Glenwild Ave., Bloomingdale, N. J. 07403 writes: "I would like to submit an idea I have been using about plant labels. After we have graduated from raising petunias and have established our rock garden with many plants the overall effect is quite likely to resemble a graveyard with all the white labels in row upon row."

He wrote that there is a very good label on the market that has all the prerequisites of a good label except that it is white. He added that by lining them up on the edge of a piece of corrugated cardboard with the stems in the holes they can be sprayed with a pale green paint (readily available at any hardware store). Plant names can be made with a plastic tape label machine and attached. By using a long piece of cardboard a dozen or more can be sprayed at a time. He wrote, "I have been using these labels for over three years and they are still like new."

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THE 1976 CONFERENCE—Since the theme of the conference is The Alpines of the Americas, the more time that those attending can spend in subalpine and alpine regions the better. Possibilities are being explored that the Seattle part of the conference may be held in a mountainous area east of Seattle at an approximate elevation of 4200 feet, where the accommodations will be adequate and access to the true alpine areas relatively simple. Further details as to locations, programming, etc., both in Seattle and British Columbia, will appear in subsequent Bulletins.

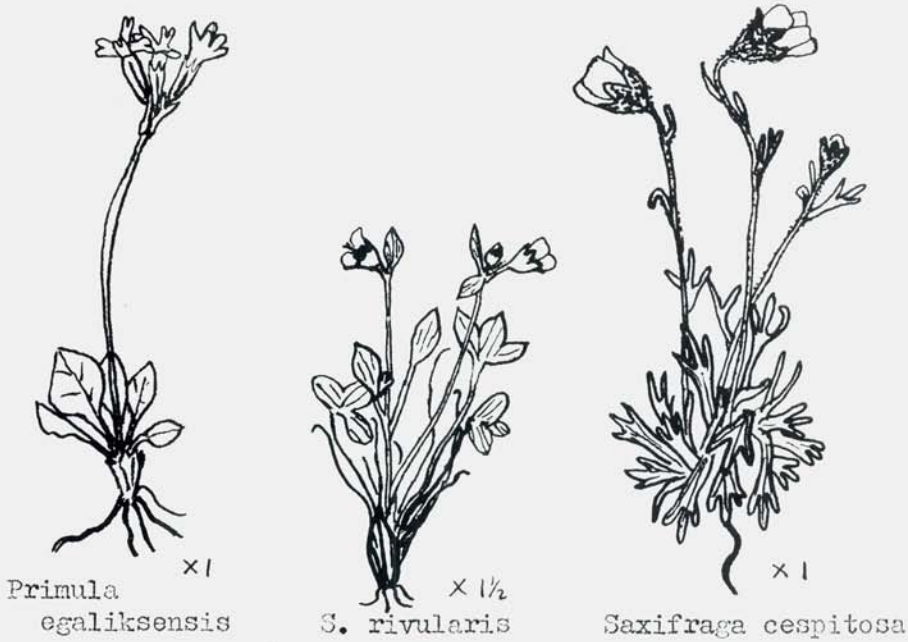
PLANT COLLECTING AT CHURCHILL, MANITOBA

P. J. COTTERILL, *Lynn Lake, Manitoba*

At Churchill, in northern Manitoba, an outcropping of Canadian Shield granitic bedrock along the coast of Hudson Bay has created mile after mile of superb natural rock garden. The crevices and ledges of the rocks and the sandy or soil-filled hollows between them provide happy hunting grounds for the rock garden enthusiast. Yet the rocky shore is only one of a number of different habitats that occur in close proximity in the Churchill area and make it so interesting botanically. The dry summits of the rocky outcrop ridge are occupied by tundra, with a flora characteristic of the Barren Grounds to the northwest, and elsewhere along the coast are flattish expanses of sand dunes covered with vegetation. Also worthy of exploration are the tidal flats of the Churchill River, pools, lakes, gravel ridges and, further inland, tracts of wet peat land dominated by spruce forest. Churchill is situated at 58° north latitude on the western edge of the extremely cold waters of Hudson Bay, and its climate hovers between subarctic and arctic. According to Dr. J. C. Ritchie, whose paper "The Native Plants of Churchill, Manitoba, Canada" is probably the definitive work on the subject, it is the home of nearly 150 arctic and subarctic species of higher plants, as well as many more of northern and cosmopolitan distribution.

Another factor responsible for Churchill's popularity with botanists is the practical one of its accessibility from the outside world. It lies approximately 610 air miles north of Winnipeg, whence it is easily reached by air and rail. One disadvantage of the area, a familiar one for plant collectors, in montane or northerly regions, is the short growing season, which means that the timing of one's visit is important. At Churchill the majority of species bloom between the middle of June and the latter part of July. I went for the last two days in June and the first week in July and felt well rewarded, although a visit starting a week or so later would presumably have been equally profitable.

I arrived in Churchill by 'plane with my family close to midnight on June 28th. It was dark by then so I could gain little impression of the local terrain except that it was flat and treeless, and none of the flora. This means that when we stepped out of our motel on the following morning it was to a day of utter revelation, surely the most exciting part of any holiday whether botanically oriented or otherwise. Our motel was situated on the edge of the Churchill River and our first move was to cross the peninsula on which the town and port of Churchill stands and get our first glimpse of Hudson Bay, alias the sea, on the other side. There was a cold nip in the air but the ground was in the full bloom of midsummer. We were traversing a rather flat sandy area covered with grass and low willow thickets, between the river and the railroad tracks. Everywhere we looked was the Arctic Avens, *Dryas integrifolia,* one of the most abundant and attractive of flowering plants at Churchill. Its pale gold flowers rose from mats of rolled-under, fur-backed leaves. Another striking species was the Painted Cup, *Castilleja raupii,* a fraud of a



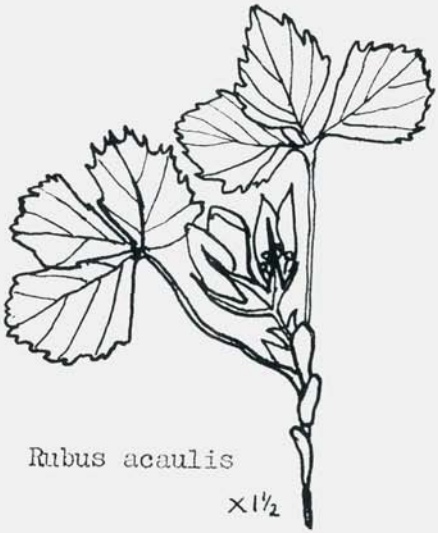
plant really for the true flower is actually hidden well inside the cluster of vivid magenta bracts which, from a distance, appear to comprise it.

We emerged on the coast somewhat to the northwest of the town's main square, walking easily over the smooth brown rocks that form a backbone to the shore. At the summit of the ridge we stood still and stared! The sight was awe-inspiring. The foreshore was strewn with stranded icebergs of all shapes and sizes, looking like weird geological formations, and out to sea the frigid blue waters of Hudson Bay were clotted with them like lumps of cream. The icebergs proved to be more solid than they looked, although every so often one would disintegrate out at sea with a noise like gunfire. Finally I managed to turn my back on this magnificent scene to feast instead upon the visual delights of the maritime rock garden. Walking up from the foreshore I noticed first of all the pale lilac flowers of *Primula stricta* occupying damp, soil-filled spaces between the rocks. The Three-toothed Saxifrage, *Saxifraga tricuspidata,* its cream-and-freckled flowers approaching the peak of bloom, formed fleshy cushions over and between the rocks along with masses of *Dryas integrifolia.* I also came across a few clumps of *Saxifraga caespitosa* nestling in sheltered rock ledges. This was a piece of luck as this species, which has solitary white flowers on glandular stems about three inches high, occurs relatively infrequently at Churchill. There were many more plants, a lot of them new to me as this was my first encounter with a flora of this kind, and I spent an hour or so scrambling about among the rocks making discoveries. Then I decided that this should be a reconnaissance trip, I would defer serious collecting until later. I wanted first of all to improvise a plant press to replace the one I'd been forced to leave behind at home. We returned to town where I begged a couple of pieces of plywood, approximately 1′ x 2′, and bought two light screw clamps from a *lumber-cum-hardware* store which, however, sold just about everything

except food and also provided banking and hairdressing facilities under its one roof! When I had obtained a stack of old newspapers from the local newsagent the press was ready for assembling; used conservatively it had just sufficient drying and storage capacity to last me until the end of the holiday.

In the afternoon we decided to sample a different habitat. Starting out from the old whale-processing shed, disused now but distinctly odiferous, we began to follow the Churchill River upstream. For a while the bird life proved more distracting than the flora. (We were not as lucky as our neighbors in the motel, however, who two days later were to encounter a polar bear ambling along the side of the river at the same spot, although the main migration of polar bears through the Churchill district does not take place until much later in the season). Eventually, we left the river and started cutting across the tidal flats making our way toward the road that links the town of Churchill with the former military camp of Fort Churchill. Further inland where the mudflats had given way to somewhat drier ground scattered with boulders and patches of willow scrub, the white flowers of the Greenland Primrose, *Primula egaliksensis,* seemed suddenly to appear all over the grass, like stars coming out in the sky. A little further on the flower heads of the False Asphodel, *Tofieldia pusilla,* were tight, cream-colored knobs, not yet open. In damper spots sedges and the Cotton-grass species, *Eriophorum angustifolium* and *E. callitrix* flourished. Between here and the road I collected a total of three different species of *Pedicularis: P. sudetica,* with purple flowers in a gray-woolly spike, *P. lapponica,* with a terminal cluster of bright yellow flowers, and one or two diminutive specimens of *P. flammea* whose helmet-shaped upper petals are yellow, tipped with purplish-black. Nearer the road the vegetation featured many of the colorful heath and heath-like plants that are typical of tundra habitats at Churchill whether these abut on the outcrop ridge or occupy extensive areas inland. Together with the faded yellow of the ubiquitous *Dryas* were the showy magenta blooms of *Rhododendron lapponicum* (Lapland Rosebay), the pink of *Andromeda polifolia* and the deep crimson buds of the Alpine Bilberry, *Vaccinium uliginosum.* In addition a fair amount of ground space was taken up by *Salix reticulata,* a prostrate, crinkly-leaved species of willow which looks more herbaceous than shrubby in habit. Now heading back toward town I stopped occasionally to investigate the water-loving species growing in or around the numerous shallow pools that lay close to the road: Colt'sfoot, *Petasites sagittatus,* coming to the end of its flowering period, and colonies of the Marsh Fleabane, *Senecio congestus,* which is even woollier and somehow contrived to remind me of fat ladies muffled up in furs! As it is with most alpine and montane flowers, hairiness is, of course, a feature common to many plants found at Churchill. (And human visitors do well to take a leaf out of the plants' book, as it were, and provide themselves with similar insulation—a thick windcheater or parka, for example, to ward off the cool sea breezes!).

The next day was again sunny and reasonably warm, and we judged it ideal for a boat trip across the river. We wanted to explore the headland which guards the entrance to the river on the western side. On it stands the landmark of the old Fort Prince of Wales, built in the 1700's by the Hudson Bay Trading Company to protect its fur empire, and now restored as a historical monument. Waiting at the harbor wall for the arrival of the motorized canoe we could



see the pale curves of beluga, or white whales, out in the mainstream of the river and the stiff forms of icebergs sailing merrily along on the tide. As we struggled into our lifejackets it occurred to me that these would be cold comfort indeed if our boat were to straddle an iceberg or a whale and tip us into the icy drink. Still, when the crossing was completed without our coming close to either hazard I realized I was more disappointed than relieved! We were landed expertly on the rocky rim of the shore and left to ourselves for a few hours. In the sand beyond the rocks grew untidy clumps of Seabeach Sandwort, *Arenaria peploides,* while the more gravelly upper part of the beach was invaded by the rosettes of *Androsace septentrionalis,* bearing aloft deep crimson scapes of varying heights and umbels of tiny crimson-and-white flowers, and by *Draba glabella,* a very common species on gravel. Growing hereabouts, and in amongst the grass of the low, undulating sand dunes, were varying quantities of three leguminous species: *Oxytropis campestris* var. *varians, Astragalus alpinus* and *Hedysarum mackenziei,* this last the most attractive with its racemes of large, silky, violet or mauve flowers. *Stelleria monantha* and *Cerastium alpinum* were present in abundance, forming webs of green growth veiled in flowers. Higher up, the grassy slope looked a bit like a buttercup meadow on account of the number of yellow-flowered specimens inhabiting it: lovely *Potentilla nivea* and its softly hairy, smaller-flowered relative, *P. pulchella* (a pair of species that seemed to me to have been named the wrong way round!), glossy *Ranunculus pedatifidus* var. *leiocarpus,* and, in a patch opposite the entrance to the old Fort, the golden heads of *Arnica alpina* subsp. *attenuata.* We spent some time inside the Fort, examining its layout, vantage points and well-preserved cannons as well as the flora of its stony interior. Then we began working our way down the western side of the promontory, first onto the pebbly shore and from there to an area of fresh-water pools surrounded by a shrubbery of large willows. Here I attempted, not altogether successfully, to distinguish the various *Salix* species by eye for collecting purposes. Crossing the promontory back to the east side again, I had to wade through a tangled undergrowth of low willows, Dwarf Birch

(Betula glandulosa), Wild Gooseberry *(Ribes oxyacanthoides)* and the brown-scurfy Soapberry *(Shepherdia canadensis)* bearing inconspicuous yellow flowers. Sheltering beneath this scrub were two particularly attractive species, *Rubus acaulis,* the Stemless Raspberry, with bright magenta petals, and *Pyrola grandiflora,* along whose racemes tight pink buds at the top graded into paler, fully-expanded flowers at the bottom. Nearer the shore the scrub gave way to the more open sand dune habitat dominated by Sea Lyme-grass *(Elymus arenarius* subsp. *mollis)* and enlivened by *Castilleja raupii, Bearberry* (possibly *Arctostaphylos rubra), Saxifraga tricuspidata, Primula stricta,* (with, however, distinctly farinose calyces), and many of the plants I'd noted earlier for this type of location on my ascent of the shore. Just before we re-embarked for an equally safe, though exhilarating boat ride home, I was pleased to come across, in bare sand, two blue-gray, glaucous clumps of *Mertensia maritima* in flower.

For our third day in Churchill we returned to the coast. This time at a point a mile or so eastwards of the town in the direction of Port Churchill. En route there I was attracted to an unmistakable specimen of *Salix arctophila* growing in gravel by the roadside, its fuzzy gray fruiting catkins stood up candelabra fashion along the thick, prostrate branches. The road led to a rather spartan cemetery of pebble graves and wooden crosses situated—ideally, many might think—a short distance from the summit of the outcrop ridge and, of course, the sea. The gentle, inland slope of the ridge supported a tundra community and here I collected *Ledum decumbens,* the narrow-leaved version of Labrador Tea, and the Rock Cranberry *(Vaccinium vitis-idaea* var. *minus),* in addition to all the heath species previously mentioned, and the Crowberry, *Empetrum hermaphroditum.* The low willow scrub, seemingly characteristic of exposed places near the sea, filled and overran hollows between the boulders at the top of the ridge. *Salix candida,* with burgeoning catkins, appeared to be most abundant, and I noted also the occurrence of a very distinct species with swollen, hairy catkins, possibly *S. calcicola.* Wet depressions and pools yielded a number of herbaceous species, of which I thought the Bistort, *Polygonum viviparum,* with its short, delicate pink flowering spikes, was the most interesting. On the seaward side of the ridge, mostly in soil-filled rock crevices, I found several plants I hadn't come across previously: the Seaside Plantain *(Plantago maritima), Lychnis affinis,* with white corolla just peeping above the purple-tipped calyx, and the creeping rhizomes of *Chrysanthemum arcticum,* whose leaves and flowering stems seemed to have bits of cotton wool sticking to them! Within one small area, too, I was delighted to find several tufts of a tiny saxifrage, that I think was the relatively rare Alpine Brook Saxifrage, *Saxifraga rivularis,* which had thin, trefoil leaves about 5 mm. across and some spade-shaped ones. I was subsequently disappointed not to have come across the remaining three species recorded from this area, *S. aizoides, S. hirculus* and *S. oppositifolia,* during my stay in Churchill. Since all are apparently common I can only conclude that I overlooked them because they were not in flower.

Cape Merry, the northwestern extension of the Churchill peninsula, is probably the best single locality in the district for plant collecting. It is a wild, exposed, and very beautiful stretch of outcrop ridge which also encompasses sandy beaches, dunes, peaty ground and pools. Unfortunately it

was cold and pouring with rain on the day I set aside for visiting it. It was hardly the kind of weather conducive to a careful search for new species, for by now I was familiar with the more widespread elements in the flora and was looking for novelties. Still, I did manage to make some additions to my collection. The road to Cape Merry leads behind the harbour and the huge grain elevators that dominate the skyline for miles around that flat peninsula. I had, incidentally, explored the harbour area on the previous day and noted one or two items of interest. *Potentilla multifida* grew in clumps in a bank of Sea Lyme-grass close to the harbour wall. Like those of *P. pulchella,* the flowers of this species, with their small, readily caducous petals, tended to get lost amid the numerous divisions of the foliage, which is dark green above and silvery hairy beneath. A little further on my attention had been attracted to dense stands of *Thlaspi arvense* and other weeds which were growing out of a carpet of spilt grain around the base of the grain elevators. They created the illusion of a patch of prairie farmyard which seemed very out of place in maritime surroundings!

Further along the road to Cape Merry on a rise leading up to the television station and antenna, a pale green patch of a River-beauty, *Epilobium latifolium,* caught my eye. It was, however, so immature that I wasn't able to identify it immediately. I continued to follow the windings of the road and at last emerged upon the ridge proper, in the area designated Cape Merry Centennial Park, whose sea-bound extremities were now lost in a blur of mist and rain. Here most of the tundra species were present, including masses of stiff, bunchy, grey-green reindeer moss and a variety of rock-encrusting lichens which here seemed especially conspicuous on account of their luxuriant growth. At various points along the gravel roadside I collected *Achillea borealis,* yellow-flowered *Draba nemorosa* var. *leiocarpa, Descurainia sophia* and the Goldenrod species *Solidago multiradiata,* with flowering heads not yet fully unfolded. In damp, peaty soils on the ridge I noted the occasional Cloudberry, *Rubus chamaemorus,* its very attractive, white-cupped flower shyly hugging the ground, and The Blunt-leaf Orchis, *Habenaria obtusata,* still mostly in bud. In damp, sandy spots, often close to the edges of pools, I found the Seaside Crowfoot, *Ranunculus cymbalaria,* tiny and trailing, and, alongside one small pool, a few pale yellow flowers belonging to *Anemone richardsonii.* (Two days later, its taller, leafier and hairier relative, *Anemone multifida,* had the distinction of being my last 'new find' at Churchill. I came across it, apparently newly in bloom, in the sandy dune area not far from our motel).

There was still one other major habitat at Churchill that I was eager to investigate—the area of coniferous forest or muskeg which begins a few miles upriver and thereafter continues, interspersed with tundra, for many miles inland. To reach it we took the bus which plies between the town square and Fort Churchill, calling en route at Akudlik, the Eskimo village, and Dene Village, the Chipewyan Indian community. At the latter stop we got off and began to walk down a road which obviously led to the river, crossing the railroad track and continuing until we came to an area of gravel pits surrounded by forest. The thinly spaced, impoverished-looking trees reminded us forcibly that we were in treeline territory, yet at the same time the delicate, bright green veils of the deciduous tamarack *(Larix laracina)* contrasted

pleasantly with the close, dark spires of the black spruce, *Picea mariana.* The forest floor was a mosaic of dry, licheny patches supporting Labrador Tea *(Ledum groenlandicum),* Northern Comandra *(Geocaulon lividum)* and a few other species, and wet sphagnum-filled hollows where *Tofieldia pusilla* and *Habenaria obtusata* grew in relative abundance. The pale green rosettes of the Butterwort, *Pinguicula vulgaris,* were also much in evidence, although only the odd one bore a flower, breathtaking and brilliant as a gem. In this general vicinity I added three more *Salix* species to my collection: *S. planifolia, S. myrtillifolia* and the interesting *S. vestita,* whose leaf under-surfaces are covered in long white hairs as smooth as the inside of an almond. Such species as *Solidago multiradiata, Senecio pauperculus* and *Barbarea orthoceras* were fairly common, chiefly in the dry soils alongside the road or in the gravelly clearings. Unfortunately the enjoyment of botanizing in this type of country was greatly marred by the mosquitoes which always abound in muskeg during the summer months and whose activities were especially favoured on this day by the cloudy, overcast weather. I realized then how much I had failed to appreciate the near absence of this "scourge of the Canadian north" on my collecting trips along the coast.

The following day was our last one in Churchill and I packed up with some reluctance, feeling that I had come to grips with only a fraction of the Churchill flora, and that a lot remained for me to discover and learn. (This wasn't surprising, of course; I'm sure it would take a full season's visit or at least a succession of visits to do botanical justice to the place!). In the late afternoon we took the train out of Churchill and watched the long northern evening fade slowly into night as we moved southward across the tundra. We

Salix arctophila

Chrysanthemum arcticum

reached the nickel-mining city of Thompson, 400 miles north of Winnipeg, early the next morning. We had decided to break our journey here and even with showery weather the stopover proved worthwhile. In or around the edges of patches of spruce forest, all located within the confines of the town, I found a number of attractive plants, chief among them were: Bishop's-cap, *Mitella nuda,* Honeysuckle, *Lonicera dioica* var. *glaucescens,* Columbine, *Aquilegia brevistyla,* Wild Strawberry, *Fragaria virginiana, Moneses uniflora, Pyrola asarifolia, P. secunda,* Grass-of-Parnassus, *Parnassia multiseta,* and the Northern Green Orchis, *Habenaria hyperborea.* We were very impressed, too, by the compact stands of spruce, pine and aspen which grew around Thompson; after Churchill's stunted conifers they seemed to us toweringly majestic! From Thompson it was but a short 'plane ride home, where I soon set about relieving some of the pressure on my bulging plant press. After that I settled down to sort through my dried specimens and find or check their identity at my leisure. By the time they were all mounted as a record of my plant collecting forays I felt that I had lived my holiday in Churchill several times over!

Reference: Ritchie, J. C. (1956): The Native Plants of Churchill, Manitoba, Canada. Can. Jour. Bot. 34: 269-320.

Acknowledgement: To the Botany Department of the University of Manitoba, Winnipeg, for help with identification.

LOBELIA CARDINALIS AND *LOBELIA SIPHILITICA* HYBRIDS

VIKI FERRENIEA, *Framingham, Mass.*

Around the pond at Garden-in-the-Woods, *Lobelia cardinalis* and *L. siphilitica* grow in profusion. Among the approximately five to six hundred plants, of the only ornamental Lobelias grown at the garden, are the pure white forms of both species. A number of intermediates between the red and white forms of *Lobelia cardinalis* are noticeable: white with distinct pink stripes, white with pink spots, and several with pale pink flowers. Some of these color forms do not appear stable, varying from year to year.

Two years ago I noticed a very dark rich purple-flowered *L. cardinalis.* From this vigorous, healthy plant I removed some of the small side shoots which arise in the leaf axils, for propagation purposes. Unfortunately, these all damped off in the first ten days. From seed collected that fall those that have flowered have produced all scarlet flowers.

In the summer of 1973 I noticed, not two feet from the purple *L. cardinalis,* a small three-stemmed mature plant of *L. siphilitica* with pale purple flowers. The appearance of this plant, the second to exhibit purple pigmentation, made me realize that never before had I seen nor read about hybrids between these two particular species; in fact, I had been given to understand that they did not occur. The flower form of both of these purple-flowered plants is typical for its species; only the color varies from the normal, and to obtain purple flowers there must be at least a basic color mix of red and blue. Whether the white forms are involved is a question.

Wanting a confirmation of my conclusion, flowers of each were sent to Dr. Edgar T. Wherry who confirmed that these purple-flowered forms were indeed hybrids. What puzzles me is why such color forms have not occurred before in this colony. Have they shown up in any other gardens?

For me nothing could surpass that vivid summer beauty of the cardinal flower but the purple forms do add additional interest and are a conversation point in a collection.

DISTURBING THE ENVIRONMENT

NORMAN C. DENO, *University Park, Pa.*

A prevalent thesis of many of today's environmentalists is that disturbances by man are necessarily and invariably destructive to plant life. Such a thesis could never have been the product of one who truly loves and observes the flowers of the wild, for the truth is that most of our most beautiful wild flowers are children of disturbance, and then afterwards, turn to the effects of isolation and non-disturbance.

In my own county (Centre County, Pa.), large patches of cranberries grow on gravel flats where the Red Moshannon Creek enters the West Branch of the Susquehanna River. Now cranberries are lovers of moisture and highly acid soil, and the West Branch of the Susquehanna is notoriously acidic from acid mine drainage. It is not my thesis that rivers should be acidified to promote the growth of cranberries, but the fact is that the cranberries with their beautiful evergreen foliage and interesting flowers are a product of the acidity. Maybe once in a while, if such an acid situation develops, we can enjoy and appreciate a sort of silver lining to the cloud of acid mine drainage which is the case in one of our floral treasures, the cranberry. The only other stand of this plant in our county is also a product of man's disturbance. Iron ore was mined in a town named Scotia. The town is long adandoned and not a house remains, but the brown gravel and tailings, highly acidic, nurture the cranberry about each pool and pond.

Another beautiful plant, the quaking aspen, owes its existance to the same cause. As the cranberry captures the bog margin, so the aspen conquers the ridges. Everyone with an eye for nature can see the aspen groves developing on the old strip mine tailings along I-80 and who is to say that a grove of aspens is not a thing of beauty? The abandoned strip mine offers a transient home for the ever trembling aspen, ultimately to be destroyed in the climax forest centuries later.

A remarkable example of our thesis was observed in the two Bennett bogs in southern New Jersey. These are the lone New Jersey stations of one of our most beautiful native orchids, *Habenaria nivea,* the snow orchid. One of the two bogs was purchased by a nature society and "protected" by banning the yearly hay cutting practiced by the local farmers. When I visited these two bogs in 1971, the snow orchids had become scarce in the protected bog, but were beautiful and flourishing in the unprotected bog. How could such good intentions have gone astray? I suspect that the yearly hay removal kept removing nutrient, kept the grass somewhat impoverished, and prevented grass from becoming king. I have since heard that the nature society has re-

instated the hay cutting in a frantic move to recover the snow orchid.

Cypripedium acaule, the pink lady slipper, is unquestionably one of our most beautiful wild flowers, but it is a fickle queen. At a number of places in our county it has invaded maturing pine plantations and clearly owes its abundance in these to man's planting of the pines and removal of the normal climax hardwood forest.

Another Pennsylvania beauty is *Silene pennsylvanica,* my own favorite Pennsylvania wild flower. Where does it grow? It is a child of man's disturbance and colonies may be found on road cuts near Black Moshannon, on rock faces resulting from road construction near Amity Hall, and on a cliff face chiseled out in the construction of Colyer Dam. *Silene pennsylvanica* is a delightful bonus from such disturbance.

Old abandoned sand quarries such as are found near Mount Union, Pa. or along I-75 in Michigan might be argued as eyesores by some. I see something entirely different. I see colonies of *Spiranthes cernua* (our ladies' tresses orchid), *Goodyera pubescens* (another small orchid), and *Sabatia angularis* (a gorgeous pink member of the gentian family) finding a home to grow and flourish for a few centuries before finally yielding to the advance of trees and grass.

In fact, the most beautiful specimens of our wild flowers are usually found along the disturbed ground of roadsides. A clay bank is studded with brilliant cerise bouquets of *Townsendia sericea* on Route 14-A in the Bighorns. *Aquilegia jonesii* (the most delightful and the most dwarf of all columbines) is at its finest in roadside rock ballast in the Bighorns. *Gentiana crinita,* the fringed gentian, is in roadside gravel in our county. The neon blue of *Penstemon caryi* and the salmon pink mounds of *Penstemon laricifolia* are abundant along Route 14-A on the west slope of the Bighorns, but a few feet back in the sagebrush, they are no longer to be found. Old hands at this game know that the finest *Polemonium viscosum* (the blue sky pilot), *Draba densifolia, Mertensia alpina, Phlox multiflora,* and many others of our finest alpine tundra plants are at their best on shoulders of abandoned roads in the Beartooth Plateau. The only stand of *Trollius laxus* (a large buttercup) that I have seen is on a regularly mowed road bank in northern New Jersey. The finest stand of the fire pink *(Silene virginica)* was seen in gravel tailings of road building in Virginia. *Oenothera caespitosa* (the great white evening primrose) was spreading all over a gravel road cut in Colorado and is well known to favor loose disturbed soil. Similarly, *Oenothera pallida* lined the roadside with its bouquets of white flowers near Smithwick, South Dakota.

But what of protected areas where man has isolated an area from disturbance? The climax vegetation takes over and while acres of virgin hemlock (Cook Forest, Pa.) and lodgepole pine (Yellowstone Park) have their own beauty, and we must have them too, the fact is that such forests are botanical deserts. Only a few feeble Oxalis grow at the hemlocks' feet and virtually nothing can survive the onslaught of the lodgepole pine.

A combination of protection plus disturbance can bring to us all of the beauties of the plant kingdom. I dream of the day when our wild flowers will be managed like our animals of the wild with protection, encouragement, and even stocking. Maybe then will our most beautiful orchid, the queen's lady slipper *(Cypripedium reginae)* grace the moist areas of my Pennsylvania road-

sides. But this will require a much deeper love of plants and a much deeper appreciation of their needs than evidenced and it will need a day when everyone comes to realize that no plant benefits from picking of the flowers and that such picking is pure destruction.

HERESY AND SUCCESS IN A ROCK GARDEN

RALPH BENNETT, *Arlington, Va.*

I will never forget my fascination in looking over Linc Foster's fantastic and intricate structures, for which I can find no adequate name, in which he raises a bewildering collection of rare and difficult alpine treasures. Being a "nut" on Penstemons, I could hardly believe my eyes when I saw him growing in quantity and with apparent ease a species that I had always assumed to be impossible outside the western deserts, namely, *Penstemon exilifolius*. I had tried it and failed and didn't dream of trying it again. Saxifrages are just as easy for him as Columbines, impossible to me, from seed. His garden represents to my way of thinking the ultimate at one end of the scale of rock garden plant growing; the top end.

What would be a garden at the opposite end of the scale, the low end? If you would really like to know, come and look at mine. My rock garden is a hundred feet long and four to eight feet wide, but it contains very few of the choice and difficult species of alpines that those in the rarified atmosphere of the Foster garden are almost confined to. One excuse for this that I could give is that the climate of northern Virginia is altogether different from that of Connecticut. Connecticut has a climate that is just made to order for raising and growing alpines. Virginia has a climate that is more adapted to the growing of sweet potatoes. Well, maybe not quite that bad, but it is a far cry from the ideal conditions of New York to Maine. A few years ago, when I used to get a lot of rare alpine plants every year in the plant exchange of the Potomac Valley Chapter of the ARGS, my rock garden would be full of choice plants every fall but only half full in the spring. Fully half of the difficult plants had died during the winter. Most of the members in my chapter reported the same thing—people smarter than I. And that wasn't all. Every spring we get three months of almost constant rain and cloudy skies. Any difficult plants that have survived our winters are killed during this rainy period. It has to be a tough alpine that can survive such conditions. The easy ones can, but not the difficult ones.

Another reason for not trying the difficult alpines is that after trying to germinate the seeds for twenty years, I gave it up as a hopeless task in my climate. I do not have the elaborate equipment that most of you people have. My equipment consists of two seed frames 3 by 6 feet in size, built of cinder blocks sunk 8 inches in the ground, with a wire mesh in the bottom to keep out moles, and containing a 6-inch layer of good seeding soil, made up of sifted loam, coarse sand, and vermiculite. The frames have removable covers of plexiglass. In late fall I sterilize the soil with Vapam, and then let it lie, under the plexiglass covers, until spring, with no further attention.

During a warm spell in February (we can always count on having one)

I plant my seeds. I divide the surface of the beds into rectangular blocks with half-inch strips. I scatter the seeds on the surface of these blocks and just cover them with a sprinkle of sand. I water them in with a solution of Benlate, the new miracle fungicide. When the seedlings start to appear, I water the soil again with Benlate. Again, when the seedlings are all pretty well up, I water them a third time with Benlate. The Benlate is to prevent damping off. (It really does. I haven't had any damping off for years). Another name for Benlate is Benomyl. While the seedlings are growing I water them a few times with a solution of Hyponex or Rapidgro. Germination for me so far has been good, though I do not claim to be able to germinate difficult alpines. This does not worry me. I am of an easy disposition, I guess.

Nearly all my rock garden friends have a philosophy just the opposite of mine. I don't know whether I am the only one with this philosophy in the whole Rock Garden Society, but I'd be willing to bet that there are not many. My friends, when they pick out the seeds that they are going to plant, seem to me to show a preference for the rarest ones, whether they know them to be difficult or not. They turn up their noses at the ones that are most popular in each genus. They want to get plants that they haven't grown before. Not I. I choose only those that have two and preferably three donor numbers after them in the Seed Exchange List. (If this year's list doesn't show the donors, I look at a previous list). I figure that if so many people grow these kinds, it is logical to assume that they are not only desirable but relatively easy to grow. By coming down off my high horse and being satisfied to grow the easiest species in each genus I stand a fair chance of having my rock garden beds filled with plants at all times, instead of having to make excuses for a lot of blank spaces where difficult plants have died out.

You might argue, "Yes, and you could also have the beds filled up if you just grew a lot of weeds." My answer would be that a selection of the most popular species in the various rock garden genera would not make a garden of weeds; it would make a garden of pretty good rock plants, good enough to satisfy a gardener who is willing to be without many rare plants and who is compelled to garden in an unfavorable climate. They must be good plants or they would not be popular. That makes sense to me. Also I achieve one other thing. When I send in my list to the Seed Exchange, I know that I am going to get nearly all of my choices. Before I started this policy I had to face the disappointment every year of not getting what I asked for in half the cases.

You might argue, again, that a garden containing only the popular species of rock plants would not attract visits from my rock garden friends because they would not see anything new. They would see Penstemons and they are new to most gardeners. Anyway, I am the one who has to look at the garden every day and if I like it this way and get a whole lot of pleasure from it, why should I be so concerned about what other people like? In this part of the country people don't visit much anyway. It isn't like New England.

Like all gardeners, I am not entirely consistent. You might find a few difficult plants in my garden. If you do, they are usually plants that I obtained at our plant exchanges which were grown by these typical rock gardeners who always order the unusual, often difficult, seeds. The chances are that these plants will disappear of their own accord in a couple of years because of not being able to tolerate our climate. And after I have made my main choices,

I may order seeds of a few unusual species of genera that I know to be relatively easy if I haven't gotten up to my 32 packets yet. But I stay clear of the genera or species that I know are really difficult.

I used to think that the way to get rock plant seedlings to maturity in this climate would be to use some kind of highly sophisticated, modern method which would be so superior to the old-fashioned methods that it would make it possible for me to defy the elements. An example of these modern methods is Jiffy Sevens. Reading the descriptions of gardeners in other regions of their experiences with Jiffy Sevens, I naturally thought that they would eliminate all my difficulties. I achieved nothing but massive failure with them. I hope you will believe me when I say this does not indicate that I am stupid. It indicates that methods which will succeed in Connecticut will not necessarily succeed in Virginia.

I said above that I get good germination. But so do a lot of other people who have to end their tale of success right there. Being a member of fifteen round robins (correspondence circles) of gardeners, I am constantly reading the complaints of people who obtained good germination but lost nearly all their seedlings in the process of getting them to maturity. I was one of them until lately. I have licked that problem now, at least for the kinds of rock garden plants that I am satisfied to grow. I use no modern methods, no Jiffy Sevens or other sophisticated devices.

I have a transplanting bed 20 feet long and six feet wide, filled with 6 inches of coarse sand. It is in a place that gets sun about half a day. I let the seedlings get as large as seems advisable, that is, just before they start dying off from overcrowding. I then pot up each seedling in a 2¼ inch plastic pot, in just plain soil (garden loam or clay) mixed with an equal quantity of sand and with some sifted compost mixed in. I don't sterilize it, and I don't use any fertilizer. I have a little watering can such as women use on house plants, and as I pot up a seedling I pour a little water into the pot. Then I sink the pots in the sand bed close together but with a little distance between them so the sand can surround the pots. At the end of each transplanting day I water the whole assembly with a sprinkler nozzle on a hose. The seedlings never wilt, not even right after being potted. After the seedlings are all potted and in the sand bed, I water the whole bed once every other week during the summer with the hose. I do not do any feeding.

By August the seedlings have all grown into nice healthy plants. Even plants six inches across seem satisfied to stay in those tiny pots and do not show any signs of suffering. In September they were ready to set out in the garden without any sign of wilting. This year I took two hundred of them to the plant exchange of my chapter, after planting a hundred of them in my own garden. There is magic in a sand bed. I cannot explain it, but I can certainly take advantage of it.

Another heretical practice in my garden is that every winter I allow the leaves from my 15 oak trees to flutter down on my rock garden and stay there. I even add other oak leaves until the layer is about two inches thick. The rock plants love it. In the spring, in April, I take the leaves off and find all my precious rock plants still with me and smiling up at me, instead of my having to bear up under the sight of every other plant having disappeared during the winter. I do not have any trees other than oaks. Other kinds of leaves become

soggy during the winter and would not be good to leave on the beds.

The title of this article is "Heresy and Success in a Rock Garden." The heresy is my spurning the unusual and difficult species and growing only the popular ones unless some rare ones are given to me. The success is that I get my seedlings to maturity in from 50 to 100 percent of the cases, averaging 75 percent; and they are all types of plants which are popular with nearly all rock gardeners and therefore likely to stay with me and thrive. My rock garden is always full of plants now, instead of being half empty, as it used to be when I was a typical rock gardener.

EDIBLE BERRY-PRODUCING PLANTS OF THE PACIFIC NORTHWEST

GUS N. ARNESON, *Seattle, Wash.*

Plants of the Pacific Northwest that produce edible berries generally rate high marks for beauty and adaptability to the requirements of gardeners. Foliage, flowers and fruit are attractive both in their native habitats and in the well-planted garden. It is interesting to review these shrubs that provide nourishment to both body and soul.

In this discussion our attention will be confined to plants of that verdant strip between the summit of the Cascade Mountains and the sea that extends through British Columbia south to northern California. This limitation is a matter of convenience and it is recognized that some of the species discussed flourish outside these boundaries. By edible we mean that the berries not only can be, but have been, eaten in significant quantities by people. They range in flavor from insipid to delicious but even the less flavorful were once esteemed as important items of diet by Indians of this area. On the criteria of edibility we run some risk of omission through ignorance. It is, for example, a little surprising to find that the coral red fruit of *Cornus canadensis* L.* is edible, but it is. This charming little denizen of cool mountain forests which flourishes in many gardens of the U. S., Canada and abroad is listed as an emergency food (4)** and Haskins (2) writes: "These berries, though somewhat insipid, are edible, and are still an article of diet among coast Indians of British Columbia. The white men of northern New England also use them as an ingredient in plum duff, and call them pudding-berries."

Gaultheria shallon Pursh, Salal, is one of our finest ornamentals. It is characterized by foliage that is handsome throughout the year, waxy, white and white-tinged-with-pink urn-shaped flowers followed by purplish-almost-black fruit which is good to see and moderately good to eat. Hitchcock (3) writing of Gaultheria L., says: "All excellent ground covers; *G. shallon* the best." It is reported that David Douglas (2), after landing at Bakers Bay on the Columbia River in April of 1825 and seeing Salal wrote: ". . . so pleased was I that I could scarcely see anything else."

Berberis L. (Mahonia Nutt.) Oregon Grape, is represented by two fine ornamental species that could find an appropriate place in any garden. They have somewhat holly-like leaves that are green and shiny the year around; yellow flowers in attractive racemes during the spring; followed by blue berries in clusters that are as ornamental as the blooms. *Berberis aquilifolium* Pursh

is the highest (3 to 6 feet) and perhaps the most beautiful although its low-growing relative, *B. nervosa* Pursh (less than 2 feet high) needs no apology for its pulchritude. These are not grapes but produce excellent jelly with a genuine wild grape flavor. They were a source of food, dye, and medicine for the Indians.

The genus *Rubus* L. is impressively represented by *R. leucodermis* Dougl., Blackcaps or Black Raspberries; *R. parviflorus* Nutt., Thimbleberry; *R. pedatus* J. E. Smith, Strawberry Dwarf Bramble; *R. spectabilis* Pursh, Salmonberry; *R. ursinis* Cham. & Schlecht, Trailing or Pacific Blackberry. These are all beautiful in their proper settings, have attractive flowers and produce edible fruit. All except, perhaps, the Dwarf Bramble require more space than is normally allotted to plants in the rock garden although there are none that would not be attractive as background plantings in moderately large gardens. The flavor of their fruits is not uniformly attractive. The Dwarf Bramble, of course, is exquisite; pies and jam made from Trailing Blackberries are among the best that nature produces; Blackcaps are good; Thimbleberry and Salmonberry are somewhat insipid. Not one of these species, however, but does not quicken the pulse with pleasure when encountered in its native haunts during spring, summer, or autumn.

When we come to the genus *Vaccinium* L., our Western Huckleberries,

Vaccinium ovatum Pursh—Evergreen Huckleberry

The Author

Rubus parviflorus Nutt. The petals of thimbleberry have been likened to soft, crinkled tissue paper.

The Author

we are almost bemused by the number of species, the variation of their habitat, and their physical forms. Ground covering dwarfs to plants 6 feet high; natives of bogs, coastal forests, high altitude forests and mountain meadows and slopes above timberline; deciduous and evergreen, fruit red, blue, purple and black. Two characteristics the species have in common; their fruits are well flavored —some superlatively delicious, and they are ornamental.

Some of the species are such look-alikes that only specialists can tell them apart and even they, sometimes, with difficulty. The dainty dwarf *V. myrtillus* L., *V. caespitosum* Michx., *V. deliciosum* Piper, that cover steep mountain slopes and alpine meadows are readily recognized as a group although perhaps not so easily distinguished one from another. When, in September and October, the high country appears to be spread with Persian carpets of orange, lavender, and red it is pretty certain that the warp and woof of the covering are these hardy little mountaineers and the gorgeous coloring is from their autumn leaves.

In the cool forest more nearly at the level of the sea are two plants that anyone can recognize: *V. parvifolium* Smith, the Red Huckleberry of which Hitchcock (3) writes: "A most attractive and versatile ornamental", and *V. ovatum* Pursh, the Evergreen Huckleberry, described by Haskins (2) as ". . . beautiful at all seasons, but when it is covered with its pinkish, waxy, bell-shaped flowers, or bending beneath a load of blue-black fruit it is exceptionally pleasing." *V. oxycoccus* L. dwells in swamps and sphagnum bogs. Throughout the forests of higher elevation and climbing up exposed ridges and sunny mountainsides are *V. uliginosum* L., *V. globulare* Rydb., *V. membranaceum* Dougl., *V. alaskaense* Howell, and *V. ovalifolium* Smith. Some of these are difficult to distinguish without careful examination. The

Gaultheria shallon Pursh, Salal, growing in the stump of a Douglas fir tree, *Pseudotsuga menziesii,* that was felled about sixty years ago.

The Author

typical huckleberry picker cannot call these various species by name and does not much care. The berries are all tasty and go into the same bucket. Experienced pickers know, however, that the fruit of some plants is more juicy, sweeter, and of higher flavor than others which leads them to favor, for example, the reddish purple fruit of the crooked, smooth-barked, thin-leaved *V. membranaceum* Dougl. which, fortunately, is one of the most abundant species.

Readers not acquainted with the West are entitled to a word of caution. The huckleberries of eastern North America are of a different, although closely related, genus from the Vacciniums. As Mary A. Fries (1) so aptly writes: "Huckleberries that are huckleberries to the easterners do not grow in the Northwest. We have only Vaccinium—Blueberries—except that they are as apt to have red or black berries as blue ones."

We have introduced ten species that ornament the Pacific Northwest. If they are not already your old friends you should get to know them better. They will give you gastronomic and aesthetic pleasure.

*Technical names used in this paper are all from Hitchcock and Cronquist, *Flora of the Pacific Northwest,* 1973.
**Numerals in parenthesis indicate references at the end of this article.

(1) Fries, Mary A. *Wild Flowers of Mount Rainier and the Cascades.* 1970.
(2) Haskins. Leslie L. *Wild Flowers of the Pacific Coast,* 1934.
(3) Hitchcock C. Leo & Cronquist, Arthur, *Flora of the Pacific Northwest,* 1973.
(5) Martin, George W. & Scott, Robert W., *Food in the Wilderness,* 1963.

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A LETTER OF APPRECIATION FROM MRS. BARRON—Mrs. Muriel T. Barron, Downsville, N. Y. 13755 asks that the following portion of her letter to the Editor appear in the *Bulletin:* "I was overwhelmed by the friendliness and helpfulness in the many letters I received in response to my original letter published in the *Bulletin* of October, 1973. Although I still feel my very great lack of experience and knowledge, much stronger is the feeling of morale support from members who have gone through the same fearful beginnings or who were willing to share their experience and specific information. I was sent articles and booklets as well as lots of sources of information, good books, seedsmen and gardens to visit. Many people invited me to visit them if I could. I feel that I have found a wonderful new world of friends not only in this country but across the ocean and if I never succeed in becoming a rock gardener it will have been a most heart-warming experience and worthwhile beyond measure just to have known that people such as the good members of the ARGS do exist. Many thanks to you all.

* * * * *

PERHAPS A SECOND VOLUME OF THE ARGS ROCK GARDENER'S HANDBOOK?—A member writes ". . . the *Bulletin* is eagerly awaited as it is a delight to read and reread. The Seed Exchange is tremendous, but overpowering in its selection. I have been contributing wild flower seeds of my woodland plants and perhaps in a year or two I shall be donating other seeds as well and who knows I may be able to contribute something to the *Bulletin. The Rock Gardener's Handbook* must certainly be the best book bargain, bar none, in the gardening field. Are there plans for collecting other articles into a 2nd volume . . .?"

IN MEMORIAM – DWIGHT RIPLEY

Dwight Ripley died November 17, 1973 in the hospital at Greenport, Long Island, New York.

It was there in Greenport, on the North Road at the edge of town that he and his associate, Rupert Barneby, presided over a fabulous garden; a small enclosed garden of exquisite proportions and design filled with a stunning collection of alpine plants. This was the last of a series of unique and beautiful rock gardens that Dwight Ripley lovingly tended.

He began his gardening in England where he was a highly admired member of the Alpine Garden Society, an acknowledged expert on the flora of the Mediterranean region, into many parts of which he made plant exploring trips, and about which he wrote for the *Bulletin* of the AGS eloquent and charming articles. It was Dwight Ripley who first devised the tufa wall with a cantilevered roof for the successful growing of difficult alpines in England, a scheme still successfully employed in that country.

In America Dwight Ripley discovered a propitious site near Wappingers Falls, N. Y. where broken outcrops of tilted shale offered another adventure in rock gardening. Explorations into southwestern United States and the mountainous regions of Mexico provided a whole new realm of plant species, little known to botany and not at all to rock gardening. Adventures afield and the growing of American alpines in the new garden provided the material for a series of stunning articles in the pages of the ARGS *Bulletin*. It was as though we had a resurrection of Farrer himself in our own midst.

A later move from the Hudson Valley shales to the sandy reaches of the northern fishtail of Long Island presented a real challenge. There a conventional and pleasing rock garden was constructed of transported rock. The vagaries of the climate were met and defeated, but there were no basic compromises and not complete satisfaction.

Slowly there evolved an entirely new sort of rock garden. At the far end of a long panel of lawn running to the west of the house, in front of the boundary hedgerow of tall pines, a wall was constructed of concrete blocks which in general outline formed a great letter E without the central interior spine, a shape somewhat like a square C. The walls were ten feet high or so, the back wall, facing east, about 30 feet long and each wing about 15. But the wall was in no way a plain and even façade. There were setbacks and juts so that the play of light and shadow on the face, after it had been painted white, gave strange and wonderful dimensions to the whole structure, all exquisitely proportioned.

Out about three feet from this wall was another wall, more regularly constructed of the same white-painted concrete blocks, this one about three and a half feet high. And between these two walls a soil mix of subtle proportions formed a deep bed, a table garden with three different exposures. With some carefully placed stones on the surface and a few carefully selected and placed dwarf trees silhouetted against the white background, this was an utterly unique rock garden.

The success of the scheme led to other developments of equal ingenuity

and beauty. The interior space, carpeted with fine white beach sand, was furnished with large individual planters contrived from standard concrete structures such as chimney tiles, septic tanks, and large conduit sections. Each was a small botanical environment. Eventually the whole area was enclosed by a lower front wall of filigree pierced concrete blocks with side passages and entrances as into a secret and special garden, a modern Alhambra.

Dwight Ripley was a man of fecund imagination, profound knowledge, of exquisite taste; botanist and plantsman, artist and lexicographer, author and linguist. He was shy and modest, generous of his talent and resources, spendthrift of a rare and precious substance. We are all immensely bereft.

H. Lincoln Foster, *Falls Village, Conn.*

IN PURSUIT OF CASSIOPE

SALLIE D. ALLEN, *Seattle, Wash.*

Twenty years ago when I first became seriously interested in Cassiopes, the genus was little known or grown in this part of the country. I had long been charmed by our own *Cassiope mertensiana,* actually dating back to childhood camping trips to sub-alpine meadows of the Cascades. These small heath-like evergreen shrubs with pert white campanulate flowers seemed to me the most delightful members of the entire Ericaceae family. Over the years many meaningful friendships have been established with people in this country and abroad through my search for information, and because of the generosity of these friends, numerous species and hybrids found their way to my garden. In addition to these is my own selection of native species, varieties, and interesting variants, forming a fairly comprehensive Cassiope collection.

As always happens in the educational process, the more you learn, the more you realize how little you know, and the knowledge you acquire is diminished somewhat by the overwhelming realization of how much there is to learn. Eventually you not only begin to question your own observations and conclusions but also the scientific information, or lack of it. The inquisitive amateur has an added frustration of realizing his limitations due to lack of botanical background and training. However, I do feel that the layman can contribute to the scientific field of knowledge because he not only seeks out and selects, but grows the plants, compares and observes their habits over a long period of time. He also can propagate and distribute rare plants through those who share his common interest, as there is no greater joy than sharing the bountiful fruits of a labor of love.

In Great Britain a number of splendid garden hybrid Cassiopes have become well known, proving to be easygoing, free-flowering, first rate garden plants with none of the miffiness of one or both of the parents. Two examples are *Cassiope* 'Muirhead' (the Tibetan *C. wardii* x *C. lycopodioides* of Japanese origin) and *C.* 'Edinburgh' (*C. fastigiata* from the Himalayas x *C. tetragona,* circumpolar in distribution). The question often asked me is, "Does natural hybridization take place between the western North American species?" It is a good question that I have asked myself and many others; answers I cannot give you, only observations.

Three species of Cassiopes occur in the state of Washington, *C. saximontana* (*C. tetragona* var. *saximontana* if you prefer) known from only three stations in Okanogan County, *C. mertensiana* and *C. stelleriana*. The latter two often occur together on the western slope of the Cascades as far south as Mt. Rainier, the southernmost known limit of *C. stelleriana*. I have never seen evidence or heard of hybridization between the two. I do not think any determination has ever been made whether the two are capable of hybridizing. Perhaps *C. stelleriana* should be gently removed from the genus and placed in *Harrimanella* where many botanists feel it more appropriately belongs. This, of course, is a scientific determination up to the botanists to resolve. Tiffany Mountain, one of the described stations of *C. saximontana,* is where I have found that species (subspecies or variety) growing in two locations, a small colony on the western slope of the mountain and at Tiffany Lake.

At least three species of Cassiope occur on the Mendenhall Glacier flats near Juneau, Alaska, *C. stelleriana, C. mertensiana* and the American form of *C. lycopodioides*. I say "at least" because there is the possibility of *C. tetragona* growing there, although it is probably at a higher elevation. Unfortunately, my only trip to Juneau was twenty-three years ago when my interest in the flora was somewhat superficial.

Our family holiday (September 1—14, 1973) presented an opportunity as we were spending our vacation in Canada. Our plan was to drive up Caribou Trail north to Prince George, then turn west and northerly on the Yellowhead Highway* to Prince Rupert on the West Coast of British Columbia. Daughter Sue who had spent the summer working in Ketchikan, Alaska was to arrive via the Alaska ferries in Prince Rupert on September 7th. This gave us a week to drive the 1100 mile distance, allowing time to fish, explore etc. We took sleeping bags and camping equipment in the event of pleasant weather; otherwise we would stay in housekeeping motels. I would far rather sleep under the stars and cook over a wood fire. However, the weather was cool, overcast and sometimes quite wet. We managed to picnic during the days, but stayed in motels overnight. Camping, picnic and motel facilities were superb all along the way and the highway excellent, with the exception of a few places where highway construction was under way.

We spent two nights in Smithers, 1627 feet elevation, beautifully situated in the Bulkley River valley, surrounded by snow-peaked mountains. It is approximately half way between Prince George and Prince Rupert and as the crow flies, roughly 500 miles north of Seattle. The town of Smithers is at the base of the beautifully glaciered 8700 foot Hudson Bay Mountain. Although this was a family holiday, not a plant hunting trip, I did want to spend some time up the mountain because four *Cassiope* species are reported from there, *C. mertensiana, C. stelleriana, C. tetragona* and the North American form of *C. lycopodioides*. If they could be found, perhaps some questions could be answered.

Approaching from the southwest there is a good gravel road up Hudson Bay Mountain to what is called the plateau prairie at timberline (5000 feet). At the end of the road there was what looked like a little alpen village of many small, steep-roofed chalets attractively sprinkled throughout the area, each privately constructed and owned, I am certain. The term "plateau

prairie" leaves a somewhat erroneous impression because there were little hills with stunted trees and shrubby vegetation such as Vacciniums, *Cassiope mertensiana, Phyllodoce empetriformis,* and *Empetrum nigrum,* and there were valleys with lush herbaceous plants common to wet little mountain meadows.

This was obviously a winter sports community although the structure for the ski lift was broken down in a sorrowful state of disrepair. No trail up the mountain was in evidence so we labored up the extremely steep rocky slope, bulldozed beneath what was once a ski lift. At the top the going was much easier even without a trail. It was an undulating alpine grassland, broken occasionally by small rocky outcrops or little streamlets or damp seepages in shallow ravines. The trend was steeply upward and upon reaching the top of one rise another lay beyond, until we finally reached the top of the ridge.

Our way up from the top of the ski lift to the ridge had not been a direct one as each hummock, or ravine, or outcrop to the left and right had to be explored — naturally. Although not in flower, the heather could be spotted at a considerable distance away and each colony proved to be *C. mertensiana* or *Phyllodoce empetriformis.* We began seeing tight mounds of *Silene acaulis,* large and small, a few plants with a late flower or two. The short-needled, congested little plants of *Empetrum nigrum* were of fine form, their black "crowberries" ripening. It was a marvelous place to find the difficult to cultivate *Saxifraga tolmiei,* growing abundantly. In a few damper spots was a very small *Pedicularis* species, purple, about two inches high, its companion attractive little clumps of a gentian species that as yet I have not been able to identify.

We had been fortunate with the weather that day as it was warm, breezy, and the only sunshine we had had all week. From the ridge we had a spectacular view of Smithers directly below, the entire Bulkley Valley and the inviting snow peaks of Mt. Cronin and others in the distance. To our left the ridge sloped evenly upward toward the glaciers on Hudson Bay Mountain, a climb which would not have been difficult if we had only had the time. Although we could not see the usual dark green patches of heather, we could well imagine the treasures that might be discovered along the way.

There was one more hill to be explored close at hand and several small basins. While I took off to the hill, my husband found in one of the damp basins a lovely form of *Cassiope mertensiana* and a few extremely short-needled, very compact plants of *C. stelleriana* but nothing that appeared to be a hybrid between.

The north slope of the hill was covered with heather, mainly *C. mertensiana,* but toward the center was a single colony of *C. tetragona* covering perhaps a four by six foot area. Once you see the two side by side you can easily distinguish one from the other. *C. tetragona* has a distinct groove along the back of the leaf, typical of the Himalayan species, and the leaves are so tightly packed along the stems that they give a stubby appearance. *C. mertensiana* has a keeled leaf, more evenly and loosely imbricated.

One thing impressed me as being extremely curious. The two species did not mingle. It was as though an invisible fence had been built around *C. tetragona;* at the fence the two grew side by side, but one did not

invade the other's territory. Often it is difficult to find individual Cassiope plants small enough to dig, but this area was a collector's dream where there were small plants that could be lifted easily with complete root systems uninjured. Each seedling had its distinctive leaf structure with no evidence of gradations between. Beyond the lower edge of the *C. mertensiana* grew a small colony of *C. stelleriana.* I managed a sampling of each and hopefully they will establish and eventually flower in the garden. The *C. tetragona* from Hudson Bay Mountain is quite different in habit and foliage color from one from interior Alaska that barely exists in the garden, and from *C. saximontana* from Washington which grows very slowly and has not flowered.

The Himalayan and Japanese species have long been propagated in Great Britain and those in my garden are many generations from the original collections. My western North American species are first generation babies. I am finding them so variable in the wild that I wait to propagate as their special qualities become evident. When they finally establish their flowering pattern, it is interesting to note that they bloom at approximately the same time in April as those from the high Himalayas, the Japanese Alps, and as do the named hybrids from Great Britain. With our western North American species, where three or four come together in the wild, do they flower at the same time? Do they hybridize? Are they capable of hybridizing? Questions!—Questions . . . !

Quite apart from Cassiopes, we were then to make a delightful discovery. In the distance was what looked like a large blue oval platter which, of course, needed investigating. It was a Campanula, the color, flower shape and size of *C. rotundifolia.* The scape, however, was just long enough for the nodding bell to touch the foliage which formed a small, prostrate ¾″ cluster of slightly toothed leaves. The foliage was hardly discernible because each cluster was the size of the flower and produced one flower each. It didn't occur to me until a week later that it might be *C. lasiocarpa,* a species I thought grew in Alaska from Juneau northeast along the Bering arc, and southward as far as Japan.

In turning back we were immensely impressed by the rugged, white-capped mountainous terrain extending as far as we could see to the west . . . truly untouched, unspoiled wilderness. We took a different route down still looking for but never finding the elusive *Cassiope lycopodioides.* I looked back many times up toward the glaciered peak of Hudson Bay Mountain wondering if it might be growing at a higher elevation, perhaps in the company of *C. tetragona.* If only we had more time! Many entire vacations could be spent in this magnificent country of lakes, rivers and mountains; a photographer's paradise and a plant hunter's dream.

*The Yellowhead Highway now extends southeast from Prince George to Jasper in the Canadian National Parks where we spent the second week of our vacation. In Jasper I found a booklet on the wild flowers of Banff, Jasper, Kootenay and Yoho National Park, in which a single reference was made to *Campanula lasiocarpa,* the alpine harebell. I had with me an indispensable new volume by C. Leo Hitchcock and Arthur Cronquist. *Flora of the Pacific Northwest* in which I discovered that *C. lasiocarpa* can also be found in the Cascades of northern Washington.

OMNIUM-GATHERUM

SEED EXCHANGE HIGHLIGHTS—It is not necessary to make comparisons with previous years' Seed Lists. Suffice to say that the 1973-'74 Seed List, the first under the Directorship of Dr. Earl E. Ewert, of Dedham, Mass., shows 323 donors and 3566 seed lots. That these figures are not higher is explained by Mrs. Ewert, Secretary of the Seed Exchange, who writes that many regular donors did not send in seed this year because of a poor harvest due mostly to adverse weather conditions. For the same reason, she pointed out, many of the lots contributed were of smaller quantity than usual and that this made the filling of orders difficult and called for considerable adroitness in order to give fair distribution. Many thanks to the Director and his staff.

WHY SEND WEED SEEDS TO THE SEED EXCHANGE?—One of the so-called "weed seeds" mentioned in the article by Ronald Bowen was *Hypericum perforatum*. I hope that the donor who sent in this seed used the wrong name and that the seed sent was really something else. Knowing this plant as he does, had the Editor been the Seed Exchange Director and received this particular packet he immediately and forthrightly would have burned packet and contents and at no cost allowed them to be distributed. Beware of them, you who may have ordered them and now have them in your possession. They are deadly, not only in your own garden but in your community, your own countryside, even to the farthest state. Here are the distributional comments quoted from Abrams' *Illustrated Flora of the Pacific States:* "In fields and waste ground, a very noxious weed, difficult to exterminate, poisonous to horses. Naturalized from Europe. British Columbia to central California, and eastward to the Atlantic Coast." And this is what is said of it in *Vascular Plants of the Pacific Northwest* by Hitchcock et al: "A European weed, now a most serious pest on waste land and pastures throughout much of U.S., but especially common from c. Calif. to near Tacoma, Wash., less abundant n. to B. C. It is difficult to eradicate, and reputedly poisonous to livestock." The Editor knew well the prairie lands about Tacoma many years ago before the invasion of St. John's-wort and they were delightful areas. Then *Hypericum perforatum* invaded the prairies in force and the prairies changed. Now to walk these prairies during July and August one has to swish his way through myriad one or two foot high yellow-flowered weeds, unattractive even then. Later, in the fall, the dried but persistent stalks remain standing and make walking even worse. Being as tall as they are they have no place in the rock garden even were the flowers and foliage to be tolerated. It is a plant without one redeeming feature. Shun it! Eradicate it on sight—if you can!

It is hoped that all members interested in seeds—and that should comprise our entire membership—will have read the article entitled "The Seed Explosion" by George Schenk in the January issue of the *Bulletin* and the short article in this issue that you are now reading entitled "Responsible Rock Gardening" by Ronald Bowen, who lives in Minnesota. Both are concerned with seeds and the Seed Exchange.

CURRENT NEW MEMBERSHIP LIST—You will note that the new members as listed in this issue's *Bulletin Board* is longer than usual; actually 148 in number. In arriving at this figure family memberships are counted only as one though two people are involved. A breakdown of the new list reveals several most interesting mini statistics. Of the 148, 113 were from the United States (25 states involved) and 35 from other countries, 12 in number. Now, two new countries are represented by ARGS members; Spain is one, the new member being Mr. Charles Hook with a most intriguing address: Apartado 111 (Olsen), Los Llanos de Aridane, Isla de la Palma, Canarias, Spain, and the other is far off Sikkim in the eastern Himalayas. In the United States, one state really outdid itself. From a total membership of 7, Arkansas jumped to 17, more than double! Since most of the new ones live in Mena, Ark., where Mrs. Lillian Leddy lives, it is obvious that she has been very active. Mrs. Leddy moved several years ago to Mena from Omaha, Neb. It should be noted that in the previous quarter, it was Minnesota that led the rate of increase—from 18 to 32—almost doubling. Previously, neither Arkansas nor Minnesota had been considered as really active rock gardening states.

The new member from Sikkim, and the only one, is Mr. Kashab Pradhan, a name which brings back many happy memories to many Northwestern Chapter members. Kashab, his charming wife and small son lived in Seattle for a while a few years ago and attended several ARGS affairs. They came to meetings, went on a field trip to the Olympic Mountains, and showed colored slides of their homeland at the annual picnic. Both husband and wife were fluent in English and were delightful company. He was involved with forestry here and is now reputed to be in the forestry service of his country.

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