

Alpine Garden Club of B.C.





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Meetings are held the second Wednesday of each month except July & August, in the Floral Hall, VanDusen Botanical Garden. Doors and Library open at 7:00pm and Meetings start at 7:30pm sharp with the educational talk. Don't forget to bring a prize for the raffle which goes a long way to paying for the hall rental.

Cover: *Papaver lapponicum* drawn by Nico Verbeek

AGC PROGRAM

March 8th 2006 *Araucariana – Plants of the Chilean Andes.*

Philip MacDougall has recently returned from a hunt for rosulate violets in Chile and will share his experiences.

April 8th/9th Spring Show (Date to be confirmed)

April 12th 2006 Dave Demers, Seed Collecting in Mongolia

May 6th 2006 Spring Sale at St. David's Church, W. Vancouver

May 10th 2006 Tour of the [UBC Alpine Garden](#)

June 14th 2006 Sue Milliken and Kelly Dodson from Far Reaches Farm will give us one of their very amusing talks – probably on “Where the heck is Nagaland?”



Seed Exchange:

Seed was posted to Canadian and overseas members on January tenth and to US members on January 23rd, due to US phytosanitary requirements. Despite our best effort, it is not possible to meet all requests due to short supply of some items. This seemed particularly true this year; possibly not a good year for production of seeds. Hopefully everyone got more than 80% of what they requested.

Some donated seed does not get included on the list due to small quantity, late arrival or various other reasons (like our missing it on the list). Such seed is often put to good use at meetings, being sent to botanical gardens etc. We appreciate all the seed donations, which make our exchange possible. We would point out that we do not anticipate any restrictions on sending seeds to Canada from the US or overseas.

Good luck with germination and growing of your seeds. We wish you all the best in 2006 and remember our seed exchange when you have the opportunity to collect seed in your gardens or, particularly, in the wild.

~ Ian & Phyllis

ELIZABETH C. MILLER BOTANICAL GARDEN

Talk by Richie Steffen, Coordinator of Horticulture ~ by Ian Gillam

In common with a number of American botanical gardens, the Elisabeth C. Miller Botanical Garden had its beginning as a private garden. The Millers bought the five-acre site near Seattle in 1948 and Mrs. Miller developed about three acres of gardens over almost half a century, collecting a great many desirable plants. Her will left the property to become a botanical garden, not adding to the happiness of the neighbours in this exclusive, gated community. As a compromise the garden is open to small parties of visitors and limited to 500 visitors a year by appointment only. Reservations for the year are quickly filled when booking opens on February 1st.

The garden reaches a wider community through its publishing recommendations for planting in the distinctive climate of the Pacific Northwest. Richie Steffen, Co-ordinator of Horticulture, is a plant enthusiast whose great interest is in trying to grow plants new to the area in the hope of adding some to the Garden's picks. Richie spoke to Club members at our January meeting. He has many connections in the plant world, in part from his previous position as propagator at the Rhododendron Species Foundation, also near Seattle. The Miller Garden acquires plants from many sources, other gardens, private and public, nurseries and seed and plant collectors in many countries.

Rhododendrons, which grow so well in the region, were a major part of the garden and Richie has continued to add new species as well as other members of the *Ericaceae*. He showed slides of a species of *Menziesia*, RSF 294sd1998, with long tubular flowers in white and of *Vaccinium reticulatum*, also from the Rhododendron Species Foundation. This latter bears large "blueberries" that are bright yellow and also has reddish new growth. Surprisingly it comes from Hawaii, around the summits of the highest mountains where snow is a regular occurrence. So far it has only been grown with winter protection and its hardiness is unknown.

A current interest is in *Epimedium*. Forms available have increased greatly in recent years due both to collections in China and to selection of seedlings in cultivation. The Garden includes over 100 accessions, some with large flowers in a range of shades from white to deep pink and some with new growth coloured in coppery purples. One plant of an order of three added to the collection differed from its companions in having rather long leaves splashed with purple. It is so far unidentified and may represent a new species.

Some terrestrial orchids have proven successful outdoors. *Epipactis gigantea* 'Serpentine Night' has deep purple leaves and stems and flowers shaded orange. It is showy and grows and flowers readily. Of the *Calanthe* species tried *Cc. deflexa* and *discolor* are the best growers. They require rather heavy shade. Some cypripediums grow well in the garden. *C. henryi*, with rather small flowers of greenish yellow, in-



Greenhouse and Nursery at the Elizabeth C. Miller Garden

creases readily as does *C. formosanum*. The largest-flowered species, *C. kentuckiense* also grows and multiplies well.

Ferns are another interest. *Woodwardia unigemmata* has bronzed foliage that can grow to four to five feet. A real giant is the Chilean *Lophosoria quadripinnata*, almost a tree fern though not expected to grow a trunk in this climate. Its large fronds can reach 10 to 12 feet tall (though they haven't yet done so in the garden). Smaller rock ferns are native to well-drained crevices in areas experiencing prolonged dry periods and so are tricky to grow on the coast. A number of species of *Cheilanthes* have been acquired for trial outdoors along with *Pellaea atropurpurea* and *Ceterach officinarum*. It is a little early to conclude how successful they may be.

Mrs. Miller did grow alpine plants but in a garden largely based on a woodland garden and shrubs few have survived. A recent project has been the installation of an "Alpine Staircase", a rock stairway up a slope enriched with gravel and offering both a sunny and a shadier side. It is here that the rock ferns are planted together with the nucleus of a new collection of rock garden plants. Among the small shrubs shown were *Lonicera crassifolia*, an evergreen carpet with neat, rounded leaves of coppery colour, *Cassiope* 'Askival Snowbird' producing masses of white bells, and *Vaccinium* 'John's Blue' with reddish new growth that matures to a bluish colour. This last seems to produce neither flowers nor fruit.

Richie closed his presentation with slides of some seedlings he has raised from Japanese seed of hepaticas as well a few of the selected named forms. These range from expensive to very expensive but do produce astonishing flowers in colours from deep purple through reds and pinks to white and even yellow as well as exhibiting various degrees of doubling and colour variation within each flower. It is easy to see why they are so sought after but who does pay those prices?

With its very restricted public access the Elisabeth C. Miller Garden might be suspected of presenting sinecure positions for a fortunate few. From what we saw and heard Mrs. Miller's bequest is in good hands and her garden continues to expand the bounds of what can be grown in this region, to the benefit of gardeners and the nursery trade. We can look forward to hearing more of these treasures in the future.

(Pictures from this talk on page 15)



ORCHIDS FROM SEED

Talk by Mark Demers ~reported by Ian Gillam

Orchids are highly successful plants that grow over much of the land surface of the earth, from the sub-arctic to tropical treetops and towards the limits of the southern continents. The great diversity of their flowers, from minute to large and showy, often with peculiar adaptations for fertilization, makes them fascinating subjects for growers and naturalists. The discovery that the spectacular-flowered tropical epiphytic orchids could be cultivated in greenhouses in northerly latitudes led to an orchid mania in the 19th and early 20th centuries. Enormous numbers of plants were collected from the wild for shipment to Europe and North America. Unprincipled commercial collection damaged many populations, often beyond recovery.

Part of the problem lay in the slow growth of the plants. Propagation by division of cultivated plants simply could not satisfy demand and early attempts at growing from seed were unsuccessful. In nature, orchids generally seem to occupy rather restricted sites of suitable character, often scattered across wide areas. The family's solution to the problem of multiplication is to produce enormous numbers of seeds of very small size, easily scattered widely by wind. Orchid seeds represent the ultimate in miniaturization, containing little more than an embryo in a winged envelope. Devoid of the reserve of food usual in other seeds, these are unable to grow away without the assistance of an external food supply. Investigation led to the discovery that orchid seeds only succeed when they become infected by a suitable fungus that supplies essential nutrients, at least until the plant reaches the stage of producing photosynthetic leaves.

The earliest successful artificial growth of tropical orchid seeds was obtained by sowing them around the base of the parent plant, where suitable fungi occurred, though this was not recognized at the time. After a period small green seedlings appeared. This rather inefficient method led to the beginning of production of artificial hybrids. A 20th century innovation sowed the seeds onto an artificial medium containing sugar, minerals and other nutrients. Such media readily support the growth of numerous moulds and bacteria, so the medium must be prepared and kept under sterile conditions and the seeds must be free of

contamination. Development of suitable media has been largely by methods that stress definition and reproducibility yet modern media typically add undefined natural supplements such as coconut milk or fruit juices to achieve optimal growth. These methods are now standard in culture of tropical epiphytic orchids and have moved them from the greenhouses of wealthy industrialists to make them widely available at modest cost.

Hardy terrestrial orchids are equally interesting to gardeners and naturalists. Their populations, too, have been damaged by commercial collection. Progress in propagation from seed has followed a similar path. Some have had success in sowing the seed outdoors, either in suitable natural areas (see the Bulletin, **47#2**, 18-19, April 2004) or in prepared beds containing undefined natural fungi. Difficulties here lie in keeping the seedbed undisturbed yet free of weeds over the several years needed for plants to reach transplantable size.

Growth on defined artificial media has been developed for some species. Hardy orchids grow slowly, often with pauses for dormancy, and transfer of the small seedlings from flasks to outdoor conditions can be difficult. *Cypripedium* species and hybrids raised in this way are available from a few enthusiasts in several countries.

An alternative approach has been explored particularly in Britain. There the Hardy Orchid Society offers both seeds and cultures of suitable symbiotic fungi. Originally isolated from mature orchid plants, suitable fungal strains must not grow so vigorously as to overwhelm the developing seedlings in the culture medium. Approaches using nutrient media rely on laboratory techniques and equipment available only with some difficulty to determined experimenters but can be attempted in a kitchen or basement. Growers must expect to experience losses from contamination.



A simpler system more suited to the amateur grower has been developed recently in Japan. Information appears to be available to date only in the Japanese language and has been passed on to Mark Demers by Jason Nehring. At a recent AGC meeting Mark showed the encouraging early results of his experiments with this method. Importantly it elimi-



nates the requirements for sterile medium and aseptic technique. The substrate for growth is cellulose infected by fungi that provide the germinating seeds with nutrients.

The recommended form of cellulose is rather thick corrugated cardboard available as a scratching block for the use of cats kept indoors. This is a softer and more absorbent grade, grey in colour and lacking the heavier card exterior of cardboard boxes. Thinner sheets of similar cardboard used to wrap fragile items for shipping would doubtless suffice.

The nutrient solution and fungal inoculum is simply "compost tea", that is the liquid leaching out of a bag of garden compost left soaking in water overnight or longer. (It may be desirable to use water that has either been boiled and cooled or left to stand overnight to reduce the chlorine content.)

Cardboard is saturated with the solution and then stood upright in a further supply of "tea" in a translucent plastic storage container capable of being closed fairly tightly. The seeds are sown over the substrate reasonably thinly and the lid closed on the container. Mark left his incubator under the bench in his alpine house (out of direct sunlight) over the winter and through the following summer. By the end of summer the cardboard supported numerous tiny green plants, of *Bletilla* in the example he showed. It was that simple, and apparently even the first attempt was successful. The seedlings will remain in the container over winter, ideally with protection against freezing. They will require pricking out in spring. Presumably the cardboard can be cut into pieces and laid or pegged down onto a more conventional potting mix.

This procedure seems to offer an exciting new way of growing orchids from seed, well suited to the skills and techniques of most growers. Should it prove to work more generally, it opens up possibilities for making orchid plants available to many more gardeners or for return to native habitats. Raising large numbers from seed may also allow selection of superior horticultural forms. Let's have a variety of orchid seeds for the next seedlist to widen the range of these fascinating plants available to us.



VIOLA THEN & NOW

~ Ian Gillam

Donation of a surprising quantity of seed to the Seed Exchange from cultivated plants prompted interest in *Viola delphinantha* as did Pam Frost's recollection of seeing plants in flower in Greece. Further evidence that it does flower in cultivation can be seen in Jim Almond's photograph below.



Photo: Jim Almond, Shrewsbury, UK, cf. *Alpines for the Enthusiast* on his website www.freespace.virgin.net/almond.jim/index.htm

"*Viola delphinantha* seems very difficult to grow, and not much fun when grown, as it does not flower readily, nor give notable pleasure when it does. It has all the look of a rather miserable Delphinium as it arises on Athos or Olympus, with especially narrow leaves and erect stems." (Farrer, *English Rock Garden*)

“...looks little like a Viola, having grey-green narrow leaves upon wiry stems, bearing small long-spurred rosy-lilac flowers looking rather like a poor Phlox.” (*Mansfield, Alpines in Colour and Cultivation*)

“..A difficult but delightful plant, spasmodically in cultivation....”
(*Griffith, Collins Guide to Alpines*)

But, not to worry as “*V.delphinantha* seed was received in December and quickly rotted on encountering moisture indicating that it was dead. It is likely that dry storage is not tolerated.”

and in general remarks on *Viola*: “.... the seed is usually collected before it is mature and such seed largely rots. This is one reason why germinations were generally poor.” (*Deno, Seed Germination; Theory and Practice*)

In the forty to over eighty years since the quoted comments appeared, the climate expected for the Greek mountains has in effect moved northward and both the skills and resources available to growers have improved. Clearly *V. deiphinantha* can be cultivated successfully, if perhaps still with difficulty.

***Viola delphinantha* ~ Jim Almond, from his Plant Portraits on his website: [Alpines for the Enthusiast, UK](#)**

Once considered unobtainable and very difficult to grow, the former comment has been laid to rest and the latter only partly true. Cropping up on the Czech seed collectors lists with increasing regularity, everyone should have a go at growing this gem. A limestone crevice dweller from Greece, it is initially, obliging and quick to flower, the challenge is keeping a plant for longer periods! I habitually give *Viola* seed "GA treatment" as I know this guarantees good germination. However with fresh seed, I have had reports from others who have had good germination yields. Plants are grown in a mix of J1 No 2 loam based compost, coarse grit and perlite. From a central tuft, arise masses of wiry stems with linear leaves, these are adorned with rose lilac flowers, 2cm across for much of April and May. I have yet to try this in the open garden but see no reason why it would not succeed in a well drained spot. Plants in pots require regular repotting and during the winter when the stems die back, careful attention is needed to remove these otherwise botrytis quickly moves in. If you have a plant, cuttings are easily struck during early summer but they need to be grown on well to survive the die back period and subsequent winter. It's a treasure, Wilhelm Schacht once declared: "the finest alpine I have ever seen" - I would be hard pushed to disagree!

ERYTHRONIUM QUINAULTENSE AND ERYTHRONIUM ELEGANS, TWO VERY UNUSUAL SPECIES

~ by Art Guppy, Duncan, Vancouver Island, BC

Two recently named *Erythronium*, *E. quinaultense* and *E. elegans*, could well be described as western North America's most unusual *Erythronium*, and the latter species could well be the most enigmatic. As I have been observing and reading about the two species almost since they were named, and in 2005 I collected seed of both in the wild and donated it to the seed exchange, it seemed I should pass along some of what I have learned about the plants, so that those who plant the seed will know what to expect from them. They may be in for surprises.



E. quinaultense was named in 2001 by Geraldine Allen of the University of Victoria. It is a tetraploid species ($2n=48$) which evidently originated in the fairly distant past from the hybridizing of *E. montanum* and *E. revolutum* accompanied by doubling of the chromosomes, and it has traits intermediate between those of the two parent species. The flowers are close to white but the tepals are pink along the edges and at the tips. The leaves could be described as plain green except for a trace of mottling which is most apparent as pale lines along the veins. The species is found in a fairly large forested area north of Lake Quinault on the southwestern edge of the Olympic Mountains, Washington. The plants I saw when I was collecting seed were in fairly open old-growth

coniferous forest in habitat that varied from fairly moist near a stream to moderately dry on higher, sloping ground.

I have been able to observe the plants in my garden for several years, as Geraldine Allen very kindly gave me seeds in 1998. They are robust garden plants, but I am a little unsure of the flower colour in cultivation. I moved my garden from Metchosin to Duncan in 2004. In my old garden

the *E. quinaultense* flowers were almost white with rather inconspicuous pink markings on the tepal edges and tips. Because at Duncan I needed to build raised beds to get my plants above a soggy clay soil, it was March, 2005 before the *E. quinaultense* bulbs were planted. They flowered very well in spite of the late move, but the flowers surprised me by being fully pink. That unexpected (and delightful) colour change may have been caused by their getting more sun in their new location, but I suspect it was the response of the plants to the stress of being moved in March. I am waiting with interest to see the colour of these chameleon flowers next spring.

E. elegans is the problem species. It was named and described by Paul Hammond and Kenton Chambers in 1985. Its habitat is mainly on the summit area (about three square miles) of Mt. Hebo (945m/3100ft) in northwest Oregon, but there are also small populations on two mountains 15 and 25 miles to the south of Mt. Hebo. On Mt. Hebo it is found in open grassland, in brushy areas, and in coniferous forest, all of which seem fairly well-drained. It was described by Hammond and Chambers as having flowers ranging in colour from pure white to deep rose-pink, with the majority pinkish white, and as having leaves varying from plain green to heavily mottled. The stamen filaments were described as varying from being very slender to being moderately wide at the base. The plants with rose-pink flowers and heavily mottled leaves were described as being very rare in the population. The authors suggested that the pink colouration in the flowers and the mottling of the leaves may have come from introgression from *E. revolutum* at some time in the fairly distant past, but they did not believe the species was of hybrid origin. They believed that *E. elegans* was related to *E. montanum*, but that it differed from that species in having leaves that tapered gradually to short petioles, whereas *E. montanum* has leaves that taper abruptly to very long petioles, and that it differs in having flowers that are pendent, whereas *E. montanum* has flowers in a horizontal position.

It is evident that Hammond and Chambers had not seen the *E. montanum* on San Juan Ridge on Vancouver Island, as in that location the *E. montanum* commonly have the characteristics which they thought distinguished *E. elegans*. The characteristics which are usual for *E. montanum* in subalpine meadows seem to be simply an adaptation to the need to hold the leaves and flowers above the mass of competing vegetation usually present in the meadow habitat. On San Juan Ridge the *Erythronium* are generally under tall *Vaccinium* shrubs where there is little vegetation near ground level, so they tend to have leaves that taper gradually to short petioles, and the flowers are generally nodding, at least when they first open. On Mt. Hebo the *Erythronium* are in open habitat or under shrubs or in the forest, and consequently they have little competition from low vegetation, and they behave like the *E. montanum* on San Juan Ridge. There is a very instructive photograph of *E. montanum* on page 113 of *Bulbs* by Roger Phillips and Martyn Rix. The photo was taken on Mt. Rainier, so the plants probably are genetically



Erythronium montanum, San Juan Ridge
 Photo: Friends of Ecological Reserves
www.ecoreserves.bc.ca/

the same as the thousands in the mountain meadows, but they have the characteristics of the *Erythronium* on San Juan Ridge and Mt. Hebo. The reason is obvious: the Mt. Rainier plants in the photo are in scree-like conditions where there is no competing vegetation.

At the time the paper naming *E. elegans* was published, I had been growing *Erythronium* in my garden and observing various species in the wild for a number of years, and I was beginning to know the genus rather well. When I read the description of *E. elegans*, I immediately saw that if one thought of plants at one end of the range of variation described for the species, their traits would

be those of the *E. montanum* on San Juan Ridge, and consequently I formed an hypothesis that the population on Mt. Hebo was really a hybrid swarm of *E. montanum* and *E. revolutum*. The difficulty with my hypothesis was that at that time there was no evidence *E. montanum* could cross with *E. revolutum*. Indeed, E. I. Applegate, in his 1935 monograph on the *Erythronium* of western North America, had placed the two species in separate sections, which made it seem very unlikely the two could hybridize. Fortunately I had both *E. revolutum* and some San Juan Ridge *E. montanum* in my garden, so I proceeded to cross them, using two robust *E. revolutum* as seed parents. From their seeds I raised over 50 hybrids, which made a marvelous display in my garden, for they were very vigorous plants, and eventually most of them had 2 or 3 flowers. The offspring of one of the seed parents ranged in flower colour from very pale pink to deep rose-pink, while the offspring of the other parent were all various shades of pale pink. They all had narrow stamen filaments, though they were wider than those of *E. montanum*, and all had plain green leaves. They seemed very nicely to support my hypothesis of the Mt. Hebo population being a hybrid swarm, but I soon



Erythronium quinaultense
 Photos: Dr. Gillian Allen, University of Victoria, BC, Canada



Erythronium elegans
 Photo: Ian Young, Aberdeen, Scotland (Scottish Rock Garden Society
 cf. *Rock Garden*, Spring 2006 www.srgc.org.uk)



Photos: [Elizabeth Miller Garden](#), Washington, USA
 Slides from a presentation by Assistant Curator, Richie Steffan cf.pp.4-6



had to revise the idea, for I belatedly learned of an important new discovery on Mt. Hebo.

Shortly after the paper naming *E. elegans* was published, two researchers made chromosome counts from a small number of the Mt. Hebo plants. The counts were tetraploid, and were the first tetraploid counts for western North American *Erythronium*. Some years later, Geraldine Allen, in her paper naming *E. quinaultense*, reported that in connection with her research on that species, she had made a chromosome count from an *E. elegans* plant that confirmed the tetraploid counts made by the earlier researchers. She suggested that in all probability the Mt. Hebo tetraploids originated in the same way as had *E. quinaultense*; that is by the hybridizing of two species, probably *E. revolutum* and *E. montanum*, accompanied by doubling of the chromosomes. It is to be noticed that her hypothesis departed from the opinions expressed in the paper by Hammond and Chambers in that it meant that the Mt. Hebo species was of hybrid origin, and it indicated that *E. montanum* probably had been present on the mountain. If it was present in the past, it would not be surprising if it were present today.

Years ago I raised two *E. elegans* from seed from Mt. Hebo. One had a pure white flower, except for the touch of yellow at the centre; and its leaves were plain green. The other was identical except it had a faint tint of pink in its tepals. Both had slender stamen filaments. As I also had some *E. montanum* from San Juan Ridge, I soon noticed that there was no significant difference between the two taxa, except for that slight tint of pink in the flower of one of the *E. elegans*. I had revised my hypothesis to include a large number of tetraploids in the population and to include Geraldine Allen's suggestion that those tetraploids originated from the hybridization of *E. montanum* and *E. revolutum*, but I continued to believe the population must include the remnants of a hybrid swarm. Logically, after all, those tetraploids would have emerged in a hybrid swarm. With taxonomic matters, I follow what I call the "duck principle". If it looks like a duck, walks like a duck, swims like a duck, and quacks like a duck, it is a duck. Consequently, I felt sure the white-flowered plant I had raised from Mt. Hebo seed must really be an *E. montanum*, and its companion plant with the faint tint of pink in the tepals must be the product of several generations of hybridizing from a cross with *E. revolutum*, with backcrossing to *E. montanum*. An article by Brian Mathew in the September, 1998 *Quarterly Bulletin of the Alpine Garden Society* added to my feeling of conviction. In the article Brian Mathew mentioned that with the *E. elegans* plants he had grown, the foliage was plain green and the flowers pure white. To me that description suggested that his plants were probably really *E. montanum*, and also that *E. montanum* may be rather common on Mt. Hebo.

My curiosity was aroused, and in May, 2005 I visited Mt. Hebo to see for myself. Unfortunately, my timing was bad, as spring had come early in that region, and most of the *Erythronium* bloom was finished. However, my main reason for coming to the mountain was not finished. In



Photo: Ian Young, Scottish Rock Garden Society, Bulblog #18 www.srgc.org.uk/bulblog/

The *Erythronium revolutum* on the left comes into flower just as many of the other *revolutums* are going over, it has a shorter stem, the flowers have narrow dark petals, its style and filaments are pink/purple tinged and the petals also reflex in a more acute way than some of the other *revolutums* that we grow. From my records I believe that this type mainly comes from the northern range of its distribution, mostly Canada and especially British Columbia. The form on the left is a true gem with good pink flowers over some of the best marked leaves of all *Erythroniums*. We grew this from seed that came from 'God's Valley' and most of its seedlings come true to the plants illustrated. ~ Ian Young

the shade of forest trees there were still white-flowered *Erythronium* at the peak of bloom. I inspected those plants very carefully. The flowers were pure white except for the touch of yellow at the center; the stamen filaments were slender, though possibly a tiny fraction of a millimetre wider than those of *E. montanum*, and the leaves were plain green. To me those white-flowered plants are *E. montanum*, and they are evidently fairly common on the mountain.

The *E. montanum* of Mt. Hebo differ from the *E. montanum* of San Juan Ridge in two ways: the stamen filaments seem very slightly wider, and the plants are easier to grow in a garden. Both differences are explained by the *E. montanum* of Mt. Hebo and nearby mountains very probably having been isolated from other populations of the species for thousands of years as glaciers melted and the climate warmed. The cool, moist winds off the Pacific would have made it possible for them to survive and adapt to the changed conditions. The difference of stamen width is too slight to be significant, and could easily be the result of random variation over a long period of time. The fact that they are better adapted to garden conditions than the same species on San Juan

Ridge is explained by the difference of latitude. A lower latitude has much the same effect on plants as a lower altitude.

The apparent existence of numerous *E. montanum* in the Mt. Hebo population reinforces my belief that the remnants of a hybrid swarm could still be there, but on my visit in May I was too late to look for any plants close to *E. revolutum*. However, the paper naming *E. elegans* provides very strong evidence that *E. revolutum* has been present at least until very recently, for it mentions that “some local colonies consist largely of mottled plants”. A single colony with mottled leaves could be explained as being the result of a second hybridization event producing a different group of tetraploids, but it seems virtually impossible that there could be several colonies of tetraploids with the same conspicuous difference from the main group of tetraploids. Surely the most probable explanation for those colonies of plants with mottled leaves is that *E. revolutum* plants, or plants very close to being pure *E. revolutum*, formed the nuclei of the colonies with mottled leaves, and those colonies would be the diploid remnants of a hybrid swarm. Hammond and Chambers were unaware that tetraploids made up a large part of the population when they wrote that the “majority of individuals have a pinkish-white perianth”, but it seems likely they were describing what were later found to be tetraploids. Actually no one has written a detailed description of the tetraploids, but we can piece together a description that is likely to be accurate. In the key to related species in the paper naming *E. quinaultense*, the tepals of *E. elegans* are described as more or less “white to pinkish, the outer ones generally more strongly colored, especially on the outer surface”. The Spring, 1992 ARGS *Bulletin* on page 123 has an excellent photo of an *E. elegans* taken on Mt. Hebo. The flower has the inner tepals white or almost white, and the outer tepals are a pale pink on the inner surface and a darker pink on the outer surface. That photo perfectly fits the description given in the key mentioned above. The photo shows leaves that are almost plain green but have pale lines along the veins. Probably we now have an accurate description of the tetraploids on Mt. Hebo, and it seems clear the colonies with mottled leaves are a different taxon, almost certainly the remnants of a diploid hybrid swarm.

Not only do we now have a description of the tetraploids, but I believe we have a description of the entire *Erythronium* population on Mt. Hebo, and there is a reasonable hope it is right. It is made up of a large number of tetraploids with inner tepals that are almost white, and contrasting outer tepals that are pale pink on the inner side and darker pink on the back. These plants have leaves that are almost plain green, but have pale lines along the veins. The second largest group in the population consists of *E. montanum* that are well-adapted for growing in a garden. The third group, probably quite small and scattered, is made up of the remnants of a diploid hybrid swarm, with possibly an occasional *E. revolutum*. That description of the population is an hypothesis, and it is to be

hoped that before long someone will do a proper study of the population so we can know if it is correct.

In future years there are certain to be many questions raised about this enigmatic population. At present the entire population is called *E. elegans*, but that seems very unlikely to be acceptable for very long. If I had them in my garden, I would label any that look like the photo in the Spring, 1992 ARGS *Bulletin* as *E. elegans*, and the ones with white flowers and plain green leaves, I would label as *E. montanum*. The others I would label with question marks.

Judging from the floras that have been published for the

Pacific Northwest during the past half-century, there are likely to be taxonomists writing in floras for this region in the future who will make changes to the two species in the title of this article. In the past we found in *Vascular Plants of the Pacific Northwest*, Part 1 (1969) by C .L. Hitchcock, *et al* that the former species *E. idahoense* had been lumped with *E. grandiflorum* as var. *candidum*, and the former species *E. nudopetalum* had been lumped with *E. grandiflorum* as var. *nudipetalum*. (Notice the change of spelling.) Geraldine Allen, writing in two recent floras, has lumped *E. howellii* as merely an unnamed form of *E. citrinum*. If that trend toward lumping continues into the future, *E. elegans* and *E. quinaultense* are likely to be lumped as one species because they are almost identical except for the arrangement of pink in the flowers. It would be anybody's guess which name would survive. It could be *E. elegans* because that name was given first, or it could be *E. quinaultense* because it is ambiguous what plants were given the name *E. elegans*. I suppose I am somewhat of a splitter, as I am undecided whether the changing of *E. idahoense* and *E. nudopetalum* to varieties of *E. grandiflorum* was justified, and I feel strongly that *E. howellii* should continue to be recognized as a species. I want more time to study the population on Mt. Hebo before I form an opinion on *E. elegans* and *E. quinaultense*, but I lean toward keeping them as separate species.



Erythronium howellii
www.elib.cs.berkeley.edu





COLLECTING SEEDS ~ by Linda Verbeek

Once you get started seriously growing plants from seed, you soon end up collecting seed yourself. And then you find out that that is quite an odyssey in itself. There are basically two completely different stories to seed collecting: what you do in your own garden, and what you do in the wild.

Collecting seed in your own garden has two advantages. The first is that you can be (reasonably) sure of what you've got. Of course, once in a while a plant comes into the garden with the wrong name. If you are very lucky, you know it is the wrong name, but you also know the right name. Most often you know it is the wrong name, but you can't figure out what the right one is. Especially if you have no idea of its origin, it can be pretty well impossible to key a plant. Once in a while you might not recognize that a plant has the wrong name, if you are quite unfamiliar with both the correctly-named plant, and the wrongly-named one you have in front of you. You may find out later that the plant is wrongly-named, by accident, or you may never find out, and then the error gets perpetuated through the seed exchange(s).

The other advantage is that you can check the plants regularly, and get the seed just when it is ripe. Well, theoretically. There are a whole lot of plants for which this is true, plants that have their seeds in capsules, or berries, that don't immediately explode when ripe. Genera like *Primula*, *Papaver*, most of the bulbs, and so on. With these plants, even if you are a day or two late, you only lose a little, because they shed their seeds gradually, and some is usually left in the bottom of the capsule. On the other hand, you have to go around every day, or at least every other day, to get the seed released that day. For some, and that includes most of the bulbous plants, you can pick the whole capsule once it has split open, and wait till the seed sheds itself (upside down in a paper bag works well). In a few cases, especially *Alliums*, the seeds will ripen if you do that, but not fall out of the capsules, and you have to tease them out individually later on. *Alliums* will do this in the wild, too, and we have collected the capsules like that in the wild - they only hold 6 seeds at the best of times, so it involves a lot of teasing. Berries are easy to collect, and usually don't fall off all that quickly. You only have problems if the birds are interested.

Some plants that make capsules only make very tiny ones - too tiny to shake the seeds out of *in situ*, so you have to pick a lot of them. These are often small plants too, and I find myself kneeling in the wet grass day after day to collect the seed of *Gypsophila cerastoides* and *Silene alpestris*, for instance. *Silene acaulis* and *Saxifraga oppositifolia* are just as bad, but I grow them in a trough, which makes them easier to get at.

However, by no means all plants present their seeds in tidy capsules. Some, like the *Menthaceae* and the *Boraginaceae* (and the grasses, for

that matter), have single-seeded fruits that come loose from the plant as soon as ripe, and then may lie in the enclosing calyx for a while, but usually fall out immediately. These are very hard to collect - sometimes I put a piece of paper or plastic under the plant, but then you have to worry about the whole thing getting wet. I found that *Salvia forskahlei* makes enough seed so that you can shake it out on a piece of paper once a day and get enough. *Mertensia* (at least *M. sibirica*, which is the only one I can grow) is not so prolific, and some years I succeed in getting the seed, and other years I don't. This is where you run into one of the disadvantages of garden seed: usually there aren't all that many plants, so that you can't collect all you need in one go, you have to patiently accumulate it over time.

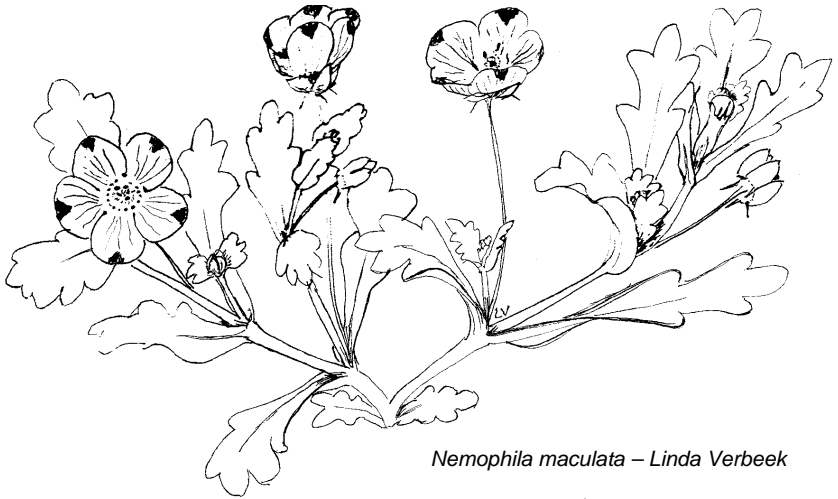


Oenothera: Ripe seedpods
Oblong-shaped buds, formed on upper parts of main stems and branches, open in sequence up the stem to produce the 4- petalled yellow flowers; these open in the evening, each lasting only 1 or 2 days.

The other disadvantage of garden seed is that you don't always know what the seed should look like, and therefore, whether what you find in fruit is truly viable seed. If you find a plant with seed in the wild, it is a pretty fair bet that they will be viable, but in the garden you cannot be so sure. Even when I have grown a plant from seed myself, I don't usually remember what the seed looked like, and especially if you have only one plant, you have to be suspicious, as many wild plants need cross-pollination. Even if you have more than one, the pollinators may not be there. Sometimes the plants will set seed, but it will not be as good as when cross-pollination does occur. This is the case, for instance, with *Oenothera acaulis*. For years I had just one or two plants, and never got more than a few seedlings. But a few years ago I started cross-pollinating by hand (tricky, because the flowers last only one night, and the stigma doesn't

unfold till midnight or thereabouts; I usually force it a little), and since then I have had seedlings galore. If I am not sure about the quality of the seed, I may try to germinate a batch myself, before burdening the Seed Exchange with it - if it isn't any good, you don't want to spread the disappointment around.

Even worse than the *Menthaceae*, etc. are the plants that actively distribute their seeds. *Viola* is one example - you can go around 3 times a day and find a particular capsule still green, or maybe just turning brown, and then the next time you come by it is open and empty! Ap-



Nemophila maculata – Linda Verbeek

parently they throw out their seeds. The same is true of the Geraniaceae. I've found that these are easiest to pick late in the season (if they still make seed, then, of course) - it seems that the throwing mechanism doesn't work so well in the dewy late summer and fall mornings, and if you come early enough, you can find the *Viola* capsules open but still full of seed, and the *Erodium* seeds still hanging on to the fruiting stems. The *Viola* capsules manfully try to shoot their seeds later - every once in a while you hear the pop as they do it in the seed bag.

Alstroemeria and *Oxalis* cannot be stopped by damp weather - they just erupt, no matter what. For *Alstroemeria*, I go by the criterion that if the capsule snaps off when I try to bend it on its stalk, it is ripe (in my experience, it would explode within half a day if I left it), and then I accumulate them in a bowl with a piece of heavy paper or something over it (otherwise they'll jump out when the capsule snaps). They take a lot longer to explode if you do this, but eventually they do, and the seeds look just like the ones you can occasionally find lying on the soil, and which **are** fertile, because I find the seedlings in the spring. Lately, I have also put bags of very porous material, like old pantyhose or cheesecloth, over the whole umbel of ripening fruits. This works very well, and the seeds are obviously ripe, but you still have to collect them fairly frequently, because the bags get damp, and I don't know whether that damages the seeds. *Oxalis* has very complicated fruits, which open with slits on the side. The brown seeds are enclosed in a white cover, and I think it is the white cover that provides the shooting force. If you can see little glimpses of brown in the whitish fruits, or if those will show if you squeeze the fruits ever so gently, you can collect the seed - but beware, because they will start erupting in your hand, as they come out of the fruit with their white covers on.

I have also collected seeds off the soil - this spring I hadn't realized that the *Corydalis paczoskyi* was shedding seed until they were nearly

all gone - but fortunately the plant was in a pot, and the seeds are very black and shiny, so I managed to retrieve a good many of them from on and between the patio stones, with the aid of a fine forceps. I've done the same with *Nemophila maculata*, (illustration on facing page) the fruits of which are underneath the plants, and split open right to the bottom. They are small fruits to start with, and hold only 3 or 4 large seeds, so sometimes it is easier to just pick the seeds off the sand.

The other side of the story is collecting in the wild. The first problem there is to know what you are looking at - few plants have flowers and ripe seeds at the same time. So it helps if you are familiar with a particular area, but there is always a chance for mistakes. And most people (unless seed-collecting is a major avocation) don't have the time to go to a place several times, so they can see the plants in flower and collect the seeds later.

And advantage here is that you usually run into enough plants of a particular species to collect all the seed you want in one go - sometimes it is hard to know when to stop! If you don't find more than a few plants, you should not collect it at all - they need a chance to reproduce in the wild, too.

The other problem with collecting in the wild is that you usually get only one shot at it, so there are always going to be plants that don't have seed - either because it isn't ripe yet, or because it has all been shed already; very frustrating. I remember going to the Bighorn Mountains once, and finding a good stand of *Aquilegia jonesii* - all in green fruit! Not a single flower, nor a single seed to be had. I still haven't seen it blooming in the wild.

And of course, wild plants show exactly the same range of behaviour as garden plants. Some are easy - if you find a *Penstemon* that is just shedding its seed, you can go around with a seed envelope, and shake into it what you want without even a need for cleaning any of it later on. But most require more effort. We found *Phlox diffusa* in full seed one year. *Phlox* in seed are very pretty: the calyx goes hard and straw-coloured and opens into a flat star when the seed is ripe. The tiny capsule (also straw-coloured, and smaller than a rice grain) sits in the centre of this star, and if they have flowered well, the little cushions are just covered with these stars. But the capsules must only stay there for a very little while - usually you find the plants with the stars and nothing in the centres. Even when we found the plants with all their capsules, it was hard work, sitting on your knees and picking out the capsules one by one. In this case, it was a nice sheltered slope in the sun, so even though it was September at high altitude, it was quite comfortable, just hard on the knees.

Another time we collected *Lupinus lepidus* var. *lobbii*. Lupines, as most *Fabaceae* do, shed their seed by twisting the two halves of the pod, and I have almost never found legume seeds in open pods. In this case, the fat little seeds were lying all around the plants among the sandy gravel they were growing in, and that is where we gathered them.

Which would have been OK, except that it was right at the top of the mountain, and a young gale was howling over the ridge. The only way to keep from freezing was to stay way down in the lee of some rocks. I think we probably gave up before we had all we wanted, that time.

Another thing to watch out for is that some plants look like they have made a major seed crop, but most of it is fluff, not actual seed at all. *Eriogonums* are notorious for this - the actual seed is a small triangular nut-like achene at the bottom of the papery structure, and often there are only a few good ones in a whole seedhead. So it pays to check as you collect, and if it looks like there are only a few, just collect a lot more seedheads.

The worst offender in that respect that we ever encountered was a species of *Abronia*, which we found on a beach in Washington State. I think we collected half a paper bag full of the bulky fruits, and then spent a couple of evenings by the campfire splitting these open with our fingers. The total yield may have been somewhere around 50 or 60 seeds - I am almost inclined never to try again.

And then, once you have the seed, wherever you gathered it, you have to clean it. As I said, sometimes you are lucky and it comes out of the seedpods clean, right into your seed envelope. But that is rather the exception - usually there is debris. Whether you collected heads of daisy seeds and now have bracts thrown in with them, or whole capsules of something that now need to be emptied out and discarded, or berries that need to be opened, cleaning seed is another major operation. I have no hard and fast rules for it. Sometimes you can sieve the seed with two or three different mesh sieves, sometimes (actually fairly often) the seed is relatively heavy, and if you put it in a slightly bent piece of paper and blow gently, the debris may separate. Sometimes the seed is very round, and rolls easily, and then you can tap the paper and make the seed roll out of the junk you don't want. Sometimes you almost have to pick the seeds out individually with tweezers or something - and sometimes it is just impossible. It is important, however, not to give up too soon - it makes it very much more difficult for the people packaging seeds in the Exchange when the seed is not clean.

Berries are another problem - they are meant to be eaten, usually by birds, and in the process the flesh of the fruit is digested away, so the seed emerges cleaned. Generally it is a good idea to take the seeds out of the berries - if there is more than one seed per berry you almost have to - but it can be a messy procedure. Some berries split open easily when they are dry, releasing the seeds, but others will adhere to the seeds even more tenaciously when they are dry, and there is no predicting which is which. Nowadays we often squeeze the contents of the fresh berries onto a piece of paper towel. The seeds will usually stick to the paper enough so they don't blow off at the slightest breeze, and you can peel them off with a fingernail when they are dry. Although some people recommend soaking the berries till you can rub the flesh away from the seed, I've never found that an easy thing to do.

So, now you have all your seed nicely cleaned and sorted, a job well done. But before you know it you can start over again, with the plants that shed seed after the winter, rather than as soon as ripe. And so the years turn.



Letter to the Editor

Dear Editor:

Having nothing cheerful left to do during those dark January days of rain, I was sorting through old plant labels (read: mortuary tags). Could I re-use some on pots of division or cuttings? Erase the pencilled cryptics [AGCBC P.D.12/G.).30/T.S.15/D.D.4] and put the usual [?? bulb ??]? Place on the 'Try Again' list, or put in the trash?

A very disturbing thought occurred to me that I have probably killed more plants than I have alive today, and what has survived has not been 'alpines'. Have I finally learned to avoid tiny silvered tufts that need to over-winter under three feet of snow? Not really, but they tend to be larger silver tufts more suited to a shrubbery than a trough. Have I learned that living 30ft above sea level (rather less this particular week) in a rainforest with maybe six foot-candles of light from October to May, to stop the killing of small plants which need perfect drainage? The air is so humid it runs down both sides of the windows. These considerations bring me to my questions for you to put to the membership:

1. Can I keep airborne humidity from adversely affecting little scree-lovers?
2. Is this why there are so few entries in pot shows? Do members not enter the pot shows because of a lack of light?

But surely, if I qualify to judge a pot show, does this not mean that we have lowered our standards sufficiently to allow the floppier plants to be welcomed? Surely it isn't a lack of lovely clean pots and appropriate top dressing.

I eagerly await answers from our members.

Thank you so much, Ruth Anderson, Eagle Harbour, West Vancouver, BC



SOUTH AFRICAN PLANTS FOR NORTHWEST GARDENS *~ Summary of a presentation by Jim Fox*

On a very wet November day Jim Fox drove up from Seattle to speak to Club members about a trip he made to South Africa to see some familiar garden plants growing in the wild and to discover some less familiar ones that may also be suited to our climate. As well as being manager of the well-known Wells Medina nursery, Jim is a dedicated plant enthusiast. Collecting in South Africa is controlled (for sound reasons) and Jim's trip was purely for his own experience. However, seeds of many of the plants he saw are available from South African sources. While the emphasis was on plants for our coastal climate, readers in more continental climates should bear in mind that the Denver Botanical Garden has had considerable success in growing and distributing a number of plants from high altitudes in South Africa. These have proven hardy with some snow cover. Jim stressed that many South African plants in cultivation arrived a century ago or even longer. They were usually collected from coastal areas that were then readily accessible. The same species obtained from greater altitude are likely to show increased hardiness, a good reason for attempting to grow them from fresh sources.

The tour group consisted of eight members with the valuable inclusion of a South African botanist familiar with the area. They travelled in a small bus with a professional driver apparently accustomed to calls of "Stop" when interesting plants were glimpsed at the roadside. In fact, roadsides were prime sites for wildflowers, often with disturbed soil and protected from grazing animals by barbed wire fences. The tour consisted of a circuit around the independent kingdom of Lesotho, centred on the highest parts of the Drakensberg mountains, with visits to those higher areas accessible by road. It took place over two weeks from late January to the first few days of February (equivalent to late July to early August in our hemisphere), a period of good blooming. In the mountains the weather was sometimes cold and wet. At lower elevations it was hot

VIRAGS

The [Vancouver Island Rock and Alpine Garden](#) Society's Annual Spring Flower Show will be held at the Cadboro Bay United Church Hall, 2625 Arbutus Road, Victoria, on Friday, April 21st from 1 PM to 9 PM, and on Saturday, April 22nd from 9 AM to 4 PM. Commercial Growers will be in attendance and the Society's Annual Plant Sale will start on Saturday at 11 AM. Refreshments will be available. Non-Member Exhibitors are welcome
Tel: 250-519-0269. Admission is by donation.



Kniphofia caulescens

and sunny.

Southern Africa experienced no glaciation and the landscape has undergone erosion only by wind and water. The Drakensberg presents spectacular ramparts of reddish rock rising almost vertically. Around these heights are steep but rounded hills covered in grasses and other herbs. Trees only seemed to occur in more sheltered ravines. It was illuminating to see the habitats favoured by various plants that we grow in our gardens. A strange one was *Zantedeschia albomaculata*, an arum "lily" well-known to grow in damp, even wet places. Here we saw it growing as a crevice plant in a crack in a steeply sloping rock down which water trickled. (This preference for a wet yet constantly draining site is

typical of many of our own alpine plants, at least at blooming time as the snow is melting.) Another popular garden plant that grows in such places is *Schizostylis coccinea* (now *Hesperantha coccinea*) that was found on steep rocks constantly moistened by spray from a nearby waterfall. *Phygelius* also grew in similar situations. *Agapanthus*, too, occur in damp areas but in this case not quite so wet or rocky, rather in slight hollows on sloping meadows.

Long cultivated in milder climates are some of the many kniphophias that have hybridized considerably in cultivation. One of the most spectacular views was of massed spikes of the red and yellow "poker" flowers of *K. caulescens* seen against a wide expanse of lower mountains. This species forms large plants, eventually developing the stout, procumbent trunk from which it takes its name. Plants are remarkably stable in appearance both across the colonies and between them. Not so for other smaller species. *K. laxiflora*, with slender spikes of flowers, is highly variable in colour, yellow, green and shades of reddish orange or salmon, often in the same locality. Seed of this species is likely to produce a range of colours. *K. thodei*, another high altitude species, is slightly less variable in shades of reddish orange fading to white as the flowers mature. The shading varies from colony to colony. *K. ritualis*, also from high altitudes, has broader, fleshier leaves. Its orange red buds fade to pale yellow as they open. These poker flowers grow mostly in grassland, often damp, though some grow also on rockier areas.

Several species of gladiolus were found. *G. papilio* is grown here in a form with rather drooping flowers of a strange mix of smoky shades, greys, browns and greenish. It is completely hardy here and tends to spread by underground means. A form with brighter flowers, white with

reddish markings, was found on this trip and is likely to be equally hardy. Perhaps the most spectacular gladiolus was glimpsed way below on a steep and rocky cliff. One of the group did inch his way down to it at some risk. It proved to be *G. saundersii*. This is a small plant with large and showy red flowers. From the altitude at which it is found it is likely to be hardy here. Plants were not plentiful and seed collection would be difficult.

The plants seen present a number of puzzles. As noted, some are highly stable in appearance wherever they were found and others vary, often quite widely, even within the same colony. *Cotyledon orbiculata*, long cultivated in Europe, is a succulent

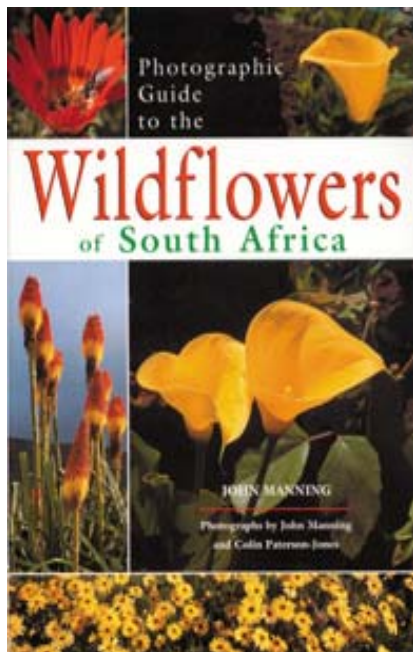
with thick greyish leaves usually paddle shaped. It bears spikes of hanging salmon bells and grows up to about 3000m in the Drakensberg. (In my experience it is not hardy here without protection.) One slide showed a small group of flowering plants growing in a patch of more level rock fragments on a steep hillside. One had the expected paddle-like leaves, one had much narrower leaves held almost vertically and one was intermediate. Yet it is likely all were from seeds from one individual.

The essential field handbooks for the area are the two by Elsa Pooley. These were constantly referred to and it became usual to hear "Let's see what Elsa says" about identification of any newly seen plant. It was thus a pleasant surprise to find that the lady searching the roadside on a day later in the tour was indeed Elsa Pooley, naturally enough out in the field during the peak blooming season. Her books will be of interest even if you are not contemplating a visit to this spectacular treasure house of nature.

Jim Fox recommended three books by Elsa Pooley. These are; *Trees of Natal, Zululand & Transkei*; *Mountain Flowers: A Field Guide to the Flora of the Drakensberg and Lesotho*; *A Field Guide to Wildflowers of Kwazulu-Natal & the Eastern Region*. Also *A Photographic Guide to the Wildflowers of South Africa* by John Manning.

A source for obtaining books is (website of the National Botanical Institute). www.nbi.ac.za

Silverhill Seeds (www.silverhillseeds.co.za) offers a wide variety of seeds, largely wild-collected.



The Alpine Garden Club of B.C. brings together people interested in alpine, native and other hardy plants both in cultivation and in the wild here and abroad. Monthly meetings are held at VanDusen Garden on the second Wednesday of the month and feature a speaker, show of pot-grown plants and discussions. Garden visits, field trips and hikes are planned during the spring and summer. Members participate in the seed exchange, spring show and displays at various events. Our Bulletin distributed to members is also available on our website www.agc-bc.ca.

Student memberships at a reduced rate of \$10 per year are available to those studying horticulture, ecology and related topics at recognized colleges and universities. The Club offers an introduction to a wide range of interesting plants, many of which are not commonly found in commerce.