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COVER: *Aquilegia scopulorum* with vespid wasp
by Cindy Nelson-Nold of Lakewood, Colorado

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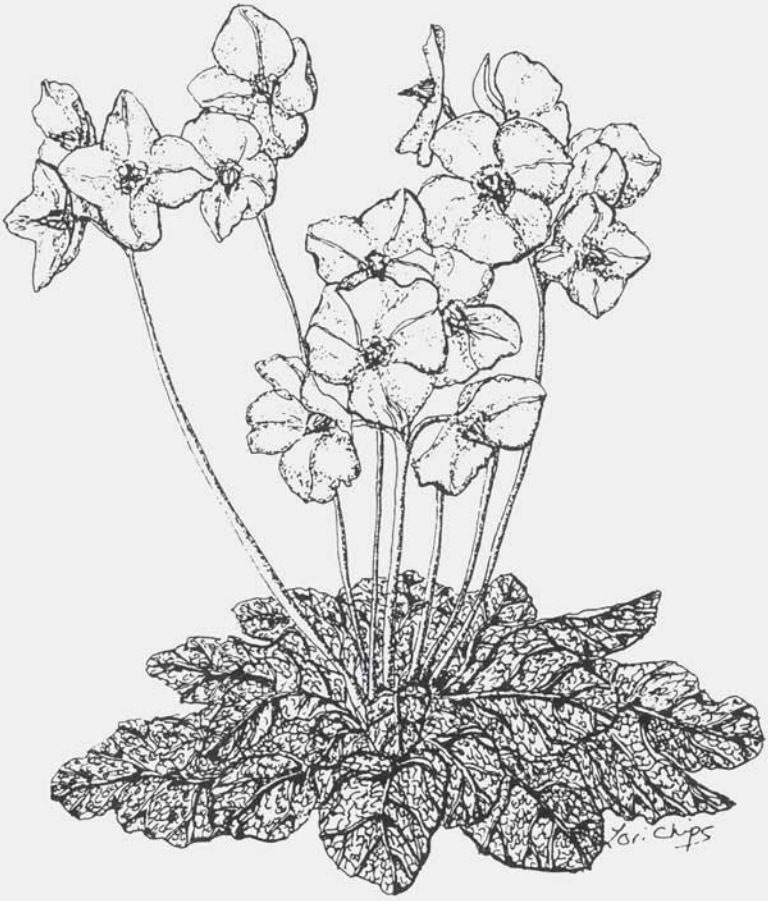
FEATURES

DEPARTMENTS



Ramonda nathaliae

Alpine Gesneriads

of Europe

by Darrell Trout

The Gesneriaceae, or gesneriad family, is a diverse family of mostly tropical and subtropical plants with distribution throughout the world, including the north and south temperate and tropical zones. The 125 genera, 2850-plus species include terrestrial and epiphytic herbs, shrubs, vines and, rarely, small trees. Botanically, and in appearance, it is not always easy to separate the family Gesneriaceae from the closely related Scrophulariaceae (*Verbascum, Digitalis, Calceolaria*), the Orobanchaceae, and Bignoniaceae (*Incarvillaea, Campsis*).

When thinking of gesneriads most people think of tropical and rain forest plants but there are a number of meaningful exceptions to that generalization. From Chile come the temperate gesneriads *Asteranthera, Mitraria*, and *Sarmienta*, which have been grown successfully outdoors in the Pacific Northwest and in the British Isles. The Japanese *Conandron* and *Opithandra* have been grown in USDA zones 2 and 3. The more recent introduction from China, *Hemiboea henryi*, has survived several Long Island winters. Recent botanizing in China by Dr. Laurence Skog of the Smithsonian Institution and others brings the total Gesneriaceae of China to a count of 56 genera and about 413 species. These should provide new horticultural material for the rock garden and alpine house. Yet the choicest plants for the rock garden or alpine house remain the European genera *Ramonda, Jancaea*, and *Haberlea*.

History

The family was named for Konrad von Gesner, a sixteenth century naturalist. Gesner influenced the development of a number of sciences. He made studies and published major works on plants and animals between 1551 and 1565. His love of mountains and alpine plants led to his authoring what is considered to be the first treatise on alpine plants, published in 1555. Gesner said, "I am resolved henceforth...so long as life is granted me by divine providence, every year to ascend several mountains or at least one when plants are in full growth, partly for knowledge of them, partly for noble exercise and gladdening of the mind. How great indeed are the enjoyment and the delights of the spirit as it's affected by contemplating in

wonder the vastness of the mountains and raising one's head as it were among the clouds." (One wonders how rhapsodic Gesner would have been had he actually seen the alpines in his namesake family.)

Considering the popularity of the most frequently cultivated genera (*Saintpaulia, Sinningia, Columnea* and *Streptocarpus*), it is surprising that the alpine, hardy, and half-hardy gesneriads are not better known and more widely cultivated.

The rock gardening community, particularly in Europe, knows and thinks highly of these rock garden plants. Reginald Farrer, writing in his 1907 classic *My Rock-Garden*, refers to the alpine gesneriads as "a group of rock-plants before whom we ought to go down in gratitude on our knees." Much earlier, in 1587, the recorded history of the family begins with Jacques Dalechamps, *Historia Generalis Plantarum*, which included one of the European alpines, *Ramonda myconi*, which was there called *Auricula ursi myconi*. Dalechamps noted that it was called *Auricula ursi* by Franciscus Myconus (or Myco'), but that it was unlike the other auriculas. It was cultivated in the Low Countries in 1604. In 1629 the noted British herbalist John Parkinson, in his *Paradisus Terrestris*, called it "Blew Bearews Eares with Borage Leaves" (still keeping it with the alpine primulas), and it is likely that he also knew it in the garden. It was grown by Philip Miller in his garden at Chelsea as early as 1731. Linnaeus, in 1753, classified it as *Verbascum myconi* in the eighth edition of *Miller's Gardeners' Dictionary*.

In 1780 the genus name *Ramonda* was applied in honor of Ramond de Carbonnieres, a French geologist and statesman. For his work in popularizing the concept of empire for Napoleon he was awarded the title of Baron. As a native of region of the Pyrenees, this natural scientist made the observation that in high mountains the vertical zones of vegetation might be equivalent to horizontal zones in a north-south relationship. Humboldt later developed this concept in detail.

Ramonda

The three species of *Ramonda* are similar in appearance, all forming low-growing rosettes of hairy, evergreen, crinkled, short-petioled leaves with scalloped or irregularly toothed margins. Clusters of from two to six flowers emerge from the leaf axils. The corolla is nearly regular with a very short tube and lobes that lay flat. The usual flower color is purple with a yellow center, although pink and white colors occur naturally in all three species. (In the early 1900s Farrer described named color selections, although none pleased him as much as the ordinary form.) The stamens are inserted at the base of the corolla on short filaments. The fruit is a linear capsule.

Ramonda myconi (frequently mislabelled *R. pyrenaica* or *R. myconii*; the first an accurate site-name (Pyrenees) that was applied later than the honorific; the second, a misapplication of naming rules) has broad, oval, hairy leaves 2-2.5" wide, irregularly toothed around the margin of dull green. The flat rosettes frequently measure about 8" across. It has a five-lobed corolla, one inch or more across. Flower stalks or scapes are about 6" long. It is known only from the Pyrenees, on both sides of the French-Spanish border, where it is abundant. The other two species are endemic to the Balkan peninsula.

Ramonda nathaliae, which was named for the Queen of Serbia (Her Highness Queen Natalija) was discov-

ered by Sava Petrovic on the cliffs at Jelasnica, and later on the top of Suva Planina. Sites have been confirmed in the north and south of Albania, with more likely to be found.

Ramonda serbica was discovered in 1847 by Josip Pancic on the mountain of Rtanj. It was also found in other sites, in what was then known as Serbia, including Jelasnica and Sicevo Gorge near Nis. Additional sites in Albania, Bulgaria, and Epiraean Greece have been noted. There are no sites where *R. nathaliae* and *R. serbica* occur together.

The similar appearance of these two Balkan Peninsula species has caused some botanists to conclude they were the same species. They both grow as low rosettes of dark-green leaves with similar colored flowers and live on calcareous cliffs in mountainous regions. Although most botanists point to the four-lobed corolla of *R. nathaliae* versus the five-lobed corolla of *R. serbica* and the bluish anthers rather than yellow, the Yugoslav botanist Kosanin stated, "The clearest morphological difference is apparent in the shape of the leaves. The quadripartite nature of the petals in *R. nathaliae* is variable, and while the insignificant differences in the length of filaments and anthers may be lost in dried plants, the leaf shape never varies." *Ramonda serbica* has a smoother leaf that is rhomboidal in shape, quite strongly toothed, upturned at the edge, and which narrows gradually to a wide, short stem. The leaf of *Ramonda nathaliae* has a more oval form, is not as deeply toothed, and rounds directly into a substantially longer petiole. *Ramonda serbica* has fewer and smaller flowers on longer scapes. *Ramonda serbica* has a chromosome number of n=36, *R. nathliae* and *R. myconi* have chromosome numbers of n=24.

This botanical discussion does no justice to the beauty of these plants—let Reginald Farrer do that when he described *R. nathaliae* as, "wonderfully free in the flower," and "the flowers are rather larger, earlier, and infinitely more bright and delicate," and, "a clump of *Ramondia* [sic] *Nataliae* [sic] in good bloom beats every other beautiful *Ramondia* [sic] quite into the background." Graham Stuart Thomas said, "To see those beautiful lilac flowers projecting from the furry green rosettes of *Ramonda myconii* [sic], set in a vertical crevice, is one of the great spring joys to me."

Haberlea

Haberlea rhodopensis was introduced into cultivation in 1881 from sites in the Rhodope Mountains in both north and south Bulgaria and northeast Greece. The plants form large masses, covering every nook and cranny on the shady limestone cliffs at altitudes between 400 and 700 meters. This species has the heart-stopping habit of shrivelling up in the summer heat, yet recovering when autumn mists and rain begin.

The leaves are tough (more leathery than *Ramonda*), slightly hairy and dark green with a serrated edge bearing a row of hairs projecting from the edge (described by some as a row of hairs on a toothbrush). Young plants grow as flat rosettes, while older plants have a tendency to produce tufts of the somewhat shiny leaves. Buds are formed at the base of the rosettes and are visible at the beginning of the growing season. The corolla is almost twice the length of the brownish-purple, hairy calyx. The lilac-to-purple corolla is not flat as in *Ramonda*, but trumpet-shaped and with a flaring limb, like the small sinningias, and has brown and gold spotting in the furry throat. The flower

clusters, generally five to a scape, are lax, rather than being upright. There is a white-flowered variety, *H. rhodopensis* var. *virginalis*, that is less showy and has generally only been available in Europe.

Haberlea ferdinandi-coburgii has only been located in central Bulgaria near Lovech. The 1902 description in *Flora Europaea* describes it as less glabrous (actually it's almost hairless) than *H. rhodopensis*. This smaller plant produces three to six larger flowers on a stem. The round-faced flowers are held horizontally or as F.E.B. Ferns says, "You should expect a plant whose flowers look one straight in the eye...not modestly downcast through half-shut lids of oval or foxglove-like appearance." The face of the flower is about 2" across with the top two lobes pale violet and the lower three white. The corolla tube is lavender with darker spots on both sides of the tube, the throat flecked with yellow and brown dots.

It should be noted that in *Haberlea*, as in other alpine genera, species can vary in small to more significant ways. Many more individual plants need to be grown to fully delineate the species and resolve the size and flower-color-pattern questions.

Jancaea heldrichii

The most poetic descriptions of any of the alpine gesneriads have been reserved for the monotypic genus *Jancaea*, which is fitting for a plant only found on Mount Olympus, the home of the gods, in northeastern Greece. This truly beautiful plant with silver-haired foliage has been said to have rosettes of spun green-silver. F.E.B. Ferns added that this fickle Grecian goddess had the unique quality of absolute beauty which prose has no power to describe and the poets have never seen. Will Ingwersen said that in certain lights the petals glitter as brightly as the crystallized violet flowers used as cake decorations.

It is described as forming widespread lawns, growing at altitudes from 200 meters to 2500 meters. At the higher elevation it is well above the Bosnian pine and the last of the beech. The greatest concentrations of these plants are found between 600 m and 1200 m elevation in habitats very similar to those of ramondas. *Jancaea heldreichii* is generally found in shadowy crevices in boulders or limestone cliff faces where a small amount of soil or humus has gathered. The sun rarely reaches these spots, only occasionally peeking through the branches of the forest beech and slanting over the rock faces for only brief illumination.

Jancaea heldreichii was discovered in 1851 by Th. von Heldreich, then director of the botanic gardens in Athens. In 1879, Boissier named the genus after the Hungarian Balkan explorer, Victor Janka. This species has also been known as *Ramonda* (*Ramondia*) *heldreichii*. The small, dense, silvery rosettes are formed of short-petioled, entire or elliptic leaves that are densely silver-haired above and rusty-woolly below. The leaf blades are about 1 3/16" long, 3/4" wide. A 2-3" hairy peduncle bears one to four slightly-nodding, lavender, campanulate flowers with four or five lobes. The light-colored inflorescense provides a nice contrast to the very dark anthers and pistils.

Hybrids

x *Jancaeamonda vandedemii* (also incorrectly called *Ramonda* x *Vandedemii*) apparently first resulted from the cross *Jancaea heldreichii* x *Ramonda myconi* by Henri van Dedem sometime between 1922 and 1924 at Chatelaine, near Geneva. In spite of

published comfirmations of individuals growing the plant in the 1950s in Switzerland and the 1970s in Great Britain there was no universal agreement that a hybrid was ever created. The authenticity of the original hybrid was finally confirmed by Josef Halda of Czechoslovakia, with his successful recreation of the cross.

Halda created additional hybrids in 1983-1984 using *J. heldreichii* and *R. myconi* as seed parents. Note that *Jancaea heldreichii* has a chromosome number of n=28, *Ramonda myconi* is n=24, and *Haberlea rhodopensis* is n=22. Halda crossed *J. heldreichii* with *H. rhodopensis*, which he named x *Jancaeberlea panayotii* , and *R. myconi* with *H. rhodopensis*, which he called x *Ramberlea kistlerae*. Both hybrids are described as intermediate between the parents.

Halda also had success crossing *Conandron ramondioides* from Japan, and *Didissandra lanuginosa* from China with the European genera. It should be underscored that these hybrids are quite remarkable as the genera are not only widely separated geographically in nature, but they also have very different chromosome numbers.

Cultural Information

Jancaea, *Ramonda*, and *Haberlea* can all be grown from seed, leaf cuttings, and division. The seed should be treated as any gesneriad seed, which is extremely fine (up to 2 million seeds per ounce), and should be surface sown. Fresh seed germinates quickly and easily without cold-stratification (although cold doesn't cause harm either). Use your regular alpine growing mix with a layer of milled sphagnum moss on top, which will prevent damping off. Sow seed of *Ramonda* and *Haberlea* thinly on moistened (not soggy) mix, and *Jancaea* on the same mix in crevices of tufa where the plants are to remain. All watering of seedlings must be from the bottom of the pots; water standing in the rosettes will be fatal.

Transplanting will probably not take place for six months to a year when seedlings reach the size of a dime; then it is one more year before they can be planted out in the garden. Remember to acclimate the seedlings slowly to garden conditions, particularly if started indoors, under lights. Also learn patience—it will take four or five years for your plants to reach flowering size from seed.

Under ideal conditions this time can be shortened. Maryjane Evans, Seed Fund Chair for the American Gloxinia and Gesneriad Society, reports that her plants of *Ramonda nathaliae* took less than three years to reach in-bud stage. The seed was sown on June 27, 1991, germinated July 31, 1991, and the plants were in bud on March 21, 1994. They were grown in her greenhouse, shaded by a bench throughout the year. Winter temperatures probably dipped slightly below 50°F at night, and summer temperatures were moderated by an evaporative cooler behind the ramondas. Seed was sown on and the plants were grown in a peat-based soilless mix. The plants were allowed to go quite dry and were watered only when near wilting.

Leaf cuttings are treated in much the same way as for related plants. Many of the Old World gesneriads will produce plants from a single cell and will consequently initiate growth from any cut leaf-vein. Lawrence Thomas, Chairman of the Manhattan Chapter of the North American Rock Garden Society, uses leaf sections of *Ramonda* for rooting. He gets his best results by taking leaves in the spring and placing sections upright in moist sand, the pot enclosed in a plastic bag

and kept in the shade. In three to four weeks the plants are rooted and growing. This approach results in good-sized plants in one-third the time as growing from seed. Using leaf-sections (about four or five per leaf) produces more new plants with less destruction of the mother plant than using the entire leaf to produce one new plant. Remember that each leaf of a *Ramonda* rosette will persist for five to six years so it is quite destructive to take any of the middle leaves for propagation.

The side rosettes of strong-growing plants can be removed, potted up, and kept in a protected environment (cold frame, prop-box, etc.) until well rooted. This works particularly well with *Haberlea,* which grows more as a cluster of leaves rather than as a symmetrical, flat rosette. In fact, haberleas should be divided every five years or so to prevent overcrowding (which reduces flowering). With *Ramonda* and *Jancaea* it is better to gently remove the offset with the main rosette remaining in place, as mature plants resent being moved.

Growing conditions

In North America, the Northwest and Northeast are the most favorable areas to grow these alpines, with the best microclimates providing enough cold to ensure dormancy and cool, moist summers to assure growth. They have been grown in USDA zones 2-7; in the East from Washington, D.C. north to Ontario, in Canada. The most critical factor for success is providing a dry medium during their season of slow growth or dormancy. During the dry season in nature, these rosette plants have leaves that lose their dark green color and simply roll up.

Ramondas and haberleas are not difficult to grow. In fact, at a recent seminar, Dr. Howard Pfeifer suggested that the only thing difficult about ramondas (all three species) was obtaining them. (This is not so for members of the American Gloxinia and Gesneriad Society, c/o Horticultural Society of New York, 128 West 58th Street, New York, NY 10019, who can purchase seed of most of the alpine gesneriads through the Seed Fund.)

It is best to provide a growing location in open shade where no water will drip on the plants from the leaves of overhead shrubs and trees. The ideal placement is on the northeast, north, or northwest side of a rock that shows at least 10" to 12" above ground and is set even deeper underground. These large rocks help to simulate the plants' natural habitat, to stabilize temperatures, and aid in moisture control. If provided the root run, ramondas can develop tap roots over 12" long. Many authors have suggested that a planting location on a slope is necessary, but there seems to be as much success by those growing them in well-prepared sites on flat ground. Soil should be prepared to a minimum depth of 12" or replaced with a fast draining, gritty soil. Soil preparation is particularly important for ramondas, which prefer being left undisturbed for many years—ramondas do get better as they get older.

Plants benefit from a stone mulch, several inches deep under the leaves, which helps to prevent the leaves from rotting as the rosettes push so tightly against the ground. The stone mulch also helps improve drainage and moderates temperature swings. After the ground freezes in winter, it is useful to cover the plants, particularly in areas that don't consistently have good snow cover, to prevent cycles of thawing and refreezing. Mother Nature provided for us this winter (1993/1994) an unusually thick blanket (over 53" deep of snow in New

York City), more than twice our usual total and four times last year's 13.1". When you can't count on that snow cover, use pine boughs or pine neddles (up to 6" deep). Bob Bartolomei, curator of the T.H. Everett Rock Garden at the New York Botanical Garden, prefers to use the new synthetic micro-blanket, with a sheet of white plastic over it to prevent it from becoming soggy. He does not use pine needles because the residue left after spring clean-up can encourage rot in the most sensitive plants.

Alpine gesneriads also can grow in crevices on the north side of a rock wall. One grower in southern New York State, Midge Riggs, had success planting ramondas into rock walls using a still-wet ("oozing") plaster of hypertufa in a crevice. The crevices were so small that gluing the plants in was the only way they would stay in the wall. ("Hypertufa" is a cement/peat moss/perlite mixture used to construct troughs and is porous after it hardens.)

Trough growing is viable for those lacking space to build a full-fledged rock garden or shady scree, or who have no garden at all. In New York City, ramondas and haberleas have been successfully grown in troughs on a Manhattan balcony, in a Queens backyard, and in Brooklyn on an unheated porch. Trough growers use soil mixes that vary from: 1 part peat moss, 1 part perlite, 1 part vermiculite, with 10% soil added, then adding up to 50% gravel or grit by volume; to, 1/3 soil: 1/3 peat: 1/3 grit, adding more grit if the mix doesn't drain to the grower's satisfaction. Adding a little dolomitic limestone and superphosphate is fine, although the lime doesn't seem necessary, even though the plants are found on limestone rocks in their native habitats.

Haberleas differ little from ramondas in their needs, liking deep, stony crevices. They will take slightly brighter conditions, or sun reflected by rocks, as long as it does not reach the soil around the roots. These conditions will promote maximum flowering.

Jancaea heldreichii is the prima donna of the group, requiring deft handling. Reginald Farrer describes the problem as the felty leaves covered with a fine white down. He goes on to say that, "The plant is utterly, absolutely opposed to any surface moisture whatever. It must be planted where no drop or drip can ever get to it." Farrer finally had success when his manager found a "cunning cavity which you have to bend down if you want to see (it), my best *Jankaea* [sic] was stuffed with plenty of rough peat, in such a cavern that no shower could ever worry it."

Jancaea heldreichii requires a very gritty soil mix with perfect drainage. It can be planted in a vertical crack less than 1/4" wide. Some of the best successes come from growing in blocks of porous rock or tufa either simply placed in a pan of water or set in pots in an alpine house. Josef Halda suggests a mix (for seedlings and mature plants) of 1 part leafmold from *Corylus* or *Fagus* (genera indigenous to Mt. Olympus) and 1 part very small limestone particles. He adds that using a rich soil with composted cow manure mixed with old beech leafmold can produce rosettes of more than 20 cm in diameter.

In Holland, Harry Jans had great success planting 25 one-year-old seedlings on the north side of a free-standing tufa wall, under projecting stone. The planting holes were partially filled with a mix of 10% peat, 15% fibrous loam, 15% chopped sphagnum moss and 60% tufa grit (0-3 mm.). The seedlings were set with an additional collar of sphagnum under the rosette.

Only one of the seedlings died, and many flowered in their third year in the wall. Note that during construction Mr. Jans installed a network of tubing in the wall to provide watering; he considers this system essential for success in this type of installation.

In the USA, *Jancaea* has generally been considered semihardy. I believe the real problem is keeping it dry enough in winter while dormant, rather than not surviving the cold. Using a glass or plastic "roof" (or the micro-blanket and white plastic sheet) over the plants during winter should help in many regions. In addition, there may be the real problem of selecting and collecting seed from the most cold-tolerant plants, presumably near the top of its 2500 m range. (Note that the collecting of plants from Mt. Olympus has been prohibited since 1938.)

These beautiful alpine gesneriads offer an interesting horticultural challenge with a grand reward for success. Growers of tropical gesneriads should try them in containers and troughs. Rock gardeners should add them to their rock walls and shady screes. These jewels deserve a place in your gardens! I agree with Graham Stuart Thomas when he said, "I do not feel that the planting of a rock garden is complete without some of these plants...".

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Drawing by Lori Chips

Darrell Trout has been gardening for over 20 years. He grows hundreds of gesneriads under lights and hybridizes *Streptocarpus*. He is co-editor of *Crosswords*, and contributing editor of *The Gloxinian*. He lives in Forest Hills, New York.

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Notes on Names

I know that many people share the frustration of name changes throughout all plant families—even to the extent of applying their own set of "synonyms" to the taxonomists involved. This seeming confusion ultimately benefits all of us who grow plants by allowing us to communicate effectively—if we follow the rules.

The rules are detailed in the *International Code of Botanical Nomenclature*, which guides botanists when they want to give a scientific name to a plant. The most difficult part of the rules to understand is the section on "orthography," which details how new names should be spelled. This is further complicated by names that were applied prior to the rules being set.

Generally, the original (earliest) spelling (or name itself) *that is validly published* must be used. When *Index Nominum Genericorum* was published in 1979, listing all the validly published plant names and their places and dates of publication, some problems of variant spellings became obvious.

In the case of *Jancaea* (or *Jankaea*) the name of the genus was first published by Boissier in 1875 as *Jancaea*. Later that same year, Boissier published a different spelling, *Jankaea*, based on the more often used alternate spelling of Victor Janka von Bulcs' name. The earlier spelling has rarely been used since then. Because of that, in 1982, Dr. Laurence Skog, of the Smithsonian Institution, proposed to the nomenclature committee that the later spelling (*Jankaea*) be continued or conserved. Unfortunately, the committee did not agree and by one vote short of the required two-thirds majority, the proposal failed. From now on *Jancaea* is the spelling that must be used.

What follows is a list of the valid plant names in this article with other frequently used invalid names:

Correct Name	Invalid Names
Jancaea heldreichii	*Jankaea heldreichii* *Ramondia heldreichii* *Ramonda heldreichii*
x *Jancaeamonda vandedemii*	x *Jankaea*monda *vandedemii* *Ramonda* x *Vandedemii*
x *Jancaeberlea panayotii*	x *Jankaeberlea panayotii*

Phyllodoce empetriformis (p. 20)

Phyllodoce x intermedia (p. 20)

photos, Arthur Dome

Phyllodoce glanduliflora (p. 20)

Cassiope stelleriana (p. 19) photos, Arthur Dome

Cassiope hypnoides in bud (pp. 17, 18)

Cassiope mertensiana ssp. *gracilis* (p. 19)

Cassiope mertensiana (p. 19)

Cassiope tetragona ssp. *saximontana* (p. 19)

Phyllodoce aleutica (p. 20)

photos, Arthur Dome

Phyllodoce aleutica (p. 20)

Phyllodoce aleutica (p. 20)

CASSIOPES & PHYLLODOCES

PSEUDO-HEATHERS OF NORTH AMERICA

by Arthur Dome

The plants generally referred to as heathers that grow in the northern latitudes and various alpine regions of the North American continent are not true heathers. Rather they are members either of the genus *Cassiope* or of the genus *Phyllodoce*. The true heather is *Calluna vulgaris*, native to Europe and in some ways similar in appearance to *Cassiope*. The leaves have a plaited or braided appearance in both genera. *Erica* species, also occasionally referred to as heather, are more properly called heaths, and they grow primarily in Europe, the Mediterranean region, and South Africa. They have needlelike leaves similar to those of *Phyllodoce*.

Most of these plants are native to arctic or alpine areas at treeline or above. I have grown all the species and varieties mentioned in this article with the sole exception of *Cassiope hypnoides*. They can be very interesting additions to the garden if you can give them the right environment and growing conditions. They do best in a light, lime-free, organic-type soil that is well drained yet never dries out. Where they thrive in the wild, there are always moist soils, so in the garden we should make sure that they have adequate moisture, especially during the growing season. These pseudo-heathers like life best out in the open, rather than in shade, but be sure to protect them from hot afternoon sun and soil that gets too warm. During periods of very warm weather, misting with a fog nozzle is beneficial.

These plants are considered to be very hardy and are capable of withstanding extreme cold as long as they are dormant. Without snow cover or some protection from continuous winter winds and drought conditions they stand a good chance of drying out. A sudden extreme drop in temperature in the autumn before they have gone dormant can be fatal. Prolonged warm spells with bright sunlight before winter is over can cause them to break dormancy, start to grow and produce flowers. If below-freezing temperatures set in again, or there are late frosts, the effect can be devastating. Plant them in the right conditions and keep them happy, because if they become stressed they can succumb to certain root diseases if such pathogens are present in the soil.

It is best to obtain these plants from specialty nurseries or other gardeners,

as the chance of having a plant collected in the wild survive is practically nil. Leave the plants alone for others to enjoy and just take a few cuttings or seeds when the time is right.

Sometimes when you plant very small plants in the open garden they may need protection from small animals that dig into the soil around them. One way to protect them is to place some flat rocks or shale around the plant. As the plant grows, move the rocks out. These flat rocks also help keep moisture in and weeds down.

If the soil medium in the container is drier than the soil of the garden, it is advisable to submerse the container and root ball in water until all bubbles are gone before planting. The top of the root ball should be placed such that it is even with the level of the garden soil after all has settled. It is still a good idea to water the plant and the soil around it after planting, even if the root ball has been saturated.

Plants that are really too small to place directly in the garden or those that arrive from the nursery in soil mix incompatible with that of the garden can present a problem. In such a case, it it often advisable to grow the plants on in pots, adjusting the soil mix to one more similar to that of the permanent planting site. Wait to plant them out until they have developed more size and a larger root mass.

Late summer is the best time to take cuttings if the wood is right. If the temperatures stay warm into the fall or early winter the cutting wood will not get hard enough to make a good cutting until then. Use whatever cutting medium works best for you; I prefer half peat and half coarse sand. Sometimes cuttings taken late benefit from use of a rooting hormone and bottom heat.

Other ericaceous plants, such as the dwarf or low-growing *Calluna, Erica, Gaultheria,* etc., make ideal companion plants. The right selection of the heaths and heathers, in some areas, can help provide color year around in that area of your garden. Space plants on 18-24" centers. Herbaceous, low-growing, ground cover type perennials can be planted between these woody shrublets to help suppress weeds and add color. These ground cover plants are cut back or removed as the shrubs grow.

In nature, cassiopes and phyllodoces start to bloom soon after the snow melts; in lowland gardens they begin even sooner. Blooming times mentioned in this article pertain to gardens in the Puget Sound region of Washington State.

Most of the *Cassiope* and *Phyllodoce* species grow along the Pacific side of North America from California north to the Aleutian Islands and inland to the Rocky Mountains in some cases.

The genus *Cassiope* consists of dwarf evergreen shrubs that form mats 1" high to those that grow 15" tall. The color of the foliage ranges from gray-green to rich green.

Cassiope hypnoides (syn. *Harrimanella hypnoides,* photo, p. 14) has a range from the Arctic south into New York and New Hampshire. It is a tiny, prostrate, moss-like plant with spreading, linear leaves, bearing white, campanulate flowers with red calyxes on red flower stems at the ends of the branchlets April to May. I have only seen this plant grown in a pot; it is considered difficult to grow.

Cassiope lycopodioides (photo, p. 22) is found in the Aleutian Islands, southeastern Alaska and British Columbia. It is a creeping evergreen shrub that may grow

from 1-3" high and can spread into mats 3' across. It has single, white, campanulate flowers borne in the axils of leaves. Leaves are usually grayish-green. It blooms from April through June. This is one of the more adaptable cassiopes in cultivation.

Cassiope lycopodioides ssp. *cristapilosa* is found in alpine and subalpine areas of the Queen Charlotte Islands off the west coast of British Columbia. It also has been found on Mt. Si in Washington State. It differs from the type plant in that it has one to several conspicuously curled, unicellular hairs up to 1/16" long at the tip of each leaf. It has a prostrate habit of growth and white flowers. This plant is a collector's item.

Cassiope mertensiana (photo, p. 15) grows from Alaska, the Yukon, and British Columbia south to California and Nevada, east to Idaho and Montana. It is 6-15" tall and has dark green foliage and white, lily-of-the-valley type flowers. Some pink forms have been found, as well as some with split corollas. It blooms April to May and can do well and bloom well if happy.

Cassiope mertensiana ssp. *gracilis*. This subspecies is found in some of the mountains of Northwestern America (photo, p. 15). It is not as tall as the type, and the stems or branchlets are more slender. The foliage is olive green. It is more floriferous than the type with larger, white, bell-shaped flowers and seems to be easier to grow; it does well in the home garden. It blooms April to May.

Cassiope mertensisa ssp. *ciliolata*. This subspecies is found in the Mt. Eddy region of northwestern California. It is a much slower grower and more compact than the type. The edges of the leaves are rimmed with fine hairs, and the white flowers are a little smaller than the type. It is a collector's item, also.

Cassiope mertensiana ssp. *californica*. This form is found mostly in the Sierra Nevada regions. It is said to be slightly superior, and it does well in cultivation. It seems to be a slower, more compact grower than the type and has white flowers April to May.

Cassiope stelleriana (syn. *Harrimanella stelleriana*, photo, p. 14) is found in Alaska, British Columbia, and Washington. It is a low-spreading shrub that very seldom gets over 3" high. Its leaves spread out at right angles to the stems rather than being appressed as in other *Cassiope* species. It has single, creamy white, sometimes pink-tinged flowers that appear at the tips of the branchlets, and blooms April to June depending on its location. This species seems to be on the delicate side and doesn't like to be disturbed. I've seen it very happy in a trough.

Cassiope tetragona is found in Alaska, Yukon, British Columbia, Washington and Montana. It grows 4-10" tall with dark green foliage and white flowers. It is very similar to *C. mertensiana* but can be easily identified by the deep furrow on the back of the leaves. It blooms April to July.

Cassiope tetragona ssp. *saximontana* (photo, p. 15) is mostly found in higher elevations of the mountains of British Columbia, Washington, and the Rockies. It does not grow as tall as the type, and it seems to be easier to obtain. Its white, bell-shaped flowers are smaller and do not extend above the tips of the branch-

lets, which are themselves a lighter green than in the type. It usually blooms in June.

The genus *Phyllodoce* also consists of dwarf evergreen shrubs with various species growing 4-10" tall. The foliage is usually dark green. Flowers within any species may vary as to size, shape, and color.

Phyllodoce aleutica (photos, p. 16) is found from the Aleutian Islands to western Alaska. It grows 4-10" high. Its globular to urn-shaped flowers vary from light yellow to greenish-yellow, borne April to May. It is a very interesting plant.

Phyllodoce breweri (photo, p. 21) is found in California on the San Bernardino and Sierra Nevada Mountains. It usually grows 4-12". It has flat, open-faced flowers that vary in color from pink to rosy-purple. It blooms May to June. The flowers are unique. In the wild it grows in places with plenty of moisture.

Phyllodoce caerulea (photo, p. 21) is found in the arctic regions south to Maine, New Hampshire, and west to Alberta. It grows 5-8" high. Its flowers range from oval to urn-shaped, and they range in color from light purple to dark purple. It blooms April to May. It can be a little touchy to grow.

Phyllodoce empetriformis (photo, p. 13) is found in Alaska, British Columbia, west to Alberta and south to Wyoming, Idaho and California, the greatest range of the North American species. It grows 6-18" tall. Flowers, May to June, range from oval to campanulate and from pale pink to dark rose. In the right environment, a good garden plant.

Phyllodoce glanduliflora (photo, p. 13) is found from Alaska and British Columbia, west to Alberta and south to Washington and Oregon. It can grow up to 14" tall. The flowers range from globular to urn-shaped and are a greenish-white to greenish-yellow. Occasionally a white-flowered form can be found. It blooms May to June. This is more of a collector's item.

Phyllodoce x *intermedia* (photo, p. 13, 22) is a natural hybrid (*P. empetriformis* x *P. glanduliflora*) and can be found in some areas where populations of these two species grow together. Different hybrids will grow to 6" or 12" The shapes of the flowers vary between those of its parents and range from pale pink to purple. Some of these hybrids have been named, such as 'Drummondii' and 'Fred Stoker'. They bloom May to June. Hybrids seem to be better garden plants than species.

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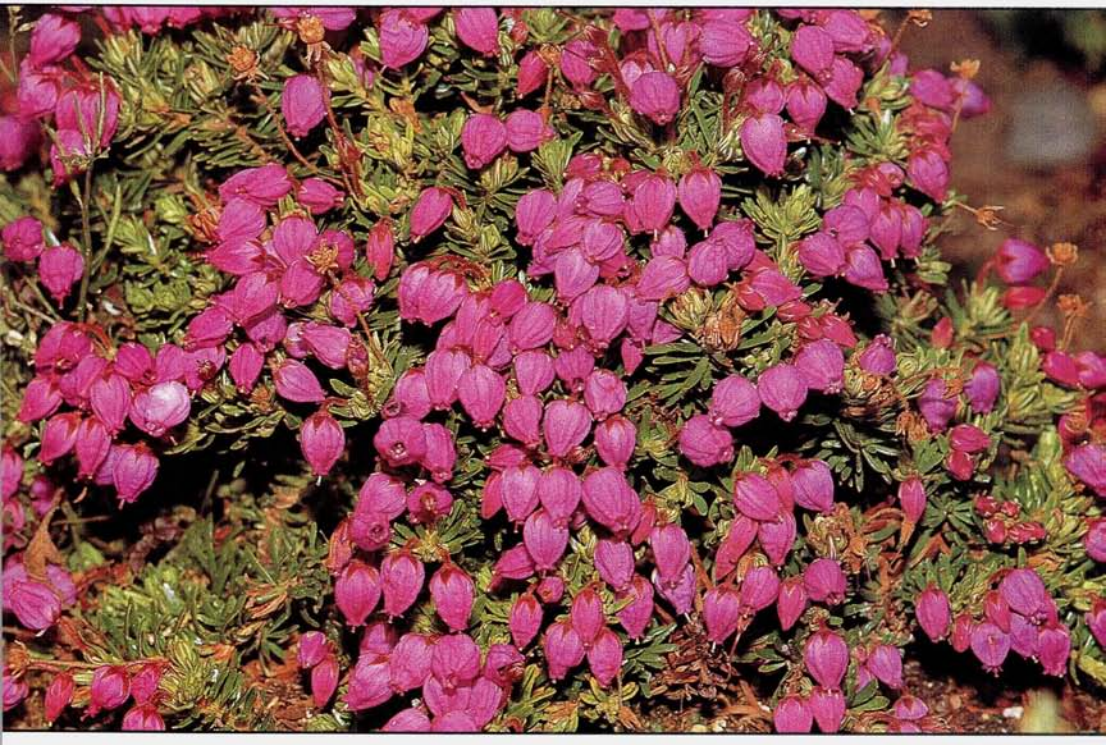
Art Dome specializes in ericaceous plants and tries to acquire all and any he can grow in his garden. He is also an avid photographer of all ericaceous plants.

Phyllodoce breweri (p. 20)

photos, Arthur Dome

Phyllodoce caerulea (p. 20)



Phyllodoce x *intermedia* (p. 20)

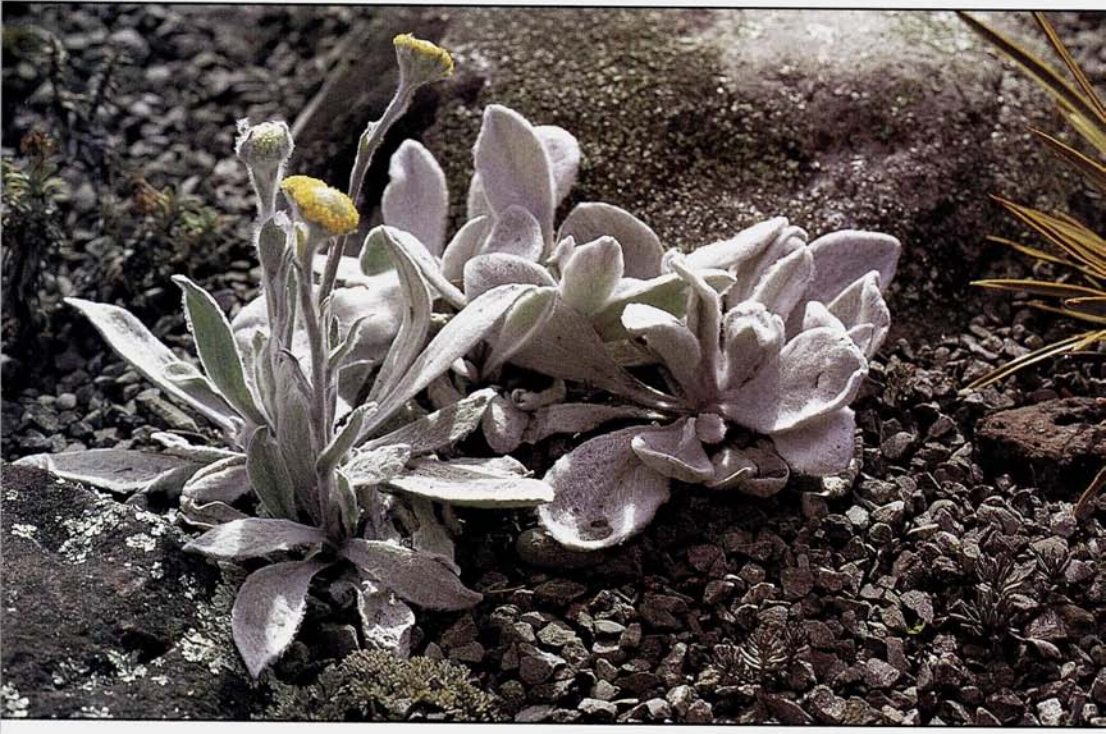
Cassiope lycopodioides (pp. 18-19) photos, Arthur Dome

Raoulia eximia (p. 30)

Phyllachne colensoi (p. 30) photos, Ethel Doyle

Aciphylla montana, male and female plants (p. 32) Ethel Doyle

Craspedia incana (p. 30)



Leptinella atrata (p. 31)

Celmisia sessiliflora (p. 31)

Ranunculus haastii (p. 31)

Ranunculus insignis (p. 29) photos, Ethel Doyle

Ranunculus crithmifolius (p. 30)

Chionohebe pulvinaris (p. 30)

Gentiana divisa (p. 32)

Ourisia caespitosa (p. 29)

Raoulia grandiflora (p. 31), *Scleranthus uniflorus* (p. 30) photos, Ethel Doyle

PLANTS OF MT. HUTT

A NEW ZEALAND PREVIEW

by Ethel Doyle

Mt. Hutt is very familiar to me. I see it from my kitchen window every day, and I have explored its slopes many times over the years. A trip up this mountain is on the venue for the 1996 International Conference program, so it might be of interest to know some of the plants that grow there. Of the 600 species of alpine plants in New Zealand, 94% are found in no other country, and 70% of these are found only in the South Island. Our alpine plants are rather special!

The first we see as we start up the mountain is *Celmisia spectabilis* var. *magnifica* on the banks above the road. It grows in association with red tussock (*Chionochloa rubra*) and is plentiful where the grasses have been weakened by fires. Therefore, it is one native plant that has benefited from the introduction of sheep farming, because they have burned off the dry tussocks so that new shoots more palatable to the sheep appear. It is a most attractive daisy with thick, leathery leaves furrowed above, the lower surface covered with soft, felt-like, buff or white tomentum—which also covers the stout flower stalks and buds.

At our stop at a corner of the road with a grand waterfall, we see *Celmisia lyallii* growing among the snow tussock (*Chionochloa rigida*). It is easily recognized by its rigid, leathery, sharply pointed leaves about a foot high. Above the waterfall strong stems of *Dolichoglottis* (*Senecio*) *scorzoneroides* will in January carry masses of large, white flowers, and *Dolichoglottis* (*Senecio*) *lyallii*, a more slender version, its deep yellow flowers. Hybrids between these two are often found.

Above the mats of *Raoulia australis* as we climb the bank there is *Leucogenes grandiceps*, the South Island edelweiss, its trailing branches covered with closely packed, sessile, silver leaves. It is a plant of exposed crags, its silver foliage adorned in summer with masses of golden flowers with white, cotton-wool bracts. On shady banks the creeping stems of *Ourisia caespitosa* (photo, p. 28) bear small, bright green leaves, and on fine stems the white, tubular flowers have a delicate beauty. *Euphrasia revoluta* is here, too, with similar flowers, but these have short, hairy stalks and hairy calyxes.

Ranunculus insignis (photo, p. 26) grows at the top of the bank, varying from a robust herb over 12" in height to a short, tufted plant only 6" tall. The thick, green basal leaves have brown hairs around their coarsely toothed margins, and the flower stems carry heads of yellow flowers with five to seven shining yellow petals.

Gentiana corymbifera has large rosettes of leaves and may already have buds. Its purple flower stems may be only a few inches tall or in a place with plenty of moisture may reach 3 feet.

A few yards to our right *Helichrysum selago* grows on the crags. This small shrub has crowded branches enclosed by thick, scale-like leaves. Between the crags one cannot miss many beautiful *Craspedia incana*, every part of the plants covered with fine white wool (photo, p. 24). The white buds become perfectly spherical, pale sulfur yellow flowers. *Wahlenbergia albomarginata* is a common plant, its delicately poised, blue bellflowers comparing favorably with the best campanulas.

Our next stop is very exciting as we may wander among flocks of vegetable sheep, *Raoulia eximia* (photo, p. 23). Most botanists who visit our country from overseas are keen to see this plant, as it is quite unique. The huge cushions are really amazing, their hard domes strong enough to carry a man's weight. One can see how the closely packed branch endings grow as a mass of hexagons forming these polsters, the whole surface felted with fine hairs. Some of the plants are very old.

In the scree between the rocks where the *Raoulia eximia* grows are two very modest plants. *Geranium sessiliflora* has basal rosettes of mottled purple leaves. One must look carefully for the leaves of *Ranunculus crithmifolius*, as its thick, gray-brown leaves match exactly the color of the scree (photo, p. 27). It cannot be overlooked, however, when its beautiful, shining yellow flowers appear among the leaves. Unfortunately for summer visitors, this occurs as soon as the snow melts in the early spring of September or October.

Among the tussocks and plants of *Celmisia spectabilis* to the right of the scree are a few plants of *Pratia macrodon*. This is one of the most beautiful and floriferous of creeping plants. The usually cream, highly scented corolla tube of the flower is long and cylindrical, split at the tip so that the lobes lie open and flat. This is much more attractive than the more common *Pratia angulata*, which has smaller, unscented flowers.

Cushions of *Scleranthus uniflorus* (photo, p. 28) are common in the shingle, their minute yellow foliage beautifully molded into hummocks of gold. *Helichrysum bellidioides* also grows in gravel along mountain roads and the borders of streams. In good forms the silver foliage is handsome, as are the heads of stiff, brilliantly white bracts. The *Acaena* species, or New Zealand bid-a-bids, also creep around in poor shingly places. They belong to the rose family, and the leaves resemble rose leaves in miniature. In *Acaena fissistipula*, which grows here, the leaves are deeply toothed and tinged with red. Erect stems bear the round, club-like, spiky fruiting heads.

As we walk towards the steep scree at our *next* next stop we see small cushions of *Chionohebe (Pygmaea) pulvinaris* (photo, p. 27) and *Phyllachne colensoi* (photo, p. 23). The latter forms a mat of closely set, small, rigid, green leaves, and the stemless, white, six-petalled flowers can completely cover the cushion. The gray-green cushions of the *Pygmaea* are perfectly rounded

and soft-as-velvet—absolutely charming when covered with stemless, white flowers. This is one of my favorite alpines and one of the easiest of the alpine buns to grow in the garden.

A very common and desirable scree plant is the first we see here—*Leptinella* (*Cotula*) *atrata* (photo, p. 25). Its finely divided leaves curl back and vary from green to purple. The flower stems each carry a single button-like head, almost black, with a glowing ring of golden stamens, a most striking plant. *Cotula dendyi* is less common but also less attractive, with flowers of a rather drab yellow.

On this scree we should see the queen of scree plants, our beautiful *Ranunculus haastii* (photo, p. 26). This is a true high alpine buttercup like *Ranunculus adoneus* in America, *Ranunculus alpestris* in Europe, and *Ranunculus parnassifolius* in Spain. This wonderful plant has deeply divided, fleshy, gray-green leaves exactly the color of the stones among which it grows. Its thick flowering stem has one or more large, open, shining yellow cups lovely enough to hold their own in any company. If the flowers are past, the large, round seed heads in the same pinkish-gray of the leaves are also beautiful

Haastia recurva grows above 5000' on only a few peaks in Mid-Canterbury. It forms a clump 3-4' across, the leaves thickly covered with fawn indumentum, while at the ends of branches a rosette of gray leaves holds the white flower heads. *Haastia sinclairii* is similar, but it does not form a clump, its shoots rather appearing at random through the scree. *Hebe haastii* and *H. epacridea* grow here, too, and have the usual four-sided arrangement of their rounded green leaves on trailing stems enhanced by the profusion of white flowers on their tips. *Hebe haastii* grows at higher elevations, also, and is one of the last plants to be found as one climbs to the top of the mountain.

In the herb fields above the ski lodge are two of my favorites. *Celmisia sessiliflora* (photo, p. 25) makes lovely gray mats with its awl-shaped leaves growing closely together. Daisy flowers open deep in the leaves but the stem elongates a little as the seed develops. *Raoulia grandiflora* (photo, p. 28) also forms silver mats and is one of the most beautiful of small-foliaged plants with its regular rosettes of bright silver needles, each so close to the next that the plant resembles a silvery kabschia saxifrage. The flowers open from the center of the rosettes, and their white bracts can cover the plant. *Raoulia youngii*, with broader leaves covered with white wool, is a plant of higher peaks, but only a few plants grew here, and that was before the ski field owners started grooming the slopes.

By the stream, if it is a late spring, we may see flowers on *Caltha obtusa*, its white petals marked with veins among the bright green, heart-shaped leaves, each with two curious lobes turned forward so that the leaves appear to be double.

Celmisia angustifolia is to me THE *Celmisia* of Mt. Hutt. It is a widespread and variable shrublet, its leathery leaves with wavy margins grayish green above and white and rather sticky below. In good forms both surfaces are covered in white indumentum. Its slender stalks carry attractive white daisies, which make this a good garden plant, especially as it lives happily and flowers every year. Other celmisias may flower sporadically even in the mountains. You will have to look carefully if you wish to find the dainty *Celmisia laricifolia* as it creeps into shady crevices under other plants—its dark, needle-like leaves are

easily overlooked. The leaves of *Celmisia gracilenta*, also a dainty plant, are purplish-green marbled with gray, the edges rolled towards the midrib. It flowers freely from early spring on and is also common at lower elevations among the tussocks.

Our species of *Aciphylla* are commonly called spear grass or spaniards because of the sharp points on the leaves. In tall species such as *Aciphylla aurea* these can be 3' high with flowering stems to 6'. Our *Aciphylla montana* (photo, p. 24) is much smaller, at only 6-8", with attractive, bronzy, symmetrical leaves and frothy masses of cream flowers on the male plants.

Dracophyllum pronum forms prostrate mats of wiry, twiggy stems that twine crazily very close to the ground among the rocks.

At the top of the stream among moss and large mats of *Chionohebe* (*Pygmaea*) grows one of the loveliest of our gentians, *Gentiana divisa*, its rosettes of rather fleshy leaves tinged with red (photo, p. 28). The short flower stems end with a ball of tightly packed white flowers.

At approximately 7000', on the crags above the gentians, grows our other vegetable sheep, *Raoulia mammillaris*, growing also on a few peaks in Mid-Canterbury. It inhabits rock crevices and is never as large as *R. eximia*, which grows here, too, but makes only small cushions. It can be difficult to distinguish the two. The hairs on *R. eximia* make it appear soft and velvety, but *R. mammillaris* is quite hard and hairless, and the small hexagon ends of its shoots can be readily seen.

These are but a few of the plants of Mt. Hutt, and Mt. Hutt is but one of the many mountains in our beautiful small country. Many are to be visited on the pre- and post-conference tours in 1996, and all have their own large populations of interesting and unique alpine plants. Please come visit us in 1996—I am sure you will enjoy your stay and return feeling it was really worthwhile.

Ethel Doyle has been gardening for 50 years and has pioneered rock gardening in her area of New Zealand. Her interest in alpines has taken her to the mountains of Europe, America, and Kashmir. Seeing *Paraquilegia grandiflora* on the sheer, wet cliffs of Kashmir was literally one of the high moments of her life—14,000'! Special plant interests include rhododendrons of all shapes and sizes, *Acer palmatum*, and, at the moment, *Corydalis* and *Meconopsis*.

The climate of her garden includes very hot summers and cold winters. Snow is usual and often at very inconvenient times, as she is quite close to the mountain. Very hot winds come over the mountains, also, like the chinooks of North America. Her soil is poor and stony—the heaps of stones in her paddocks inspired her to start rock gardening.

SOUTH AFRICA

Part II

by Panayoti Kelaidis

Mention proteas and people think of Hawaii, Macadamia nuts, and those gigantic lacquered flowers that look like and last as long as Fabergé jewel boxes. Yet, if you read between the lines, many flower books and floras suggest that proteas (and not just a handful of species) grow in high, cold, and even dry places in South Africa.

There is something of the dreamer in every rock gardener. No one who seeks to grow plants from the world's stark peaks in a compact urban setting can be accused of practicality. This art approaches poetic yearning when we seek to recreate nature on a city lot. But even rock gardeners find it hard to believe that proteas might actually be coaxed to grow on the cold high plains of Colorado. This really stretches the imagination. In such cases gardening approaches science fiction. Yet finding, photographing, and obtaining seed of lofty mountain proteas on the Drakensberg of South Africa was high on my wish list for my expedition in January of 1994.

In my first article on South Africa (*Bulletin of the American Rock Garden Society*, Vol. 52, pp. 145-196). I described my first week of travel through the better-known biomes of the South African vegetation. There was the fantastically diversified fynbos that occurs on sandstone derived soils in an arc a few hundred miles north and west of Cape Town. This vegetation is roughly equivalent to the macchie of the Mediterranean and the chaparral of California. Next, I explored the Roggesveld escarpment, the coldest part of the karoo, the arid interior vegetation of South Africa that corresponds to north temperate steppe, approximating the intermountain drylands of the American West. At last Koos Roux and I arrived at the Drakensberg Mountains, exploring them from the north and west. The Drakensbergs are summer-wet and winter-dry, opposite seasonal pattern of moisture to those of the fynbos and most of the karoo. As a result, each of these ecological provinces has its own unique flora. This article details our further explorations of the Drakensberg range from the eastern and southern sides.

During initial forays through the fynbos all around Cape Town, gigantic proteas were everywhere in ludicrous abundance. There was *Leucodendron*,

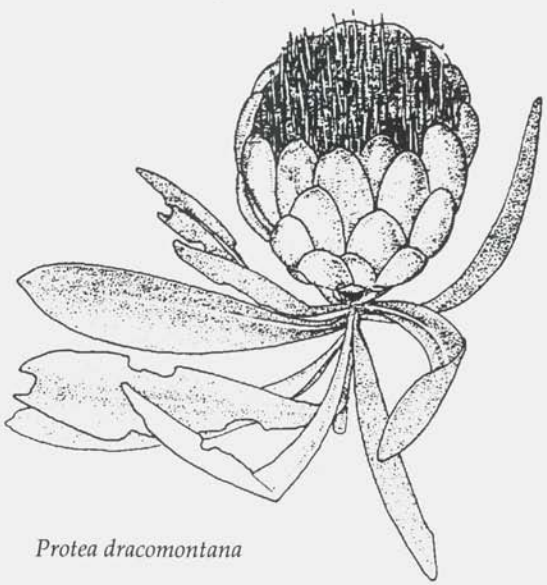
resembling a cross between a magnolia and Russian olive. There were numerous giant-flowered *Protea* species, with hundreds of gigantic grandfather-clock-face blossoms in various Victorian hues of purple, magenta, pink, scarlet, and crimson. And to complete the exotic atmosphere, sunbirds were perched everywhere.

But one *expects* to see proteas in the subtropical foothills—especially near the sea. What I did not expect was that proteas would be the most prevalent woody species across the entire east face of the Drakensberg. I was even more astonished to see gigantic arboreal species growing at elevations more than a mile above sea level.

These were not the only surprises on the east face of the Drakensberg. There were occasional tree ferns (*Cyathea dregei*) growing up to 20' tall and terribly exotic-looking plants like cabbage trees (*Cussonia*) with umbrella-like heads of huge, palmate leaves covered with white fur. More than once we drove through small forests of giant aloes (*Aloe ferox*). There was even one rare cycad surviving on protected reserves (*Encephalartos ghellinckii).* All can occur well over 2000 meters in areas subject to frequent and severe frost. We in winter-cold climates have hardly begun to tap Africa's horticultural wonders.

The protea that reaches the highest and has the greatest potential altitude for hardiness in continental climates of the Northern Hemisphere is *Protea dracomontana* (photo, p. 38). It is a dwarf shrub found at higher elevations throughout the "Little Berg" (a term used for the largely sandstone foothills leading up to the colder, basaltic summit plateau of the Drakensberg).

What a surprise to drive onto a pass not far from Harrismith, walk a few hundred feet onto meadows filled with countless hundreds of *Protea dracomontana* loaded with buds, flowers in full bloom, and all the seed one could possibly hope for. All at the same time! As is the case with most plants in this remarkable family, this namesake *Protea* of the Drakensberg blooms over an extended period of time. Seed persists in the nodding remains of the blossom for months, until fire or weather disperses it.



Protea dracomontana

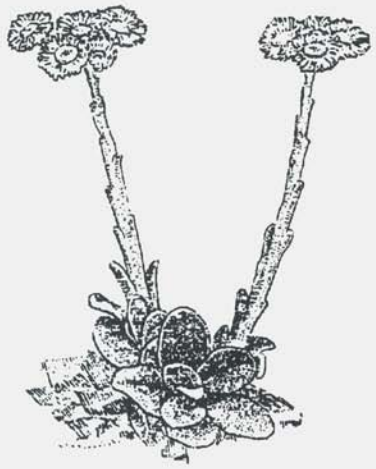
The *Protea dracomontana* grew here on exposed ridges and slopes at the base of a high plateau dotted with tree proteas (*Protea subvestita* in the valleys, *Protea roupelliae* on open slopes) at approximately 7000'. The small proteas seemed to be restricted to rather raw mineral soil, a yellowish, decomposed sandstone. Many tiny herbaceous plants and sparse grasses grew among these gaunt,

shrubby proteas, which reminded me of tiny madrones (*Arbutus*), since they have similar obovate, leathery leaves. Or maybe they are more like somewhat straggly, giant-leaved manzanitas (*Arctostaphylos*).

Yet the flowers were perfect miniatures of King Proteas, 3" across or even wider. The same waxy, petalloid bracts formed the globular head, the centers filled with a fantastic extravaganza of staminodes or pistils. Each head of bloom was a slightly different shade of pink or rose or purple.

As if the proteas weren't enough in and of themselves, they grew above a more or less continuous carpet of *Erica cerinthoides*, that fabulous scarlet heather almost as high on my wish list as the protea. I must have really puzzled the overly friendly Saint Bernard from the nearby inn who decided to follow us around that morning. I suppose he was making sure we didn't dig up any of his bones. I would examine first this protea, then look inside that one. Take a few more pictures here, but then what's that over there? More *Erica*, sometimes pale salmon, more often a pinky white. This population lacked the really bright scarlet colors I had seen at nearby Harrismith Municipal Botanic Gardens. The heather at that gardens was almost 4" tall, but these out on the harsh clay were just a few inches tall, making threadbare, but still desirable mats rather like their European cousins we all love and grow. I would have been discouraged had I not noticed many shrubby and herbaceous plants hereabouts that thrive under cultivation in Colorado—many of the same ubiquitous *Helichrysum* (for instance) have grown in Denver for years.

It will take many years to properly evaluate the real limits of hardiness of South African *Erica* and the proteas from the Drakensberg, not to mention



Helichrysum adenocarpum

the hundreds of kinds that grow on frigid mountains throughout the karoo and fynbos provinces of South Africa. (The fynbos, as you may remember from my first article, is a floristic province of extraordinary richness that occurs on sandy substrates near the Horn of Africa; karoo occurs on arid, more fertile soils usually farther from the sea). There is every likelihood that many species will prove adaptable in the inland mountains of the Southwest, in New Mexico, for instance, or much of Texas. Why wouldn't the Drakensberg species thrive in the cooler uplands of the Appalachians, such as those of western North Carolina? The key ingredients in growing them well will probably be good drainage, a deep scree soil, and freedom from too much crowding. In other words, these are proteas ideally suited for the rock garden. Rock gardens are likely to be the only horticultural environment in which they will survive and grow. We fall in love with rock gardens for their aesthetics, but truly they are the only

sensible way to grow many choice plants from all over the world.

As you pass from the grasslands of the Orange Free State into what is now Kwa-Zulu Natal province, the landscape changes dramatically in mood and management. There is much greater rainfall on the far side of Oliviershoek Pass; a sudden wealth of trees and shrubs appears at lower elevations. The trim farms and prosperous ranches of the Orange Free State are replaced with large tracts of what were once "homelands," the settlements where Zulus have lived for hundreds of years. The proud, flamboyantly attired villagers contrasted dramatically with the overgrazed, decimated landscape they occupy. The national government made no attempt to educate black South Africans in sound land use. Both custom and survival have encouraged maximal use of grazing animals.

As we drove south along the base of the Drakensberg, winding in one valley and out the next, I was continually struck by the impact on native vegetation in the Zulu lands. Deep dongas—arroyos cut by sheet erosion—made whole hillsides into desolate canyons. There were pastures crowded with four or five kinds of grazing animals. Where the road crossed onto a stretch of nature reserve or some private hunting lands, the savannah suddenly would be filled with a bewildering variety of wild flowers: *Aloe, Brunsvigia, Dierama,* even more *Helichrysum, Moraea, Kniphofia, Watsonia*—all of these recognizable from a distance. They must have been all but extirpated on village lands nearby. South Africa is now poised to undergo massive redistribution of lands, and the impact of this change in ownership on the native flora is certain to be profound. Let us fervently hope that as more relatively pristine grassland and forest are brought under control of the black population that conservation will be considered. Will natural vegetation once again be reestablished in the former homelands? The extremes of land use in South Africa must serve as a warning to us. We can preserve and set aside all the land we wish, but until social justice prevails, nothing will truly be secure. We as rock gardeners have a great stake in the extraordinary biotic diversity of South Africa. Politics and plants are inextricably intertwined, whether we like it or not.

The brooding escarpment of the High Drakensberg was visible the next morning, rising over two miles in vertical height above the Indian Ocean to the east. By afternoon, the monsoonal clouds closed in. Almost every day from October to February a torrential downpour drenches the higher peaks. The highest elevations of the Drakensberg are a deep green in summer, and there are waterfalls, bogs and streams everywhere. Every major drainage on the east face of the Drakensberg seems to boast a luxurious resort hotel complex at about 5000' elevation. Here prosperous people from the steamy lowlands escape for a few weeks of summer coolness. Each valley has its share of choice endemic plants and local specialties—most of which have never been introduced to cultivation in the Northern Hemisphere. Since most of the east face of the Drakensberg lies either in the Kingdom of Lesotho, a national park, or under the supervision of the Kwa Zulu Natal Forest Service, collection of germplasm is regulated. South Africans live primarily in the subtropical lowlands, so no one thinks to collect plants from the Drakensberg for cultivation. These plants are hard to grow in the lowlands because they are adapted to cold winter temperatures.

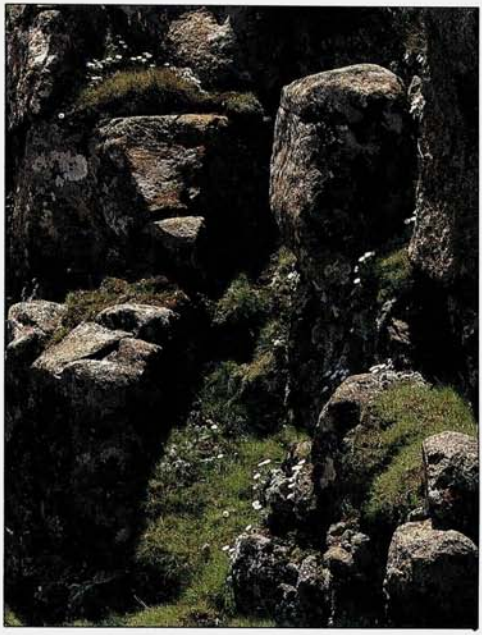
Helichrysum sessiloides in garden

Helichrysum sessiloides in nature (p. 43)

photos, Panayoti Kelaidis

Helichrysum bellum

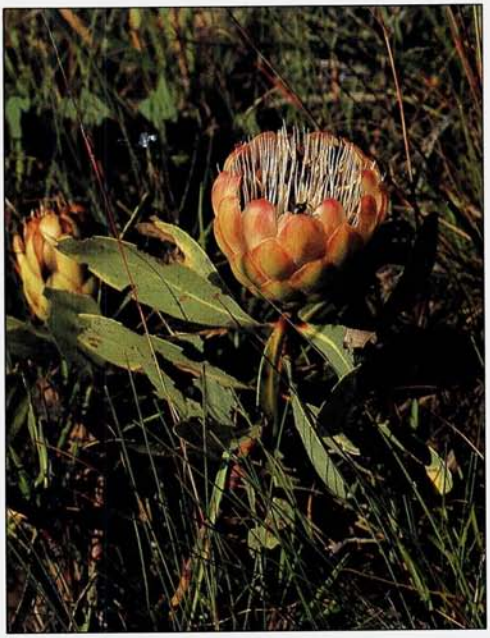
Helichrysum ssp., Sani Pass

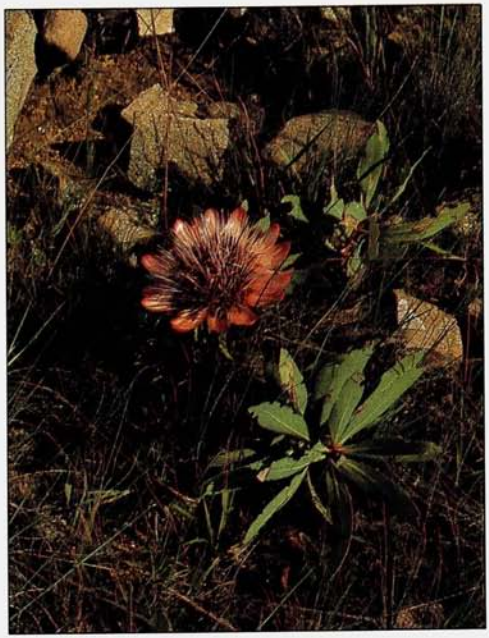


Sutera aurantiaca (pp. 41,42)

photos, Panayoti Kelaidis

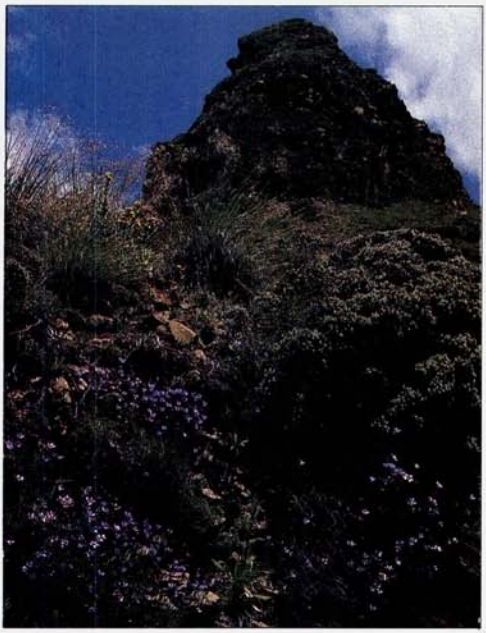
Protea dracomontana (p. 34)



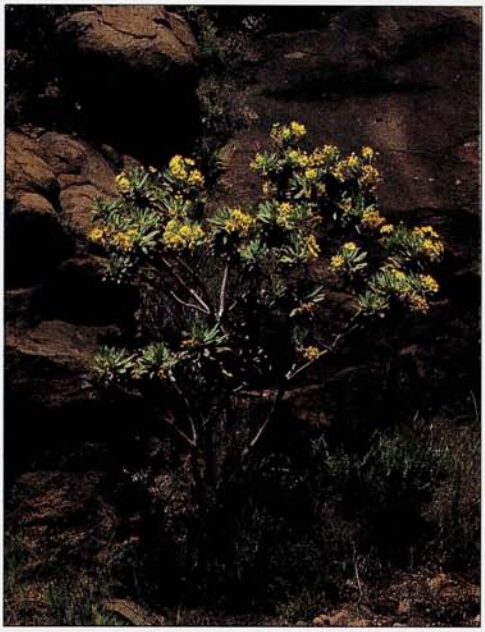


Euryops candollei, with yellow flowers, on Bastard Voetpad (p. 41)

Euphorbia clavarioides, on Naude's Nek (pp. 50,52) photos, Panayoti Kelaidis



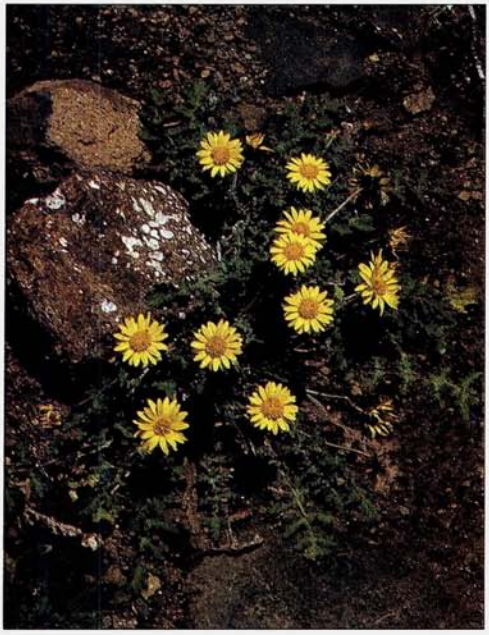
Wahlenbergia undulata, Sani Pass (p. 41)



Euryops evansii

photos, Panayoti Kelaidis

Venidium arctotoides, Sani Pass (p. 42)



Dierama robustum, Mont Aux Sources

Every time we stopped the car, it seemed as if there were a completely new assemblage of plants. The diversity of species in the Southern Hemisphere is much, much higher per acre than anything you might have seen in the Northern Hemisphere. Biologists attribute this diversity to a number of climatic and geologic features of this region. One has a sense that angiosperms have enjoyed a certain stability here that encourages them to specialize and proliferate.

Late in the afternoon we reached our destination at the resort hotel complex at the base of Sani Pass. The Sani Pass road is the only serviceable road crossing the Drakensberg escarpment from Kwa Zulu Natal province into Lesotho. Indeed, this is the main artery provisioning the entire northeast quadrant of Lesotho with industrial products, so a constant procession of heavily laden trucks and jeeps climbs the steep and rugged highway toward Mokhotlong, usually coming back to RSA quite empty.

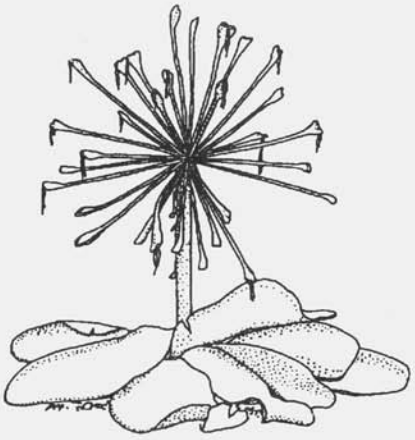
My two-wheel-drive Nissan rent-a-car was not permitted to make the climb to the border crossing, but we were told we could easily hitch a ride to the top.

The next morning Koos Roux and I queued up first thing at Lesotho customs. It wasn't until quite late that morning that I realized we'd made it practically to the summit of the pass—eight miles and almost a vertical mile above the starting point—and the only vehicles that had passed were two overburdened trucks with no room to spare.

So rich were the hillsides tumbling down to the highway, so cool the breeze all day, so enchanting the flora, that in my imagination I will climb this mythical highway again and again for the rest of my life. In mid-January the meadows of the Drakensberg are at their peak bloom. Acres and acres of showy shrubs—several large species of *Euryops*—form billowy mounds of yellow (photo, p. 39). *Helichrysum* species are everywhere, in every shape and form from tiny mats to husky shrubs, also mostly in shades of yellow (photo, p. 46). Two species of tree-form *Protea* climb almost to the high escarpment, and there are immense drifts of *Diascia integerrima*, geraniums in great variety and so much more. Many rock outcrops were rimed with the succulent foliage of *Haemanthus hirsutus*—that amazing amaryllid with twin, leathery leaves margined in ermine and extravagant, ludicrous balls of frilly, white flowers that give way to bright red berries. Amazing! They grow by the hundreds out of the cliffs. Another chasm sparkles with the giant crimson flowers of *Gladiolus flanaganii*, a short-stemmed bulb pollinated by sunbirds.

The roadside barrow ditches were full of treasures. *Wahlenbergia undulata* (photo, p. 40) formed clumps with dozens of huge flowers, and looked like a cross between *Platycodon* and a Scottish harebell. Here and there a *Chironia* mimicked the way *Eustoma* grows in the Great Plains; and the two are related. But for me, Sani always brings the genus *Sutera* to mind, for here I found the greatest concentration imaginable of these showy plants. This endlessly variable genus of Scrophulariaceae is restricted to South Africa. It contains approximately 140 species, and a major center of its diversity is the Drakensberg. There were mats of deep rose-purple *Sutera breviflora* (photo, p. 47) reminiscent of a *Mimulus*, spreading widely. This bloomed prolifically in the Rock Alpine Garden only a few months after seed was sown last year.

Sutera aurantiaca (photo, p. 38) looks similar, with even larger flowers of a



Boophone sp.

wonderful burnt orange-red. There was no sign of seed on this, alas. One or both species appeared to have crossed here and there with *Sutera pristisepala,* an intensely aromatic subshrub that seems to prefer to grow in crevices of cliffs or very rocky hillsides. The tiny pink flowers don't attract attention from a distance, but close up they are fantastically intricately flecked and striped with darker red, black, and white, making a wonderful spectacle up close. The whole plant glistens with intensely aromatic, glandular hairs.

Another cliff appears, this time draped with a dozen or so large vegetable sheep of some new unidentifiable cushion *Helichrysum.*

On Mont Aux Sources we had seen a deep purple *Sutera campanulata* (photo, p. 47) growing among spritely *Hebenstreitia fruticosa* (photo, p. 47). Several years ago I obtained seed of *Sutera jurassica,* a rare, mat-forming species that is apparently restricted to a few spots along the rim of the Natal Drakensberg, notably at Sani Top. *Sutera jurassica* has been one of the most delightful new, miniature carpeters in the Rock Alpine Garden, blooming non-stop from late spring to early winter. For several months last summer at Denver Botanic Gardens we had red, white, blue and yellow suteras all blooming at once. The yellow species was a tiny-flowered bog plant from the East Cape notable mostly for its distinct hue.

The white-flowered species that shone this past summer at Denver Botanic Gardens was a wispy and still unidentified plant we found on the Roggesveld escarpment in the Great Karoo. In the garden it produced a mound of vivid white a foot or more tall and a foot across in its first year from seed, with literally thousands of little snapdragons, reminding several visitors of *Penstemon ambiguus* from a distance. This genus obviously holds great promise for temperate gardens.

I took as many notes as I could; there was such an extraordinary assortment of new genera and lovely flowers. *Osteospermum jucundum* (photo, p. 48) reappears on Sani Pass; here it is a tiny form with pure pink flowers rather than the sumptuous violet-purple we saw on Mont Aux Sources.

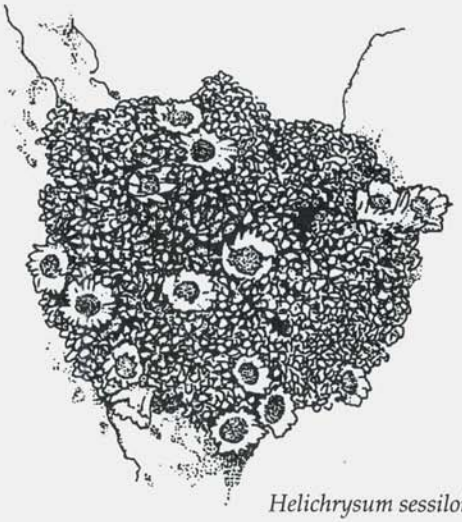
There were so many new genera of composites, among them *Venidium,* represented by *V. arctotoides* growing along the verges of the road with coarsely toothed leaves and bright yellow daisies (photo, p. 40). And there was always a local form of *Berkheya,* the thistle daisies found all over the Drakensberg, usually in bright yellow colors. All the way up the pass a dizzying variety of vigorous perennials filled the meadows, and huge cushion *Helichrysum, Euphorbia clavarioides* (photo, p. 39), and other chasmophytes clung to the cliffs. The last mile or two below Sani Top the road steepened and formed ever tighter switchbacks.

By now it was almost noon, and the sun was beating down intensely. Koos had disappeared from sight hours earlier, and I was a little anxious. I had noticed a chalet-like building, a small hostel with a wonderfully welcoming bar, winking over the top of the hill, and I was a little impatient as I climbed up the brow of the hill.

There a meadow of the tiniest cushion plants in such sparkling bloom greeted me. I instantly forgot my companion, the beckoning beers, and, alas, even my wits. Hundreds of tiny *Hesperantha*, that bright rose-pink flowered genus of irids endemic to South Africa, bloomed in the fine turf (photo, p. 48). There were yellow gentians (*Sebaea*) and deep purple *Romulea*. Tight clumps of campanula-like *Craterocapsa* made bright blue cushions of color, and several tiny *Helichrysum* wove delicious mats in and over the stones. Here again was the rock hard *H. sessiloides* I kept finding everywhere (photo, p. 37). My God, suddenly, here was *Helichrysum glaciale*, one of the principal wishes of my trip! It is a stunning little plant with silvery mats of foliage and stems an inch or two high bearing pearly cups of bloom: it is a perfect alpine (photo, p. 45). I got on my hands and knees, took one, then two, then three pictures. There were flowers and buds, and fluffy, billowing seed as well—all a sign of a long-blooming plant! There were flowers by the hundred, by the thousand!

Just then a raucous pack of Basotho children spilled over the hill screaming and leaping for joy—a tourist! They crowded around me, hands in my face, laughing and giggling and having a great time. The children dragged me away, the world of cold beers re-entered my consciousness, Koos reappeared. Surely, I thought, I will see more *H. glaciale* later. But I didn't. All the plants every where kept being new. But the pictures turned out to taunt me. Thank heavens I remember exactly where they grew on that hill. I shall return!

When finally reaching Sani Top at almost 9000', a large, bowl-like valley five to ten miles in extent greeted me, rising on three sides to stark, rounded, basaltic peaks of great drama and beauty: the Black Mountains of Lesotho! One could spend many,



Helichrysum sessiloides

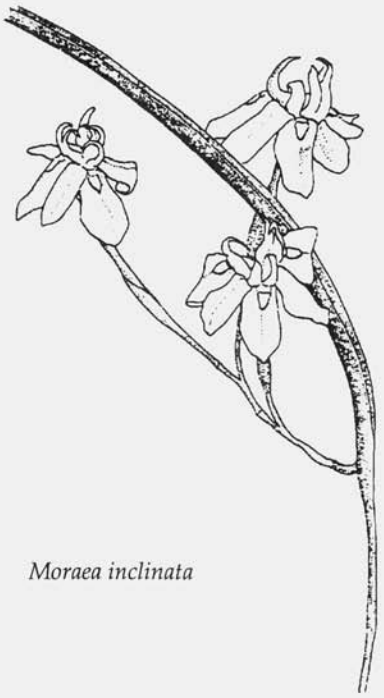
many days in this one spot and not begin to exhaust it. The ground was an absolute tapestry of color. At least three species of *Rhodohypoxis* formed thick patches of color in all the depressions, pure white, soft pink, and deep purple-rose. Numerous species of bulbs were there, including giant clumps of *Moraea alticola* with a few biscuit yellow flowers still open, a dozen or more tiny shrubs: *Clutia nana, Erica* galore, *Euryops depressa, Eumorphia, Helichrysum praecurrens, Passerina, Senecio seminiveus*. On and on and on it went as far as the eye

could see. Sweet smells wafted on the chilly alpine breezes.

The meadows were heavily grazed by sheep, and large summer camps of Basotho herders were pitched a half mile or so from the tourist hostel.

After a few stiff drinks, we set off toward the first rocky outcrops. Once again, new species of plants popped up right away: three or more tiny *Crassula* crowded the margins of freshets, including a robust form of *Crassula setulosa* ssp. *curta*, that tiniest and most adaptable of Drakensberg crassulas (photo, p. 45). Next was *Helichrysum milfordiae*, (photo, p. 45), one of the few alpine helichrysums that has a history in gardens. It formed mats in all the crevices of one large boulder, in places a foot or more across, all with large, white heads with pink backs to the ray flowers, very much like what I grow at home. What fun it is to find these in the field.

Sean Hogan and Parker Mache-



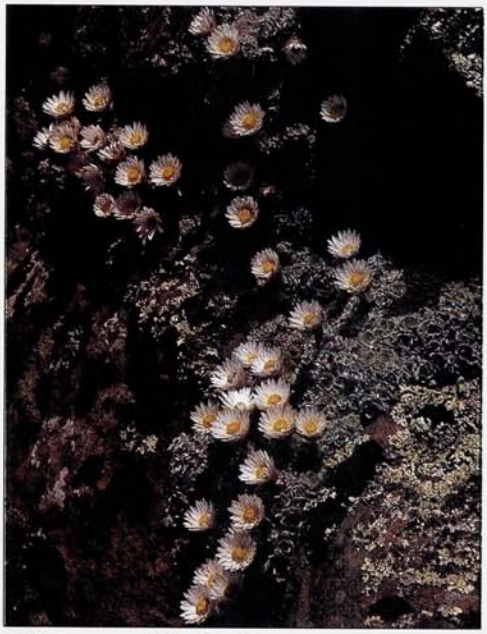
Moraea inclinata

Sanderson had alerted me to two distinctive mesembryanthemums that we would find here. Growing flat in tiny crevices of large boulders was the first, a tiny thing with deep purple-black rosettes and tiny white flowers less than a quarter inch across. This is a still undescribed *Delosperma* that I had seen the year before at Royal Botanic Gardens at Edinburgh labelled "*Mossia*" sp., which it surely isn't. Whatever the plant is, it is sure to be one tough little grower. It blooms all summer long in Denver and keeps its deep maroon color in summer as well.

Nearby in the grass we came upon the second *Delosperma* in plump seed. This was a giant-seeded plant forming dense tufts of lime-green foliage. It had been heavily grazed by sheep, although the capsules were flat enough to the ground that they escaped uneaten; the leaves had been nibbled to the base on most specimens. In a few months this bloomed profusely in the Rock Alpine Garden from the Hogan-Sanderson collection; imagine a clump-forming *Delosperma nubigenum* with even larger flowers that form perfect nosegays. The flowers have pure white centers. Needless to say, since it grows in such moist meadows, this promises to be an even more adaptable taxon, better suited to the smaller garden.

I chuckled to see so much *Leontonyx squarrosus*, the South African rendition of *Leontopodium*. It grows much as edelweiss does all over Eurasia, as a common element of dry meadows. Koos reminds me again that we must hurry and head back down, since Lesotho customs will close at 4 p.m. We flag the first truck that passes and brace ourselves in the back for a carnival ride down switchbacks; it would have done justice to any action film.

As we packed ourselves back into our own car at the bottom of the pass,

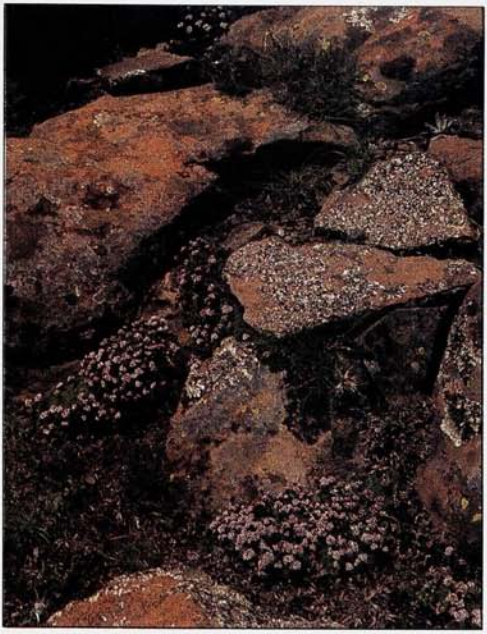


Helichrysum milfordiae, Sani Top (p. 44)

Helichrysum glaciale, Sani Pass (p. 43)

photos, Panayoti Kelaidis

Crassula setulosa ssp. *curta* (p. 44)



Gladiolus saundersii, Joubert's Pass (p. 51)

Naude's Nek (p. 50)

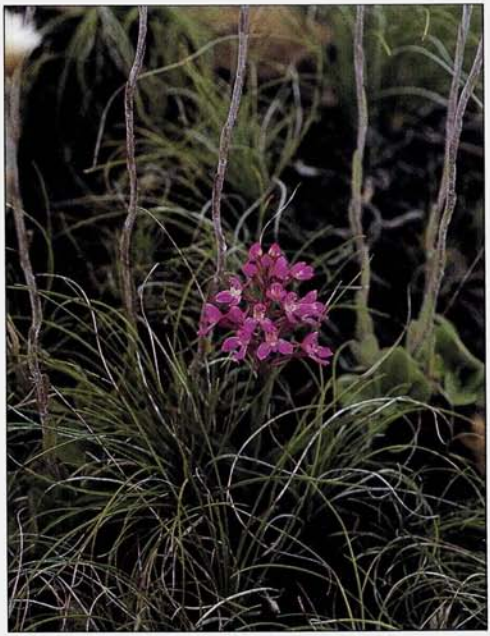
photos, Panayoti Kelaidis

Helichrysum, Sani Pass (p. 41)

Nemesia cf.*capensis*, Platberg

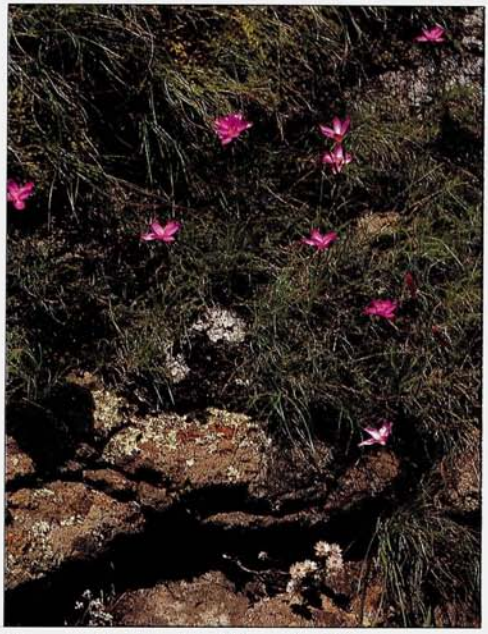
Sutera breviflora (p. 41)

Disa frigida, Mont Aux Sources



Hebenstreitia fruticosa and *Sutera campanulata*, Mont Aux Sources (p. 42)

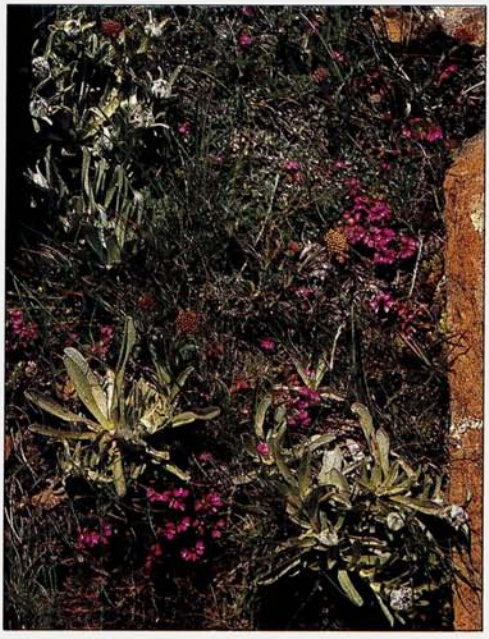
Aloinopsis spathulata in garden



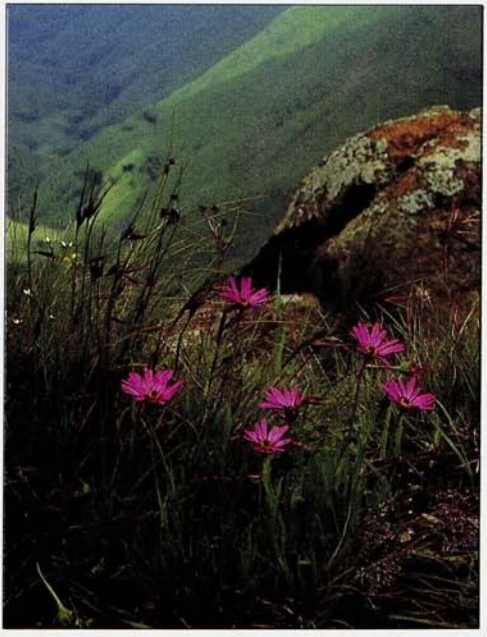
Hesperantha sp., Sani Pass (p. 43)

photos, Panayoti Kelaidis

Polygala sp., Sani Pass



Osteospermum jucundum, Mont Aux Sources (p. 42)



my brain was reeling with impressions of extravagant scenery and the seemingly endless array of new and wonderful alpines—so few of which are available from any nursery, hardly any of which are seen on seed lists, and so many of which were not yet in seed that day.

Deep in that January night, in the elegant dining room of the Sani Pass Hotel, I marvelled that a place of such drama and beauty, with such a rich flora should still be so little known and visited by the world's alpine gardeners. You have no idea what you're missing!

From Sani Pass Hotel the next morning we drove along the base of the Drakensberg through Transkei, one of the largest and least friendly of the African homelands. We had been warned not to drive through the Transkei; several people had been shot along that very road. But driving back along the eastern and northern Drakensberg would have added many hundreds of miles to the trip. Few people were in evidence that morning, and none of them seemed to even notice our vehicle as we sped along. We just had to stop several times to examine things like giant red-hot pokers in pure pink; they turned out to be a giant *Disa* orchid. Outside MacLear there was a purple haze on a cliff that demanded investigation It turned out to be a tiny, prostrate *Delosperma* (DBG 329), one of the showiest succulents we saw on this trip.

Our last two days of field work were spent exploring a small part of the East Cape Drakensberg and Witteberg, a region of stark peaks and parkland with yet another assortment of dramatically beautiful wildflowers. This is the southern extremity of the Drakensberg range, where it reaches its coldest latitudes. The high, cold tablelands around Rhodes and Barkly

Helichrysum chionosphaerum

East are famous for being the coldest inhabited parts of the country. A few isolated towns offer comfortable base camps to explore the higher peaks. We stayed in the pastoral village of Rhodes, where I was completely charmed once again by the simple elegance and hospitality of South Africa. Our rented cottage was filled with antiques, we enjoyed a lavish, delicious multi-course banquet every evening, and the grounds were planted artistically with masses of showy perennials, complete with rose bowers in full bloom. I blush when I compare the inexpensive, attractive accommodations in South Africa to the dreadful motels of our poor West.

Be prepared for torrential rains. We were stranded on one road for several hours as the innocent little freshet swelled to incredible proportions, flooding all the bridges we'd crossed on our way up the pass. The

Drakensberg Mountains here aren't as dramatic as they are farther north, perhaps, but the high slopes of Naude's Nek, Ben MacDhui, and Bastard Voetpad are honeycombed with many serviceable roads. In late January the landscape is lush and green and filled with a dizzying variety of exotic and novel alpines. On one road alone we came across six species of *Kniphofia*, each unlike anything I'd seen in cultivation. There was *Kniphofia hirsuta*, a tiny species with finely hairy leaves. *Kniphofia triangularis* formed dense patches on Naude's Nek, a vibrant red- and-yellow flowered form altogether different from the cool orange in cultivation.

There were drifts of *Selago galpinii*, a close relative of the *Scrophularia*, with deep cobalt corymbs up to 8" tall. Everywhere there were bulbs in bud, in bloom, and in seed; the cool salmon-colored *Gladiolus oppositiflorus* ssp. *salmoneus* was possibly the most stunning. It was present in only one spot we visited, forming sparse colonies, growing a foot or 18" tall, so elegant and showy. I was particularly taken with *Moraea albicuspa*, like a particularly svelte iris, its segments tapering to a sharp point. There were *Rhodohypoxis* abounding in all the wet spots. *Hesperantha* was in full bloom, and others in full seed in a number of spots. On the very summit of Naude's Nek (photo, p. 46) the ground was carpeted with a bright yellow *Romulea* altogether distinct from all we'd seen, reminding me exactly of a crocus.

Dierama robustum

There must be times when the landscape dries out, for there were greater numbers of succulents than we had hitherto seen: several kinds of *Delosperma*, mostly with bright purple or white flowers; a *Stomatium*, a yellow, night-blooming Mesembryanthaceae here forming very tight mounds; and *Ruschia*, probably *R. putterillii*, particularly pulvinate. Thee latter is a shrubby mesemb with toothed leaves and fascinating purple, reflexed blossoms.

I had noticed *Euphorbia clavarioides* (photo, p. 39) on every quadrant of the Drakensberg we'd visited, but here at Naude's Nek it grew particularly abundantly. I saw one mound over a foot tall, looking like a basketball from the distance. Perched on top was a rodent busily gathering the ripe capsules. Unlike most euphorbias, the corolla of this species is subtended with comparatively huge petal-like glands, so the inflorescence is almost an inch across and very showy. The capsule develops to practically the same size, turning yellow and finally even bright red, giving a second season of horticultural appeal. This euphorbia has a special significance for lovers of succulents in Colorado, since out of bloom it looks almost

identical to our spineless hedgehog cactus endemic to the Uncompaghre Plateau, *Echinocereus triglochidiatus* forma *inermis*.

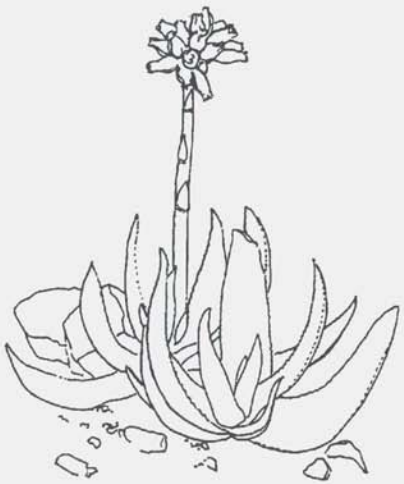
And of course, there are daisies: tiny gazanias like boutonnierres on the cliffs, dense mats of *Hirpicium armerioides*; and the white gazania, with a pitch-black stripe on the back side of the ray flower looking like giant Atlas daisies from a distance. A new assortment of *Helichrysum* are here as well.

If I had to choose one treasure among all those I saw, however, it would be the minuscule mats of *Zaluzianskya* that looked exactly like some bi-colored *Androsace* on the gravels at the top of the pass. Search as I might I found only flowers and buds.

For the last year I frequently find myself floating in my imagination over the steep, green slopes of the East Cape Drakensberg. I know that anywhere I could alight some new and amazing plant would greet me. This region must be one of the greatest treasure troves of horticultural resources available to our art.

Reluctantly, we finally had to tear ourselves away. Almost as an afterthought Koos suggested we go back over Joubert's Pass, at almost 8000'. We drove over a spur of the Drakensberg called the Witteberg, apparently a particularly dry and cold range. On the way up the mountain we saw two of the most magnificent *Helichrysum* species I encountered on the trip. One was the tiny, prostrate form of *H. chionosphaerum*, like an antennaria with giant, reflexed florets, the other a ground-covering creature we have yet to identify, which formed dense, plush mats a yard across, completely peppered with bright yellow, buttonlike heads.

Suddenly came a patch of hot orange. Then another. They were *Gladiolus saundersii* (photo, p. 45), one



Aloe ecklonis

of the flashiest and most beautiful of the genus. This bright orange gladiolus is abundant in Lesotho but only appears in a few places in the East Cape. The stems were approximately 2' tall, with huge, gaping, streaked flowers with a graceful, recurving shape unlike anything I'd seen.

As we climbed higher up the pass, once more a completely different assemblage of plants was arrayed before us. While gingerly driving through one of the sparse farmyards hereabout we saw a flash of hot magenta. Then another. When we stopped to examine our find, we could hardly believe our eyes. Here was a purple magenta cousin to the bright scarlet *Hermannia stricta* I'd seen a few weeks earlier on Hantamberg above Calvinia. Sterculiaceae—the Cocoa Family—isn't usually associated with rock gardens, but these trim cushions with petite umbrellas in various shades of red would look appropriate alongside any North Temperate alpine. Yes, there were *Euphorbia clavarioides* again, and a few familiar

Hermannia cf. stricta

plants, notably *Diascia integerrima*, which grew in such vast numbers in every possible kind of soil and exposure it amazed me. Here, too, was a tall, wand-like *Albuca* with yellow flowers; a taller, different *Hebenstreitia;* and a new *Selago*. On the summit of the pass, huge screes stretched in all directions. These were peppered with new treasures, such as a *Pelargonium* species that formed dense, silvery pads of filigree foliage and had 8" stems with pitch black flowers. Alongside it were silvery, succulent mats of a mesemb that reminded me of a delosperma at first—a blue-leaved *Delosperma nubigenum?* The flowers were on 4-5" stems and looked ridiculously like...my God, it's an *Othonna!* The last thing I dreamed of finding was a high altitude, succulent daisy!

Then a peculiar rosette, rubbery and deep purple. A few stems with their papery netted fruits were left here and there—*Anacampseros rufescens*, South Africa's answer to *Lewisia*. The rosettes were almost 3" across, usually single or in clusters of two or three heads. I surely never dreamed I would stumbling on a high altitude *Anacampseros*.

Less than a year has passed since I set eyes on these plants and so many others I have not had a chance to mention or describe. Many are bravely weathering their first winter in the Northern Hemisphere and looking no worse for the wear. Both the *Othonna* and *Anacampseros* have emerged from their first subzero spells just fine, thank you.

From the top of Joubert's Pass I looked out at the vast expanse of Lesotho to the northeast, across the serried plateau of the Witteberg itself to the Cape Drakensberg looming mistily to the east. Shadowy ranges were visible as far as the eye could see to the west as well, the little-explored highlands of the east-central Cape, gradually giving way to fynbos and karoo, two of the richest biomes on the earth. All of these ranges are filled with endemic taxa, few of which have ever been studied, even fewer ever grown in a North Temperate garden. How fortunate we are to live in this time of extraordinary horticultural discovery and experimentation.

Drawings by Paul Martin

Panayoti Kelaidis is curator of the Rock Alpine Garden at Denver Botanic Gardens. His travel expenses to Africa in January 1994 were defrayed by a grant from NARGS. He brought back 280 kinds of germplasm, many of which are experiencing their first North Temperate winter this year.

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If you, too, find yourself smitten by the South African bug, you may wish to join the Botanical Society of South Africa. Membership entitles you to a subscription in *Veld & Flora*, a richly illustrated journal with in-depth articles on the botany and growing of South African plants. Many specialty nurseries, bulb firms and seed companies advertise in its pages, some of the best sources for African plants. The magazine has extensive listings of plant books sold at reasonable prices. An immense seed bank is available to members as well.

The Society also supports an ambitious research program at several facilities, world-class herbaria and one of the biggest and best conservation programs in the world today where botanists monitor and research rare populations of plants, and horticulturists maintain and distribute their germplasm. The Society supports a network of great botanic gardens second to none. Membership can be paid by Visa or Mastercard. Current rates should be obtained by writing the Executive Officer, Botanical Society, Kirstenbosch, Claremont 7735 RSA. Tel: (021) 61-5490. Fax: (021)797-2376. —P.K.

South African Sampler

A Dozen Gems for the Rock Garden

by Panayoti Kelaidis

The Mesembryanthemum family occurs in uncanny abundance in every biotic community of South Africa. It is particularly widespread and characteristic of the arid and semi-arid parts of the country, the fabled mountains in the Richtersveld, the Little Karroo, and the colder and vaster Great Karoo. The distributional ranges of a number of genera of ice plants are centered in the eastern portions of the Karoo, extending onto the foothills of the Drakensberg, and in a few cases to the cold tundra on its summit.

Growing as they do in so many different climates in nature, don't expect all mesembs to respond to identical conditions in the garden. Most do quite well with summer watering, and many even seem to need it. Most do well in a mildly acid scree, although many tolerate lime—and *Titanopsis* seems to demand it.

The colder your winters, the more likely these plants are to need dry conditions. A spot below an underhang or a *cloche* might be needed in wet winter regions. Over 50 ice plants in 14 genera have survived one winter in Colorado thus far, and many more show promise of doing so. You can expect a rich palette to test in a few years. A few of the best are detailed below, along with selected potential rock garden gems of other families.

Aloinopsis spathulata (photo, p. 48)

If you have succeeded with either the yellow or purple hardy ice plants (*Delosperma nubigenum* or *D. cooperi*), you may find that quite a palette of ice plants will grow in a sunny pocket of your garden. After proving hardy in Denver in the early 1980s, this extraordinary little plant was the first of its genus to survive a winter outdoors in Colorado, grown by Paul Heiple.

One of the best and quite distinctive is this little pachydermous, clumping mesemb from the coldest portions of the Southwestern Cape around Sutherland. It has survived -25°F for me. The knobby, gray rosettes produce a long succession of tiny pink rose-like flowers during much of the early and middle spring: enchanting! It often blooms the second year from seed and forms a horny mass of vegetative succulence in a few years with a large trunk root. Alpine purists have been known to swoon at the thought of ice plants in

rock gardens, but everyone who sees this loves it.

Subsequently, every species of *Aloinopsis* I've tried, except *A. rubrolineata*, has survived at least one winter outdoors in Denver. *Aloinopsis peersii* and the similar *A. thudichumii* seem to be particularly tough. With velvety smooth leaves of a pearly grayness that contrast nicely with their lemon- or orange-colored blooms.

Chasmatophyllum musculinum

I only know a handful of rock garden plants that bloom for more than a month or two; this tiny high mountain succulent from South Africa blooms longer and better than any. Most years the first flower opens in late April, and there are usually a few blooms hanging on into October. The neat, jagged-leaved clumps of dark green succulence are spangled every evening with 1" ragged stars that are rich golden-yellow on the inside, neatly striped red-and-orange on the reverse. The flowers open in the late afternoon and close again at night, so they are best enjoyed around dinnertime, drink in hand. It seems just as hardy, or even hardier than its *Delosperma* cousins, thriving in loam as well as scree.

Delosperma sphalmanthoides

Every red-blooded rock gardener imagines growing a plant new to science. I hate to break the news to you—most of the time you don't even realize you've done it. I assumed this little mound of quill-like leaves was just a *Sphalmanthus*. It looked just like the *Sphalmanthus resurgens* I had grown for years. Except, of course, the flowers on the plants sent me by John Lavranos were deep rose-pink. So it was a pink *Sphalmanthus*. By the time Steve Hammer of Mesa Gardens finished with it, not only was this not *Sphalmanthus*, it was new to science. Surely the most appealing and tiniest of delospermas, this is the perfect trough plant or specimen for your choicest scree. Out of bloom it looks like a huddled *Talinum breviflorum*. In early spring the little blue fingertip leaves are obscured with many-petalled, shimmering pink flowers over 1" across.

Rabiea albipuncta

Fewer than a half dozen species in this genus, which is largely restricted to the eastern half of Great Karoo, a semi-arid steppe characterized by sparse summer rainfall. The general weather patterns are remarkably similar to the plains of Colorado—or perhaps more accurately, the staked plains of the Texas Panhandle. Although winter temperatures rarely drop anywhere near 0°F, most succulents from thence adapt quite readily to fierce Colorado winters. This *Rabiea* has been grown in a variety of gardens in Denver for the last four years, forming very chubby clumps of wedge-shaped leaves. The flowers are simply miraculous—hot yellow badminton birdies 3" across when fully open, fading to burnt orange. They begin to bloom in February some years, blooming on and off as late as May. On days when several flowers are open simultaneously on several plants in a colony visitors really stop and gasp. The rest of the calendar year the deep purple stained rosettes are beautiful in their own right. Of the 20 or so plants I put out four years ago none hase perished despite winters that have tested our native plants and crippled or killed most of the Siberian elms in Denver.

Ruschia putterillii

I received my first starts of this plant from the famous Greek plant collector John Lavranos. Maybe because of John, or the strange, shrubby habit of the plant, or its amazing reflexed flowers, I treasured this gem a little too greedily. There is something ludicrous about a plant that is both shrubby and succulent. The very first year its arching stems formed a dense tangle. The remarkable flowers, like upturned shooting stars, were shimmering amethyst purple. I guarded the plant selfishly imagining how I would dazzle the rock garden world with this delightful novelty. Mind you, this isn't really my style. I usually propagate plants like crazy and share them with everyone. In my fit of gloating I neglected to take cuttings of my sole specimen. The winter of 1990 was disastrously cold, and my solitary plant perished in its precarious crevice. For two years I mourned its loss.

In the fall of 1992 I visited Bob Bartolomei at New York Botanical Garden. There, on a bank, I saw a mass planting of a shrubby mesemb. I quietly ignored the hallucination, but again in his alpine house there they were, several pots of husky and undeniably happy *Ruschia putterillii*. "Where did you get these, Bob?" "Don't you remember when I visited you a few years ago? You told me to help myself to cuttings."

Wouldn't you know Bob would have picked out the ruschia? "Of course you can take a pot home. The plant propagates like a schmoo." Bob described how when grown in the greenhouse plants can look like unkempt hair. NYBG grew used masses of it as headdresses on scarecrows for some event. No doubt the wigs were discarded afterwards even as I was yearning for my little plant.

Last January I admired dense tufts of *Ruschia putterillii* on rocky hillsides from the Platberg in the north to near Naude's Nek in the south, a range of several hundred miles. Is it any wonder this is generating excitement?

Titanopsis calcarea

Any fancier of succulents can tell you *Titanopsis* is a remarkable mimic. It so closely resembles certain kinds of limestone that it was discovered when a botanist sat on it by mistake. Its resilient, rubbery rosettes might have mass market value if they were marketed as mutant ninja pebbles! I never dreamed that hardy forms of this striking plant existed until I conducted a wholesale test of a broad range of succulents several years ago. The strain of *Titanopsis calcarea* originating near the Kimberley Diamond mines has been the toughest race, surviving the coldest winters in recent memory. The translucent, daisy-like blooms of lemonade and amber color come at intervals all summer and autumn. Here is a rock plant in every sense of the word!

Helichrysum

In Eurasia, helichrysums are plants of relatively hot, dry sites. In South Africa this genus is so widely distributed that generalization is meaningless. The Drakensberg Mountains are likely the center of diversity for the genus, and helichrysums from these mountains demand cooler and moister conditions. In Colorado South African helichrysums are best grown on granite scree or even in peat beds. We have had six species overwinter with no damage over the last ten years. *Helichrysum* was a major inspiration for exploring South Africa: there are dozens of choice, un-introduced species that bloom throughout the growing season. Anyone seeking to make their rock garden attractive

in the summer will come to love this genus. I predict that it will soon assume a place in the rock garden pantheon alongside saxifrages and gentians.

Helichrysum bellum (photo, p. 37)

This species is widespread at higher altitudes throughout the Drakensberg. I have grown from several sources in recent years, and the plants vary from 5" tall to nearly a foot. The leaves are sparsely hairy, deep blue-green, and prominently veined, forming lax rosettes. A single plant can form a mat a foot or more wide with dozens of flower stems . The papery flowers are an inch or so wide. They open in late June, looking fresh for much of the summer. Needless to say, this is a welcome time for showy bloom.

Helichrysum sessiloides (photo, p. 37)

A dramatic contrast to the last species, this is a tiny cushion plant that grows on cliffs at the highest elevations throughout the Drakensberg. The white, paper-flower clusters are produced in midspring and remains in peak form for several weeks. It has grown quickly from seed and easily from cuttings. The flowers close at night, and the appearance of the plant is then so different that it is quite intriguing to watch. This *bona fide* alpine deserves to grow alongside the fussiest androsaces and snooty primroses.

Helichrysum trilineatum

Lest you think every helichrysum is compact and herbaceous, let me tell you that there are a few giants. The first shrubby species we grew at Denver Botanic Gardens is this one, and it remains one of the most gratifying dwarf shrubs I have ever grown. Knowledgeable visitors assume that young specimens of this species are *Santolina*. However, the *Helichrysum* tolerates more shade and moisture than any lavender cotton. It can grow to a yard or more in height and even wider, although it takes a number of years to do so. The yellow, button-like heads produced in early summer are decorative for many weeks.

This has been lumped with *Helichrysum splendidum* in the *Plant Finder*, and the other publications, and the two species are similar. Both are also very variable. There is no mistaking the difference in the wild, and I think both species deserve a place in most gardens. *Helichrysum splendidum* has longer leaves and much larger, showier heads of bloom.

Compact alpine races of both species are found in the Drakensberg. There are never enough hardy, evergreen shrubs; these are shimmering ever-silver.

Hirpicium armerioides

Not many rock gardeners worry over the prospect of hardy gazanias. I have been rather surprised to find myself with not one, but two species that have made it through our toughest winter. *Gazania krebsiana* looks enough like common bedding gazanias (selections of *Gazania sinuata*) that purists may sputter and hyperventilate a bit, but I doubt that anyone would fault *Hircipium*. It has made itself quite at home over the last 10 years. This is a true alpine from the high Drakensberg. It makes a mop of hispid, deep green leaves 2 to 3" deep and up to a foot across in a few years. The flowers are typical, trim, white gazanias with a black stripe on the back of the ray flowers. Since it closes its blossoms every night, this is a noteworthy feature. Flower heads are produced in a constant succession from late spring all the way through October this year. *Hirpicium armerioides* seems to do best in a well drained, slightly peaty

soil out of the hottest sun: not all South Africans are desert plants by any means.

I saw this *Hircipium* growing on gravelly ridges on Blue Mountain Pass in Lesotho alongside the brilliant blue *Selago sandersonii* and a welter of *Erica* spp. It made compact mats with leaves only an inch or so long and nearly stemless flowers.

A hundred miles or so to the north, it formed a husky perennial with leaves 3-4" long and flowers on stems 5" tall. In the Eastern Cape, it grew on cliffs with *Euphorbia clavarioides* and a number of delospermas. This is truly a versatile plant in nature, and presumably in the garden.

Moraea huttonii

For many years now a tall, yellow-flowered iris look-alike has been making the rounds of iris enthusiasts throughout the United States. Superficially, it looks like a bright yellow Siberian iris, but each flower persists only a day, and the long, fibrous-based leaves splay so widely and manage somehow to be quite evergreen, indicating that this is no simple iris.

Indeed, it's not an iris at all. This is simply the first *Moraea* most of us have encountered. There are dozens of brilliant *Moraea* species in the Western Cape that demand dry summers and mild winters. The brilliant East Cape species, however, like rich loam and regular moisture. For years, if a *Moraea* bloomed yellow and came from the Eastern Cape, it was called *Moraea spathulata.* Over the last two decades Peter Goldblatt of the Missouri Botanical Gardens has examined this endlessly variable genus and determined that many distinct species have been obscured under this catchall name. His brilliant monograph of the genus makes a fine companion to Dyke's *Genus Iris.*

Most yellow moraeas currently in cultivation are probably *M. huttonii,* a high altitude species with even more brilliant coloring than the more widespread *M. spathulata.*

Several dozen moraeas occur at lofty altitudes in the Drakensberg, and dozens more occur in other high ranges throughout South Africa. If you were intimidated by northern irises you may balk at another large genus of irid. But once again, *Moraea* has a shimmering, evanescent beauty distinct from *Iris.* And so many moraeas often bloom much later in the season.

Moraea polystachya

In October 1994, I was touring a wonderful city garden in Raleigh, North Carolina. Autumn had already tinged many trees bright scarlet and yellow, and garden flowers were sparse, but in this garden a *Moraea* sported a dozen crisp flowers of bright blue, yellow, and white. It was *Moraea polystachya,* a relatively low-elevation species from the Karoo, bearing a combination of colors seen elsewhere only on *Iris cycloglossa* and the Colorado columbine, two of my favorite flowers. But in October? As it turns out, this blooms in autumn in nature as well.

A sizeable percentage of the 25,000 species of plants known for South Africa grow where frost is frequent and summers are warm. Many seem to be more adaptable than our native wild flowers. This is surely the last, great haven of showy rock garden plants for North Temperate gardens.

THE VOLE STORY

by Helen Sykes

For some years prior to the dreadful spring of 1991, I had rejoiced in the fact that despite numbers of fairly superficial burrows in my garden, there was never any damage done to my plants. In fact, I joked that delphiniums must like root pruning, because although every plant was encircled at about a 6" radius by tunnels, each still flowered magnificently. That fateful year, however, of 400 *Tulipa greigii* and other species tulips which I had planted in groups along our 150' road frontage, only a few poor remnants came up, and each day, some of the remainder would wilt and die. After a few days, when it was evident that they weren't going to recover, I gave them a tug, and they came right up. Chewed off at the base! In horror my husband and I decided to dig where the bulbs should have been, and there, all along the bed, with side tunnels branching along the back into my lilies was a Rodent Runway! We dug up a couple of the lilies that were right in the path of the tunnels: the beautiful, big, healthy bulbs were gnawed away at the tips like so much asparagus! Woe! Woe! Until this point I had been perfectly prepared to live and let live, but these rodents—whatever they were; we had no idea—had gone too far!

Of course this tale of woe caused all sorts of people to suggest possible culprits: moles, voles, chipmunks, squirrels—and their pet possible remedies: chewing gum, cat litter, marigolds, *Euphorbia*, cats, dogs...Everyone kept telling me we should get another cat (the previous one had come to a sticky end). I kept telling them that with my luck, no cat I acquired would have the slightest inclination to hunt. It would consider itself a Superior Feline and want to lie on a cushion all day and drink cream.

From the nature of the tunnels, and the articles we kept reading which said that moles, at least in this part of the country, do not eat plants, only earthworms and grubs, we concluded that our tunneler was a vole—or rather a whole colony of them.

We decided to line at least the precious lily beds with wire mesh, but suitable wire proved hard to find or too expensive, so in the meantime we experimented with traps of various descriptions, running the car exhaust into the hole, and even finally putting

poison in the holes, all with a singular lack of success.

For several years the plague worsened and spread into all the other beds in the garden. Each year we dug a few areas and lined them with wire (we finally found a source) and later with plastic mesh (much cheaper and it also works). We spent a small fortune on traps of various kinds. Each time we read an article about moles or gophers, we'd follow the recommendations in the hope that the technique might work for voles as well, but we never caught a thing. Few people but the gardeners around here seem even to have heard of voles, but finally after a couple of years I found a dead one, killed by the neighbor's cat, so I knew they really existed.

Eight 100' rolls of wire and mesh later, we had resigned ourselves to several years of digging up the garden until it was totally enclosed, when possible salvation was extended to us. Leo Blanchette, of Carlisle, Massachusetts, who has a wonderful nursery and a simply beautiful garden with innumerable hostas where he has had to keep up a running fight against voles for many years, told us how he was succeeding in trapping them. The method is very simple. Use an ordinary mousetrap, baited with peanut butter, placed right next to a hole. We had tried this before, but although the traps were always sprung and the peanut butter gone, we never caught anything and gave up in disgust after a couple of weeks. The secret, Leo assured us, was just to cover both hole and trap with an upturned flower pot! His theory was that the vole, on coming up, would find itself still in the dark and would therefore believe it was still safe underground and feel secure enough to investigate the trap. In addition, the trap would be hidden from all the other garden denizens .

Somewhat skeptical, we decided we had nothing to lose by trying this method. We set up four traps, duly covered with large plastic pots, and waited. Nothing on the first day, nothing on the second, third, or fourth. I gave up, but my husband said he would persevere for a week. Next day—success! Two dead voles! Rejoicing, we rebaited and waited. Nothing the next day, then another two voles, followed by five days with no results. "Is this all there were?" we wondered. And then a couple voles every second day for the next six days. This was the end of August. At this point, my husband bought another ten traps, and business picked up rapidly. Over the next eight weeks, with my husband religiously doing a vole patrol every other evening, we trapped a total of 72 voles, with the number falling off sharply as the weather cooled down a little in November. Some traps never caught any animals, others caught only one or two; others caught 10-15. We told our friends about it, and one couple just reported back that they have tried it, and it works for them, too. They have caught 17 animals in about three weeks. We are still catching the odd one now, in mid-December, and our total is 88. (Leo tells me that autumn seems to be the best time for trapping, so if you fail in the spring or summer, try again in the fall. We caught about 30 in September, and in both October and November—although this year, November was unseasonably warm.)

We did have a problem at one stage with some animal amusing itself by going round the garden, knocking over every pot and devouring the bait. But we soon fixed that: we put a big rock on top of every pot but two and placed rat traps in those pots. We assume whatever it was got its nose soundly rapped, since one rat trap was

sprung, and we've had no such trouble since. We also found that some kinds of ants are attracted to the peanut butter, but they don't seem to bother the voles. You just have to replace the bait if the ants eat it all up, which takes them a while. It is interesting to me that even in the most active locations, we seldom caught more than one vole every second day. My theory is that since my husband refuses to bother with gloves when setting the traps, his human scent takes a day or so to dissipate. Also, he doesn't bother to wash the traps after they are sprung, and although most of the time it is a fairly bloodless procedure, sometimes there is a little blood. It does not deter other voles from coming to the same trap.

The great thing about this method is that you can really see that it works. All the other mythical remedies simply leave you to imagine whether or not there is less activity. The number of plants being eaten fluctuates greatly from month to month, so it would be easy to delude yourself that the marigolds/bubblegum/etc., had worked. I can say with certainty that protecting tulips by planting them between bulbs that the voles don't eat is a myth. I used *Fritillaria imperialis*, whose bulbs positively stink, and although the voles didn't eat them, the rodents showed no qualms about tunneling within inches of them and devouring the tulips with apparently undiminished relish.

There is some controversy about whether what we are catching are actually voles or juvenile moles. Juvenile moles do not have the typical very large flipper-type mole feet, just strong-looking but small, mousey feet. I consulted Roger Swain, science editor of Horticulture magazine, who was in favor of the vole theory. Moles are reportedly insectivores and would a) be unlikely to be attracted to peanut butter, and b) be unlikely to occur in such large numbers, since it reportedly requires a third to half an acre to support each individual. My lot is just over an acre in size. However, voles are described as reddish-brown in color, and a picture of the pine vole that I found in a handbook on mammals shows it with small but visible eyes and ears, while our little corpses have no ears and only pinprick-sized marks for eyes, and are gray, not brown. Leo says he catches both moles and voles, and even, unfortunately, shrews.

In any case, I am happy to be reducing the tunneling population. I have just one remaining question: I would like to know what sort of total population to expect. If we are talking about thousands, the catch so far is only a drop in the bucket. But if there were only 90, then we are almost done! In any case, Leo, thank you. We finally can do something about this problem.

Drawing by Jack Lambert.

Helen Sykes gardens in Sudbury, Massachussetts.

Pine mouse, mole mouse. *Pitymys pinetorum*

PLANT PORTRAIT

Aquilegia scopulorum

1988

It was hot; it was Utah in July. We drove up a lonely dirt road, up almost imperceptibly onto the immense Aquarius Plateau. A rose loaded with glorious bright red hips edged the road in places. Meadows rampant with wildflowers gave way to steep slopes heavily wooded with *Pinus ponderosa, Pseudotsuga menziesii, Picea englemannii.* Huge fallen trees were mixed with standing giants, some with broken tops bearing evidence of the violence of the weather in this state so sparsely inhabited, so wild, so primeval in its vast expanses of rock, the bones of the earth laid bare to examination by all and any. In many places the forest was broken by rock slides, with a few young strapping saplings, a few seedlings indicating soil slowly being deposited among the broken chunks of rock. Here and there were briars and brambles of some unknown raspberry. There was *Linum kingii* scattered under the trees. A sprinkling of pale white columbine, the pallid version of *Aquilegia caerulea,* dotted the shadows under the trees like some large languid moths floating in the unstirring air. Above the trees we could see in places scree of a pale apricot rock, and finally we stopped and climbed up. The scree was of particles both quite fine and as large as an inch in diameter. The surface was stuck together like concrete by all the fine clay of the disintegrating rock. It was almost impossible to stand on the slope, it was so steep. There was no chance to dig in my heels, although deer had clearly crossed the slope, managing to dig in with their sharp hooves.

But the sought-for *Aquilegia scopulorum* was there on that tilting horizon, blooming unabashedly so late into the summer. The flowers were lovely with long spurs and pure blue flowers. I bent to wonder, thrill, examine, photograph. And I could hardly stand up, afraid of overbalancing, losing my footing, sliding down that steep slope of sharp, pebbly pavement where no foothold was possible. At last I managed it, using all fours, pushing my toes into the holes made by deer hooves. I crept down the slope, seeking out each clump of flowers. Two hundred plants in late flower? Perhaps fifteen seed capsules, most not ripe. The rest were eaten, the chewed-off stems sticking up vainly into the air—by those deer who had abetted my descent? or perhaps by some squirrel of that dark forest. Back on the road grade, we gazed upward, wondering at our coexistence with that *Aquilegia,* inhabitant of great steep places in this world.

1990

On a peak called Bunker Hill in the Toiyabe Range of Nevada, we found *Aquilegia scopulorum* in blue and white, blue and blue, and pink and white. This population is reached from a valley forest of 12' *Cercocarpus ledifolius,* by walking up a dry stream bed that suddenly comes alive, then leads on into a canyon

blocked by shale on a 65° angle. We scrambled up over the shoulder, I hanging on by my fingernails, toenails, and teeth. We'd gone a little too far into the canyon before realizing we were boxed in. The shale was shattered into blocks about 12" by 18", which broke loose and slithered towards me on the layer of rock below if I put too much weight on them. After climbing cross-country (cross-mountain), rising almost a mile in a mile, we came at last, exhausted, onto a vast scree, with *Polemonium*, an *Astragalus* with fat, painted pods, the ubiquitous *Hymenoxys acaulis*, and an occasional inconspicuous *Aquilegia scopulorum*. The scree was so steep, precarious, and so actively shifting that some of the huge flowers were buried under the scree rocks, unable to lift themselves as they opened. Tufts of the blue-green leaves, larger than those of *Aquilegia jonesii*, but truly just as desirable, were scattered in loose groups here and there. Some of the flower stalks were eaten off; not one of the seed capsules was ripe. As much as we wanted seed from that population, we had the distinct sensation that we might never return to that spot.

Happy to have visited another haunt of the great *Aquilegia*, we followed the ridge across, through bright lupines and rosy *Castilleja*, down to the steep, sage hills above the car. Our two-year-old daughter Eleni and Jeanne Anderson had stayed below, to be visited by a large herd of sheep as scared of Eleni as she was of them. The hike took us over five hours.

Aquilegia scopulorum is, in my opinion, a definite candidate for home cultivation, complete with hand pollination. Wild seed may be desirable, but it is essentially unobtainable. This particular *Aquilegia* grows in inaccessible spots! and seems seldom to bear seed unpredated. The deer populations of the Southwest are no longer limited by wolves, bears, but only the occasional mountain lion.

We had two other substantial thrills on this trek through Nevada; one was finding *Phlox tumulosa* fat with seed, perhaps 100 on one plant; the other was a beautiful double rainbow in the pink sky of dawn, framing the peaks of the Ruby Mountains as we peered from our tent into a highly unusual morning drizzle. We have never before experienced so much rain and so many clouds in the Great Basin.

1992

In the autumn of 1991 I planted the seed pot of those few seedlings that germinated from the Aquarius Plateau *Aquilegia scopulorum*. There hadn't been many seeds, and even those were questionably ripe. There were only three plants, so I simply pulled them apart and set them just below the ridge line of my newly constructed double cirque. Would this slope be steep enough slope to satisfy these wild creatures?

For now, it seems it is. This spring a whole crop of new seedlings germinated around the larger plants where the soil of the pot had remained undisturbed. Three plants bloomed. The one that bore the best blue flowers had shaggy foliage; one remained scrawny and bore only perhaps 10 flowers throughout the summer, while the third produced a dense bouquet of crisp, silvery blue leaves worthy of cultivation for themselves alone. Then arose a great mass of flower stems, the buds lifting from below the foliage, unfurling like some overfed but contented cyclamen from the florist trade. That one plant bore, by my count, 89 flowers and flower buds on a single, singular day in May. I covered it with chicken wire, as English sparrows and house finches had torn apart buds of the

first plant to bloom. Every flower, after hand pollination on a daily basis crossing the three plants, bore a seed capsule. The plants rebloomed in the fall. By the end of the season, I had collected over 5,000 seed. I hadn't crawled across any unstable slopes of moving stone, fearing for my life and limbs.

But I do remember where this plant comes from. It will always be evocative for me of raw mountain tops and impossible slopes, of places wild and uninhabitable by any other than this fearless blue columbine with its head tossed back, its spurs moving ever so slightly in the ever-present breeze.

1994

Spring came after a hard-frozen winter. The *Aquilegia* plants were clearly alive, though not, perhaps, thriving. The leaves were fewer, the growth somehow less husky. I had that sad, vulnerable feeling that comes to me now when I hear the frail voice of a beloved and aging aunt answering the phone. Yet perhaps there would be another vigorous season. Perhaps I was judging too soon. Flower buds began to form, not as many as in that glorious first year of bloom, but more might follow later.

The amazing display was not to be. One night in late April brought a severe frost, and the buds were lost. The plants continued to look sorry all season. Were they damaged themselves by the frost? It is hard to believe that a cold snap could matter. This species must suffer frost in its native haunts, too. Perhaps the soil is too moist for good survival., Perhaps it is too wet. Perhaps columbines are just naturally short-lived.

In any case, save your seed if you are growing a pure-bred of this species. Grow new ones each year, be cautious, be greedy. No alpine has been more rewarding, none more inspirational to me. And I am called to find this magnificent plant in nature again in the coming summer. I'm not sure where, but I will be balancing on some scree somewhere in the Southwest this Julyhoping for a glimpse of those graceful blue flowers.

—Gwen Kelaidis

BOOKS

A Gardener Obsessed: Observations, Reflections, and Advice for Other Dedicated Gardeners, by Geoffrey B. Charlesworth. 1994. David Godine:Boston. 243 pp. $24.95. ISBN I-56792-002-0. NARGS Bookstore, $20.

Someone before me has said that if you are a writer and a gardener you will eventually write about gardening. It is equally true that if you are a reader and a gardener you will eventually read about gardening. A "reading gardener," however, is not one who merely consults *Hortus III* or a favorite garden encyclopedia or the definitive tome on a particular species. A reading gardener reads about gardens and gardening as much for pleasure as for information, although information may abound. Such readers happily spend an evening with Vita Sackville-West or Eleanor Perenyi or Elizabeth Lawrence or Henry Mitchell or Roger Swain, or they may search out such lively columnists as Ann Raver in *The New York Times* or Patti Hagan in *The Wall Street Journal* or subscribe to such newsletters as Alan Lacy's *Home Ground.* To varying degrees all these writers offer advice, or, if you will, "how-tos." But their "how-tos" are often not the heart of the matter. One reads them to indulge in a favorite subject, for the chance to converse one-sidedly with a knowledgeable gardening friend, as well as for the diversion offered by the author's mind, manner, and matter.

For all these reasons one reads Geoffrey Charlesworth, who is right up there with the best of the luminaries cited above. Everyone reading these pages knows Charlesworth is a passionate rock gardener and eminent member of NARGS, a co-founder of the Berkshire Chapter and former Chair of the Connecticut and Berkshire Chapters, and they may also be aware that a few years ago he won the Carlton Worth Award for distinguished writing on rock gardening. But not everyone knows that he is a born writer, although if they have been attentive readers of the ARGS *Bulletin* or the Newsletter of the Berkshire Chapter they have already had the chance to enjoy some of the essays now published in hard cover in *A Gardener Obsessed.*

In addition to being a born writer, Charlesworth is a natural-born obsessor, list-maker, categorizer, and organizer. Perhaps this accounts for his past career in mathematics, or maybe it's the other way around, a side-effect to be expected of the holder of a doctorate in math. No matter. Once I am induced to overcome—only to a small degree—feelings of base inferiority brought on by awareness of my erratic, half-baked record keeping, spasmodic and unsystematic seed starting, not to speak of haphazard seed collecting degraded further by an inability to remember most correct botanical appellations for more than a few minutes at a time; I am able to stifle my self-consciousness about my many demerits as a gardener sufficiently to experience the pleasures of reading Charlesworth. A gracefully turned phrase or a laugh-out-loud bit of doggerel make *A Gardener Obsessesd* a singular page-turner and a fitting sequel to *The Opinionated Gardener.*

Like you, I may even learn something I need to be taught on my uneven road to gardening proficiency. For although Charlesworth asserts that this is not a book on

the technical aspects of gardening (e.g., names and origins, design and history), it contains a strong core of advice to the garden-lorn from a self-effacing voice of experience. My favorite chapters in this category (many first published in the Berkshire Newsletter) are "A Plant List: the First Hundred,", its follow-up, "Postscript: Aftercare," and "Which Gentians Should I Grow?" You, of course, may prefer "Rocks in a Rock Garden," which assures us we do not absolutely need to have a single one, although the author has been digging up and pushing around some of the same boulders for years. Or, if you are battered enough, you might like best "Gardening in Old Age." Or perhaps you'll pick "An Ideal Day," because your thoughts on the matter are so similar.

The plant list suggesting the first 100 "easy" plants for a rock gardener is worth the price of the book. I intend to photocopy it and carry it in my pocket whenever I stop into a promising nursery and to keep it handy when I drool through the next rock garden catalog or strain my eyes over the upcoming NARGS Seed List. Soon, instead of having a rock garden that includes lots of dross and only a handful of the beauties recommended, I'll be able to gaze on most of them. Naturally, I hope I'll know their botanically correct first, second, and even third names, that they'll be labeled and entered in a notebook and computer list, and that some of them will be in glorious bloom from April to October. I'll send Geoffrey a thank-you note—though really, I owe him one already.

—Cecile Shapiro

Sedum: Cultivated Stonecrops, by Ray Stephenson. 1994. Timber Press, Inc.: Portland, Oregon. Hard cover, 356 pp., 110 color, 100 black-and-white photographs, line drawings. ISBN 0-88192-238-2. Price, $49.95. NARGS Bookstore, $40 plus postage.

For any gardener who wants to learn more about this attractive and versatile group of plants, this is simply the finest book available. Attractively presented, interestingly written, and containing just about everything known today about sedums for the garden, Ray Stephenson's new work can be highly recommended. The author is not only an enthusiastic gardener and a prolific writer but also chairman of the international Sedum Society and editor of its *Newsletter*. His own garden and greenhouses in Northumberland, England, contain some 800 different sedums and related plants, and are designated as the National Collection of *Sedum*.

In the opinion of sedum fanciers, there are too few books about sedums, although these plants have been known since antiquity. Modern studies began with Lloyd Praeger's exemplary work in 1921. Alwin Berger's useful classification of 1930 can be found embedded in Hermann Jacobsen's *Lexicon* (1970). A major taxonomic essay by Harald Fröderstrom with many photographs of dried herbarium specimens was completed in 1935. Apparently this represents the last time any taxonomist had the temerity to confront the entire unruly genus. Robert Clausen wrote books on Mexican (1959) and North American (1975) species. Henk 't Hart has done extensive work on the Old World species. H. Ohba covered Japanese taxa. Reid Moran and Jorge Meyrán have been reporting new species. Urs Eggli wrote about the genus *Rosularia* and Charles Uhl's extensive work on the chromosomes of the Crassulaceae family shed new light on the taxonomy of sedums. Ronald L. Evans published his *Handbook of Cultivated Sedums* in 1983. It quickly sold out; none of the previous books on sedums is readily available today. Stephenson's excellent new volume thus fills a real need.

Stephenson begins by discussing growing sedums, a detailed account which could have been written only by someone with many years of practical experience. He describes various parts of the plants with clear and helpful line drawings. The book then discusses the separation of the genus *Sedum* from its cohorts in the Crassulaceae, thereby illustrating the old taxonomic maxim that when it is easy to differentiate a major group, you can expect trouble in dividing it into subordinate groups. The second and major part of the book contains detailed descriptions of some 400 species and varieties with many drawings and color plates. Based on recent research, Stephenson's classification scheme leans towards "lumping" rather than "splitting," which are the Scylla and Charybdis of taxonomy.

We are condemned to pursue perfection without attaining it, and even this fine book is not without its deficiencies. For example, the color plates are generally of adequate quality, but some problems of color values are evident, particularly in Plates 19, 23, and 24. On Plate 69, contrary to the label, only the 'Aurora' form of *S.* x *rubrotinctum* is shown. Plate 52 unfortunately does not show the dainty yellow flowers of *S. nuttallianum*, which, by the way, are a knockout when placed near the delicate blue flowers of the other rock garden annual, *S. caeruleum*. . A number of species and cultivars grown in the US are omitted, and Stephenson's descriptions of individual species are not always balanced. For example, *S. confusum*, an attractive semihardy species, is listed but not described. The deservedly popular plant described by Evans (p. 194, Plate 9) under the name *S. weinbergii* is barely mentioned by Stephenson. I have long felt that the name *S. oppositifolium* (p. 142) is preferable to *S. spurium* 'Album'. If differences in flower color, leaf attachment and leaf shape are not enough to justify specific status, what are? Stephenson tells us (p. 26) that only *S. reflexum* is reported to have been used as food, but Sturtevant's Edible Plants of the World also lists *S. album, S. anacampseros, S. rosea*, and *S. telephium* as being eaten. I can personally attest that their lack of popularity as food is well deserved.

An error on p. 152 deserves explanation. There is no *S. kamtschaticum* 'Takahira Dake'. It is merely an invalid name for *S. k.* 'Tekari Daki'. I know this because I was responsible for the mistake, which I have been trying to correct for years. About 1977 I received a specimen under the correct name from Helen Payne, author of the delightful *Plant Jewels of the High Country* (1972) and owner of Oakhill Gardens. Some years later, I was told by a professor of Japanese that *dake* meant island, but that *tekari* is not a Japanese word and was probably erroneous for *takahira*, which means high-level-mountain. I wrote to Ron Evans, who then included that name in his book (p. 123, Plate 4). Later, I was informed that while "tekari" is indeed not a Japanese word, it is a known place name in the Ainu language and that 'Tekari Daki' is valid. I wrote to Evans but his book had already gone to press. My error has joined the many other misnomers for sedums.

In the preface, a British horticulturist remarks: "This book attempts to bring up-to-date, as much as possible, the present trends in the nomenclature of *Sedum*, a very complex genus...It is inevitable that people will debate forever the validity of plant names in the present volume." Well, perhaps. Most gardeners would be satisfied if they had only generally acceptable name for each distinctive garden plant, regardless of the minutiae of whether it represents a true species, a subspecies, a variety, a cultivar or a form. Stephenson remarks that "Most general nurseries use incorrect names for *Sedum* species..." In writing this book, his earnest hope, he avers, was "to make the identification of over 400 stonecrops as reliable as possible." He has succeeded admirably in accomplishing this goal. —David Heller

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