

THE ROCK GARDEN



THE JOURNAL OF THE SCOTTISH ROCK GARDEN CLUB

Volume XXIII Part 3 Number 92

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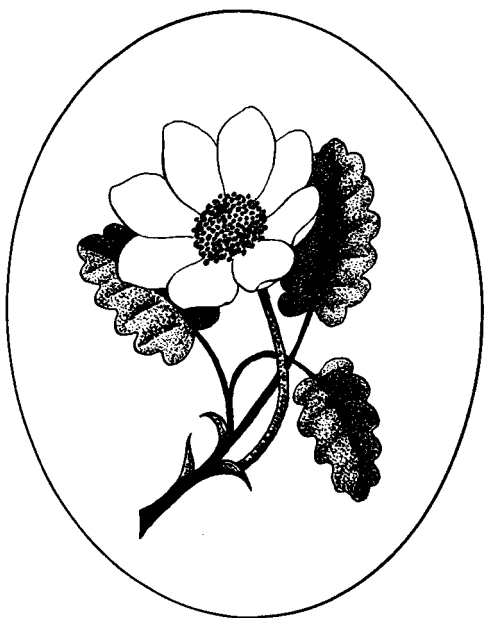
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Front cover: *Lilium monadelphum*, above Itkol, Balkaria, Causasus. Michael Almond

Back cover: *Lilium monadelphum*, Megev, Dagestan, Caucasus. Lynn Almond

THE ROCK GARDEN

The Editors would greatly welcome contributions to **The Rock Garden** on any aspects of alpine and rock garden plants and their cultivation. Articles should follow the format of previous journals, with colour slides and line drawings if appropriate. They should preferably be typed, double spaced, or on a 5.25" floppy disk in Microsoft Word.

Pen and ink drawings and vignettes are also welcome, especially in a horizontal format to fit a part page. Articles and drawings should be sent to the Editors.

We also require cover photographs for **The Rock Garden**. Anyone with colour slides for consideration as cover plates should contact the Editors. An article to accompany the cover plate pictures is strongly preferred.

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Fritillaria pudica

Edith Clark

Editorial

We're writing this at the end of May, when we should be in the garden doing all those things that are crying out to be done; the weeding is waiting, the pricking out from the hundred or so pots of seedlings (some still there from last year, the shame of it), and the finishing of the tasks from last winter, like the autumn tidying. Nevertheless, we're enthused with our gardening at the moment. Why, you might ask? The reason is we've hardly been in the garden for the last two months of weekends.

Now, this might seem perverse, perhaps along the lines of "absence makes the heart grow fonder" or something, and maybe it is. We've been around all the shows, and have been struck by the sheer quality of plants this year, especially from many of the newer growers, who are consistently putting your editors to shame with some superb plants. The special Jubilee Classes for small six pans have been extremely well supported, with up to seven entries in competition for the vignettes by Duncan Lowe, and one or two walls are now sporting a collection of these classy little prizes. The classes have proved to have so much appeal that they may return next year, in response, as they say, to popular request. We would certainly welcome this, as many folk have great little plants that they may be reluctant to show against the great big plants that usually adorn the benches in the "six-pan".

Second, we've just returned from the Diamond Jubilee Weekend in Oban. It's been wonderful to visit lots of gardens, in a sunny weekend, with great company, and benefit from the seamless organisation of Hilary Hill and the Lorn Group, to whom much credit: thank you all. Visiting other gardens always gives one food for thought: but how can we create the sort of rock outcrops and natural water features that abound out west? Carole now wants to dig up all our lawn to find the rock below, to emulate Hilary's amazing rock feature, and we've got wonderful memories of the biggest *Rhododendron yakushimanum* in the world, superb candelabra primulas and azaleas, new ideas for screes and much much more. Enough said, we're off into the garden! Enjoy the rest of the Jubilee Year, visit some gardens yourself, and take some new ideas home with you.

Carole and Ian Bainbridge

THE STONE COLUMN



Grasping the Nettle – Category NWTS

No garden, regardless of its area can ever be elastic; there must come a time when all the available planting space is occupied, and redevelopment is the only way to accommodate new plants. Happily we still have a long way to go before all our land is under cultivation, but as the garden enters its third decade remaking will inevitably take up more and more of our time. I am not greatly enamoured of those planting schemes where the emphasis is placed on individual specimens each separated from its neighbours by carefully weeded bare ground, but neither do I advocate a free-for-all where only the strongest growing plants survive. The real art in maintaining a naturalistic gardening style lies in balancing growth rates so as to maintain the happy medium between the two above extremes.

Plants which have been in the garden for many years become so familiar that one tends to forget how many of their neighbours have been outgrown, just as old friends' foibles are overlooked. A time comes however when the nettle must be grasped, there can be no further stays of execution for sentimental reasons. Assessment is a much abused term nowadays, but Poll and I are perhaps fortunate in that we can argue the case for and against before passing judgement. Two sentences are possible, for those plants convicted of being NWTS, 'Not Worth The Space': complete banishment, or propagate and a new start, usually in a less choice position. Like most gardeners we can occasionally succumb to the powerful collecting instinct, which leads to the name on the label being more important than the plant itself. We do try very hard however to judge by intrinsic merit whether a plant is worth growing, but ultimately any such decision must be a matter of taste.

Last year, at Poll's insistence, several tatty junipers, a forsythia which hardly ever flowered and some overlarge clumps of sibirica irises had been removed. (Stone Column, Rock Garden 90, p9). I have never been very happy at having to dig out a plant lovingly sited and cared for, but once across my own personal Rubicon, execution became progressively easier. It helps if one starts with a real thug, a plant clearly becoming a menace to all its neighbours. Such was *Diervilla sessilifolia*, whose pinkish young leaves and small yellow flowers in no way compensated for its rampageous habits, suckering up to a metre per year. It is quite impossible to locate and remove every scrap of root, especially amongst other shrubs, but any remaining shoots are treated with systemic weedkiller as they break cover.

The action against the diervilla sealed the fate of two of its neighbours on the ex-larches terrace beds. *Berberis concinna* we had raised from Sikkimese seed, on the recommendation of 'Bean' that it was a pretty little shrub with vivid white undersides to its leaves, but as grown here the three we planted became very dense and congested with dead growths. In a small garden it could be manicured, if you have armoured fingers! The decision on the other flank was much harder to make. *Parrotia persica* was originally planted in the Main Border below the bank, as shade cover for primulas. We did not realise that it would stubbornly refuse to form a leader, and simply spread horizontally. In the early spring of 1980 we spent a whole day moving it to the then new larches terraces, where it continued to expand consuming all rivals save shade tolerant *Daphne pontica* which rose to the challenge, flowering above the spreading tentacles. In recent years it had killed the back half of a sizeable *Rhododendron* x 'Carmen', and was threatening to overwhelm this, and advance across the path leading down to the Stone Column. There were only two choices, regular drastic pruning or complete removal. As it had never flowered and hardly ever colours properly, we chose the latter course. No attempt was made to remove the iron-hard stump, these terraces are full of dead larch roots, the aftermath of the great storm of February 1984 and the subsequent tree-felling. (Rock Garden No. 74, p7).

Another shrub we reluctantly decided had to be cut down was a large *Garrya elliptica* in the Middle Bed beside the dividing dry-stone dyke. Although the grey catkins started to form early each winter, they rarely elongated properly, and the effect was always completely negated by the context of dull brown-seared foliage. Poll has long wanted an extension to the new lily bed as a low raised bed along the north side of the dyke; clearing the way gave us the excuse we needed. A few

metres away in the Middle Bed, a large clump of *Aralia racemosa* was also removed, with some difficulty – the roots rope-like and wide-spreading. According to the “garden-furnishers handbook” it makes a large lawn specimen for connoisseurs of the elegant; but we found the huge mound of compound foliage, little greenish flowers and small spikes of black berries definitely not worth the space. It was replaced by pieces of *Astilbe microphylla* transferred from the Upper Herbaceous Bed, where the latter’s slow spread was out of context. Another discarded herb which had proved too vigorous there was *Mertensia franciscana*, an Arizona native. From a fleshy, deep-diving rootstock its stems rapidly grew to around 0.75m, then flopped in all directions; the rather washed-out blue bells relatively small and inconspicuous on such a vigorous mound of dull grey-green. A form of the related *M. ciliata*, we raised from A.R.G.S. seed collected in Montana, is much better behaved; shorter at 0.5m and sturdier, with more glaucous foliage and brighter blue flowers. The best “border” *Mertensia* we have grown by far is the Japanese *M. pterocarpa*, its elongated heart-shaped leaves a really striking grey, the more open bells relatively larger and a vivid medium blue, reminiscent of those of *Mertensia alpina*.

Down below in the Main Border the campaign against over-large iris clumps continued; a large patch of the original *Iris bulleyana* was completely removed, now we have our own superior form, the territory of a bright purple-flowered *I. chrysographes* hybrid reduced by three-quarters, and replaced by a planting of *Meconopsis regia* x *napaulensis* seedlings, and *I. douglasiana*, which had grown into a hollow circle over 1.5m across, taken up and young pieces replanted elsewhere. We always do our best to rotate our plantings, so that primulas for example go where the totally unrelated meconopsis were previously. Rosette meconopsis we find great soil-improvers.

On the Main Bank nearby, we have a group of shrubs, including two viburnums, the winter-flowering *V. bodnantense*, and the Japanese snowball *V. plicatum*, and also the Siberian bush honeysuckle *Lonicera tartarica*, valuable for the frost resistance of its fresh green young foliage, and copious rich pink flowers. The centrepiece of this planting had been a tall *Sorbaria aitchisonii*, grown for its elegant dark green pinnate leaves, reddish when young, topped in August by white plumes up to 0.4m long. All four are quite vigorous shrubs, and had been jostling each other for many years, so now that extra space is available in the Upper Garden we decided to relieve the pressure by removing the *Sorbaria*. It produces short sucker growths at the base, so several were detached and replanted at the back of the Upper Shrub Border, the main plant at over

3m high, was far too large to move. Further along this border we had replanted a *Kerria japonica pleniflora*, bought in the very early days when our entire gardening library consisted of a single paperback on shrubs, and originally placed beside the back door. As with the *Sorbaria* we had moved offsets 'up top', thinking the green stems would be valuable in winter, although neither of us cares much for the untidy double flowers of brassy yellow. However, released from the North wall it suckered strongly, into *Viburnum plicatum mariesii* on one side and the bushy *Sorbus prattii* on the other. Enough is enough, so out it went, I hope entirely. Any bits missed will soon give themselves away!

It was not only angiosperms which came under rigorous evaluation this Spring, conifers too had their numbers reduced as NWTs. In particular, *Pinus mugo* was found wanting – the typical plant a dark, dead green which reminds me of Victorian shrubberies, like the one I used to play in as a child around my grandparents' home in Derbyshire. We have retained but two, a low spreading seedling given to us by a friend with a small garden, and the slow-growing bun-shaped 'Kissen', which came to us, as a grafted plant, labelled 'Brevifolia'. The cultivar 'Ophir' is supposed to turn yellow in winter, but here it simply looked sick, and so made a one-way trip to the bonfire.

Turning to hedges for a moment, it was a case of one in and one out. We used to have a row of shrubs parked, for want of a better place, alongside the fence in the old orchard. If anyone asked it was a "tapestry hedge", but in reality just an ineffective and rather untidy screen between us and the 'classic willow warbler territory' next door. One of the worst offenders here was *Neillia thibetica*. Bean describes this as a pretty, elegant shrub, while failing to mention that it is a real ramper, capable of suckering up several metres away. The narrowly-cylindrical 10cm racemes, carried terminally, are a flat pink, in no way adequate reward for the 2m height and indefinite spread. With the transformation of this, our last appreciable flat area, into a second frame-yard imminent, the so-called hedge had to go.

Straight across the garden, extending along the boundary past Poll's potting shed, we had planted a 13m run of holly hedge, way back in 1975. I cannot remember why it stopped part-way along, perhaps we just ran out of bird-sown seedlings collected up from around the garden. We had long intended to extend this hedge almost as far as the wicket-gate into the wood on our N.E. side. The ground here is very gravelly, and Poll was able to fork a strip along the fence while the soil elsewhere was too wet to work. Taking out the larger stones dropped the level by at least 10cm, so masses of compost were added. In the intervening

years nature's seed dispersal plan continued operations, and we were able to find a further 16 youngsters mostly 10-15cm high. Even at this size they had developed deep root systems in our light soil, often impossible to extract intact. There is a limit to the disturbance permissible close by a valuable plant. Thus three reserves were potted up to replace any failures. From now on *Ilex aquifolium* will be treated as a weed, just like the many brambles, rowans and berberis deposited around the garden, by flying alimentary canals.

Astute readers may have noticed a complete absence of those plants normally called 'alpines' in the above. The reasons are simple, very few attain the status of pest. 'Snow in Summer', *Cerastium tomentosum* is one; *Geranium pylzowianum* another. The vast majority of alpines, if neglected, discard themselves!

Conversation Piece

Whenever gardeners meet, talk sooner or later turns to the weather; and no wonder, for the microclimates within the garden environment largely determine whether a plant will succeed or not. There are few situations where the cultivator has total control; the orchid-house is one, which is perhaps why it appeals to the rich and powerful. The laws of supply and demand inevitably lead to ridiculously high values being placed on some of the exhibits at the recent Glasgow Orchid Show. Only centuries-old bonzai can compete, and they are really living works of art. Personally I do not wish for the responsibility! Be that as it may, I like to think of the Stone Column as a conversation with fellow rock-gardeners, so why be different?

In a climate as variable as Scotland it has always been the wettest/coldest/windiest in so many years; and the past winter and spring were no exceptions. The November rainfall, at 253mm (almost 10 inches!) was the highest this century, beating 1938 with its 248mm. For some strange reason *Galanthus reginae-olgae* flowered early in the month; usually it is much later, overlapping with the precocious *G. nivalis* cultivars such as 'Atkinsii'. December was remarkable only for a sudden heavy snowfall on the 16th, which caused considerable damage to fast-growing, brittle evergreens such as *Choisya ternata* and *Photinia* x 'Red Robin', also to fastigate conifers like *Juniperus chinensis stricta*. Our local member had far more extensive damage in her garden on the slope across the Glen, at the foot of the Corrieyairack Pass. She sent up smoke signals for weeks, clearly visible from our upper garden. It is interesting to note that while current pruning practice recommends leaving a collar, when branches peel away under the weight of snow, a natural process,

they normally break off collar and all. This time our *Osmanthus delavayi* escaped damage, which is fortunate for the chattering class of local sparrows. A sparrowhawk, given to dining at the nearby bird table, swooped on one side of the *Osmanthus*, driving the occupants to the other. Quick as a flash she was over the top and seized one as it emerged, right outside our dining room window!

January was simply the month of depressions, with twice the normal rainfall, the wettest since 1928. There were no floods here, unlike Perthshire, for the rain was spread out, virtually every day a wet one. No gardening day after day can be so depressing that one almost welcomes the continuation as an excuse for doing nothing. It might be thought an ideal time for writing, but such is one's mood that concentration suffers. Virtually the only time we saw the sun was in the rain-shadow, during a brief trip to Aberdeen. We always try however to do something constructive indoors during the darkest days; this year it was re-organising Poll's slide collection. We purchased a flat-pack, twin door wardrobe, 0.6m deep by 0.9m wide. Once assembled, I fitted four extra shelves. Our slides are stored in two separate systems, the holiday or wild pictures are in chronological order, whereas garden slides are by family and genus. Each slide is simply marked with code letters and a number, e.g. CE91, 198 means "Central Europe 1991", slide number 198 – *Phyteuma globularifolium* in Styria; or CAS 50 denotes *Cassiope* slide number 50, our own hybrid *C. selaginoides* x *fastigiata* 'Freebird'. Records are kept in A4 ring-files. Moving all our slide containers into their own exclusive accommodation freed a considerable space in our bookcases which in turn allowed a complete rationalisation, especially of periodicals. One can always tell the keen gardener's house at a glance, it's full of books!

January was also the windiest for 30 years, and there were enough fallen sticks to keep us in kindling for a year. I sometimes wonder whether the greater quantity of fallen debris is a measure of increasing frequency of strong winds; it appears so in both our own garden and the school drive. Trees planted in the 1920s are now reaching their maturity, so perhaps there are simply more dead twigs to fall, or am I now more observant? There is no doubt that debris build-up is quite considerable. Stepping stones under our front Caledonian Pine, set slightly proud of ground level in March 1975, are now 5-7.5cm below, thanks to a continual rain of pine-needles. In this semi-natural habitat, we now have *Moneses uniflora* spreading nicely to 0.4m across.

There was nothing of note about February and March, just the usual mixture, April if anything was drier than average, and much outside

work was possible during the Easter break. The garden's gain is The Rock Garden's loss, but eventually the weather broke driving me indoors just before the Editors' deadline. As I write this on May 15th, the central heating is on, Tor is adoring a good log fire, I have retrieved an old sheepskin rug to put around my knees, and it is snowing hard outside! With every shrub in the garden in full leaf, all are bowed down under the weight of wet snow. Poll photographed blue meconopsis in full flower in the snow, just before their leafy stems gave way.

A daytime temperature of 5°C in May is of course a temporary aberration. A few days earlier Poll had stopped pricking out because the potting shed was too warm in the afternoon. She usually hangs a shade-net outside the window, one small upper section of which opens. This spring a pair of wrens have set up house in the small gap between the window frame and the inside ceiling, using the open window for access. It is probably a good thing Poll does not understand 'Wrendese', the number of times an angry brown ball of fluff has sworn at her!

A recent British Trust for Ornithology report suggested that birds are currently nesting on average 22 days earlier than formerly. Another pointer to global warming comes from 12.8m below ground in Minnesota, where the mean temperature shows a 1.2°C rise in 30 years. Taking the soil temperature at such a depth evens out short period fluctuations, and eliminates the uncertainty in air temperature measurements, caused by factors such as the precise location of the instruments. There are now so many straws in this particular wind that I am certain there must be a haystack somewhere!

A Tetralogy of Plantings

Progress in the garden itself is generally made in fits and starts, but this past construction period has seen many long-standing plans come to fruition. Never before have we completed four new areas of planting all in one season. The first of these, the full-stop raised bed for lilies was described in the last Stone Column. So far only the fringe benefits, erythroniums and a few fritillarias have flowered there, including two distinct forms of *Fritillaria cirrhosa*. The older plants, from a seed collection by Heather Salzen, are strongly chequered with brown, whereas those from AGS/ES 477 are lime green externally, only spotted with mahogany on the inside. Both are planted in groups so that the tendrils at the tips of the upper leaves can tangle together for mutual support. We did not find this species entirely happy when growing through dwarf Ericaceous plants, contrary to expectations. Of the several Californian species of erythronium, in various shades of white

and cream, which flowered this year, *E. multiscapoideum* is worth noting for the succession of single flowered scapes; which, apart from giving this species its name, extend the flowering period. Up in Poll's frames *E. grandiflorum*, from seed we had collected in 1988 in the Big Horns, and *E. montanum* from the A.R.G.S. exchange flowered well at four years old. When we told Wayne Roderick, the Californian bulb expert, he retorted, "I'm glad I don't live where you can grow *Erythronium montanum*!" The first true lily to flower in their new raised bed was the dark leaved Bhutanese form of *Lilium nanum*, which we had raised from Sinclair and Long 5286. Relatively tall at up to 30cm, its hanging dusky pink flowers, opening wide to 5cm across, are copiously spotted with maroon internally, a real dark-eyed beauty.

The second bed to be planted up this season had also been on the way for quite some time. As mentioned in the last Stone Column, Poll forked leaf-mould and peat into the "Haze" terraces last September, while I started scheme number three, the Upper Gentian Bed, by lifting the turf. November and January were impossibly wet, but I did manage to transfer our Japanese or (semi) evergreen Azaleas, early in December, from their old home down in the frost hollow to justify the "az" in Haze. Some of them had been invaded by self-sown *Blechnum penna-marina*; every scrap of runner was removed from the root-balls (or "plates" more like) and consigned to the outer darkness behind the holly hedge. In addition to fern roots, iris rhizomes, bluebell bulbs, poppers in seed, and all else unsafe in the compost heap, are dumped out through the wicket-gate into the sheep-walk, designated on our local plan as a "Conservation Area!"

The plants represented by the initial letter, the Heaths, were evicted from two of Poll's frame bays early in February to make way for yet more seed-pots. I would not have chosen this planting time, but so far there have been no losses, and frost-heave was negligible. The latter probably would not have been serious anyway, with prompt replanting, because of the compact nature of the root-balls.

March and most of April were taken up by deciduous shrub moving and removing, and the last of the "winter" clearing. Thus it was towards the end of the latter month before the final component, "E" for Ericaceae was added to the "Haze" bed. We simply went to the frames, armed with wooden tomato boxes, and took out all the Ericaceous plants in 9cm pots or larger, excluding only dwarf rhododendrons and a few on the borderline of hardiness like *Epigaea gaultherioides*, *Cassiope wardii* and *Gaultheria sinensis*. The latter are grown planted out in a frame against the front wall; while dwarf rhododendrons are to have their own terrace

bed at the top of the Haze slope, above the contour path from the seats under the larch, to the upper grass.

When planting the Haze itself, the Japanese azaleas had been placed in a diagonal strip, from bottom left to top right facing up the slope. The heaths were placed to the top left, the area most affected by the roots of the aforementioned larch, their uniformity broken by a large *Pieris japonica* 'Purity' transferred from the Orchard Terraces. Both *Pyrola rotundifolia* and *Vaccinium praestans* hitched a ride in the rootmass of this *Pieris*. The space thus vacated was remade and planted with some young *Trillium simile*, the large white-flowered segregate from *T. erectum* illustrated in the 1991 Warwick Conference Report (plate 40). This is definitely not the same plant as *T. erectum* forma *blandum*, its thicker petals are a clearer ivory, and can, on fully adult plants, be up to 15cm (6 inches!) long. Returning to the Haze Bed, the other Ericaceae were planted basically to the bottom right closest to "Mt. Sherman" but the divisions were far from clear-cut. Some of the smaller heathers went as fillers between the azaleas, as did creeping dwarf ericaceous plants such as *Vaccinium vitis-idaea* ssp. *minus*. An Icelandic plant of *Cassiope hypnoides* was placed just to the north of the relatively tall *Rhododendron kaempferi* and the family monopoly broken by the addition of two small sorbus. *Sorbus sambucifolia*, a small shrubby species from northern Japan is said to require a cold climate, so it may well like Askival. It is apparently self-sterile, so we have planted our two seedlings from Halliwell 4071 side by side. One flowered this year, creamy white, aging to almost red. The second sorbus was also a seedling, but in this case a self-sown from Ian and Margaret Young's garden in Aberdeen. It was given to us as a "non-suckering *S. reducta*", as was a plant from Elizabeth Strangman of Washfield Nursery. This latter is now suckering freely, so it is perhaps time I claimed my winnings! The Youngs' seedling is however quite distinct; all our other '*S. reducta*' have dark green glossy leaflets, convex upwards and slightly reticulate, with single teeth. By way of contrast, the native Rowan, *S. aucuparia* has pale green flat leaflets with obvious double teeth. The Aberdeen plant has foliage of an intermediate green, a slightly convex upper surface, edged with the double teeth. This suggests a possible hybrid origin, so we look forward to its first fruiting with great interest!

While I was working my way through my moving list, and completing the above plantings, Poll forked over the whole of the Upper Gentian Bed, as always removing many, many barrowloads of stones. This, of course, dropped the level below that of the surrounding grass; partly to make it up, but chiefly to improve the soil, a 10cm layer of compost was

added. This may appear over-generous, but in our light soil it disappears very quickly. When replanting in the Upper Herbaceous Border, made 1990/91, there are now no signs, other than in the blackness of the soil, of a similar copious addition of organic matter. By Murphy's Law the oldest compost heap was one of the originals in the lower garden. No doubt the next bed to be remade will be down below, while the compost cycle takes us to one of the new upper heaps. Still, emptying this and bringing it down will be rather easier thanks to the loss of potential energy. Conversely, all our activities in making the upper garden are not helped by having to barrow everything up there.

Back in February we had a delivery of 6mm gravel, mainly for making Poll's scree compost. The only local Quarry which was willing to wash this grade, to remove the fine crusher dust desirable in a hard-packed roadbed, but potentially fatal in potting compost, was on the far side of the Black Isle, north of Inverness. To make the transport costs reasonable we had to take ten tons. Three tons were put into each of two bays of the compost shelter, the remaining four had to be laborously trundled up to the top garden for eventual use in Mt. Sherman, the proposed main scree. The route passes above the Orchard Terraces, where a mid-February mild spell had brought our early group of rhododendrons into flower together, until a frost towards the end of the month browned all save only a tall semi-deciduous form of *Rhododendron dauricum*.

The compost layer on the Upper Gentian Bed was left to weather, and hopefully dry out a little, for several weeks. Following a break in the April showers Poll mixed it in thoroughly. The final stage before planting involved sub-dividing the bed into weeding sections no wider than 1.2 – 1.5m with flat stepping stones. Most of these slabs were quite large, 0.4 – 0.5m wide by 0.5 – 0.7m long, just about on the limit for me to carry and drop into position, onto pre-trampled and firmed walkways making up the shape of a Greek letter π .

The planting up of this island bed is probably the nearest thing to "bedding-out" that we have ever done. I dug up clumps of our various species and cultivars of Ornatae gentians, divided and replanted the strongest thongs in irregular patches of from 0.25 to 1 square metres. To separate each autumn gentian group from its neighbours, we searched through the frames for all the small perennials we thought likely to succeed in this ground level bed. Prominent amongst these were pulsatillas, seedlings of the fringed Czech form of *P. vulgaris*, three forms of *P. patens*, two of our own collections at high altitude in the Rockies, and a dark blue Scandinavian, another generation from our very strong growing *P. apiifolia*, and *P. halleri slavica* from S.R.G.C. seed. The first

mentioned fringed pulsatillas will probably prove to be variable from seed; we planted several dozen and will select down as they flower. Other sections of the genus *Gentiana* were represented by *Gentiana pannonica*, *G. purpurea* and *G. kochii* from Europe, *GG. parryi* and *affinis* from America, *G. platycaule* from Alaska and *G. trichotoma* from China. Conventional wisdom has that the ornata-type gentians have to be replanted every few years, but we find that they can often be left alone for 10-15 years before they start to go back seriously and have to be divided. Some, such as *G. x 'Christine Jean'* root down along their prostrate stems, and so move themselves to pastures new.

The fourth and final area to be planted this spring, while not entirely new, has been so extensively reworked as to qualify. The old Azalea Bed had never been really satisfactory either aesthetically or culturally. Sandwiched between an ericaceous raised bed on one side and the Lewisia Wall on the other, it was on too intimate a scale for its rapidly expanding, but poorly flowering mounds of Japanese azaleas. Removing these to the Haze Bed paved the way for a complete change of use. We decided on a limestone scree, to complement the proposed main acid scree in the upper garden. I have heard the opinion expressed that limestone is unnecessary in the alpine garden, that plants native to calcareous areas will grow perfectly well without lime. Having never conducted any properly controlled trials, I cannot categorically argue with this, but to me it just feels right somehow to use the closest approximation to a plant's native substrate.

We are fortunate in that we have a local source of limestone, the Highland Lime Company near Fort William. Describing themselves as 'Pride of Ben Nevis', the quarry is actually close by the bottom station of the Aonach Mor gondola lift. Thanks to the latter they now have a brand new high quality access road, only 50 years after they started operating! Skiers and tourists are clearly far more important than a long-established viable local business. The stone being worked is a medium grained light grey recrystallised limestone, which becomes a beautiful blue-grey when wet. We think it far more attractive as a background for plants than either white carboniferous "Westmorland" limestone or the yellowish "Cotswolds" type. It is a member of the lower Dalradian series of metamorphosed sediments, like the well known Ballachulish slate which roofs most of the older buildings in this area of the Highlands. At almost 600 million years old it is one of the oldest limestones being quarried, much older than the Durness limestone of the extreme North-West.

Highland Lime's main market is for ground limestone flour, which is added to asphalt to harden it. Because it is a porous stone it binds better



Fig. 77 *Anemone speciosa*, Cheget, Balkaria (p263)

Michael Almond

Fig. 78 *Primula algida*, Adyrsu Valley, Balkaria (p262)

Lynn Almond





Fig. 79 *Primula bayerni*, Yonomsu Valley, Balkaria (p261)

Michael Almond



Fig. 80 *Anemone alba*, Adyrsu Valley, Balkaria (p262)

Michael Almond

Fig. 81 *Tanacetum coccineum*, above Gounib, Dagestan (p265)

Michael Almond





Fig. 82 *Campanula* sp. Gounib, Dagestan (p265)

Michael Almond

Fig. 83 *Convolvulus lineatus*, Gounib, Dagestan (p265)

Michael Almond



with the tar, than a non-porous rock such as granite. This porosity means that a limestone scree bed will be a different physical environment for plant roots, quite apart from the alkalinity. In addition to ground limestone, they also produce a 3mm grit for animal feed, but this is too fine for use in a scree compost. Limestone must be heated to dry it before crushing, so any oversize from the 3mm is naturally recycled through to save energy. The manager kindly agreed to spill this from the conveyor into large one ton polypropylene bags, giving us an excellent mixture of sizes from 3-9mm with the vast majority around 5-7mm. As such it will make a more natural looking top-dressing than a uniform grade. A local contractor, who takes his 3 ton lorry to Fort William every day, agreed to transport our bags for a nominal charge; lacking the mechanical handler he had to tip the mound onto the drive, but no damage was done to bags or drive surface – just stand well clear! They were easy to empty using barrow and shovel.

The pre-existing soil in the old Azalea Bed had been extensively enriched with peat and leafmould and so was high in organic material. Therefore we just added a 12-15cm layer of the limestone and mixed it into the top 20cm or so. The easiest way I found to do this was to use a small border spade, rubbing out any lumps with the fingers like making pastry. Any stones over 1.5-2cm, overlooked in the original preparation as an Azalea Bed, were removed. The stepping stones were raised, by levering up with the spade and ramming compost underneath, so that they stood 7.5cm clear. This was to leave space for a final layer of said thickness of the chippings. Thus the bed will approximate a natural scree with the richest organic soil at the bottom, then an admixture, and pure stone at the top. When planting as always we allowed the pots to dry somewhat, and shook the roots out, combing gently with the fingers if necessary. Mindful of the final top-dressing, a 5-7.5cm layer of our chippings, the plants were set high. As the vast majority had long root systems this was not a problem. A barrowful of the limestone chippings was kept handy, so that as each group was planted, it could be top-dressed more or less straight away.

Poll considers that this bed is shaped like a foot, I thought a cartoon club, 8m long by 3m at the widest point; sloping gently upwards from the grass, to the handle or heel, the latter about one metre across. I started planting at the lowest point so that the top-dressing layer would not spill onto the next area to be planted.

The majority of the plants placed here were classic alpines of the calcareous parts of the Alps. Apart from the big four, primulas, gentians, campanulas and saxifrages, there were various ranunculus, and the

related callianthemums, several dianthus naturally, and representations of some of the lesser known genera, like *Bupleurum ranunculoides*. A grassy-leaved Umbellifer, this has heads of greenish-yellow flowers on stems of 15-20cm, the colour mainly provided by bracts as in *Astrantia* or *Hacquetia*. Our favourite Western mountains were not forgotten, with two species native to the limestones of the Big Horns: the running dwarf *Clematis tenuiloba* and the bright blue *Penstemon caryi*. A solid backbone to the bed was provided by three daphnes, *DD. alpina*, *sericea* and the dwarf high alpine form of *D. mezereum* sometimes called "var *alpina*", which we had found in brilliant red fruit not far from the haunts of *Campanula raineri*.

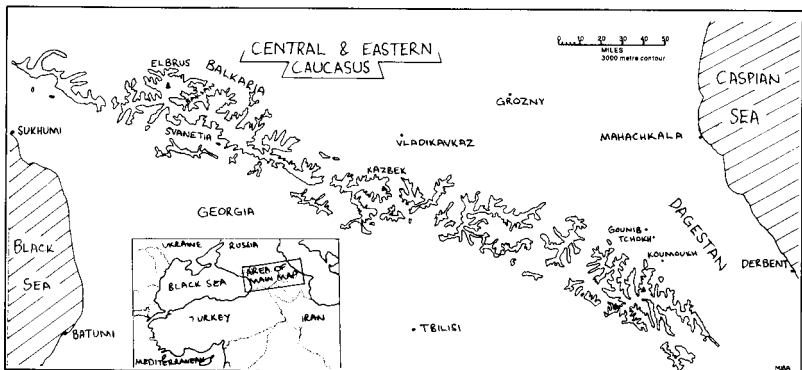
In all, twelve tomato boxes of plants were slotted into this bed, but looking into the frames it has made very little difference. No matter how many new areas we bring under cultivation, the relentless pressure from below continues, an endless succession of young plants from seed. Colour combinations thrown up amongst Poll's rows of potted seedlings can on occasion be quite startling. A couple of weeks ago, five *Meconopsis delavayi* flowered, a rich shining blue-purple, nearby *Primula deorum* was an equally intense colour, but on the red side of purple, while *Gentiana angustifolia* from the French Pre-Alps was a pure medium blue, lacking any trace of the dark purple which can suffuse *GG. clusii* and *kochii*. Single white cups of *Pulsatilla alba* provided a welcome calming influence.

The answer to our space problem is obvious, stop sowing seed; but kicking any obsessive habit is never easy. I am sure that, if I absolutely had to, I could live without red wine, dogs or seed-sowing, but life would be far less interesting! Seeds are Nature's way of reproducing and dispersing her plants, and by their sexual nature of re-sorting the genes so that variations and hence more rapid evolutionary change can occur. All we gardeners do is to provide the environmental conditions necessary, the magic is pre-packaged!

The Caucasus: Part II: Along the Caucasus

MICHAEL J. B. ALMOND

After our successful but exhausting trip to the central Caucasus in July 1991 (see **The Rock Garden** vol. XXXIII, part 2, no. 91, pp132-141), we decided that we would like to explore the area further. As luck had it the same company (Exodus Expeditions) ran a walking tour in July 1992 which enabled us to explore some parts of our 1991 route at a more leisurely pace and at the same time offered the opportunity to visit the eastern Caucasus – an area little visited by westerners.



For the first four nights of our time in the mountains we stayed at the Old Jaylik Hotel in the Adyrso Valley (a tributary of the Baksan Valley), where we had spent one night the previous year on our way up to the Mestia Hut. The season appeared to be about two weeks later and so, as well as being able to explore the area far more fully than we had done the previous year, even when we were walking exactly the same route as before, we saw plants in flower that had finished flowering in 1991. As well as walking up the path towards the Mestia Hut as far as the bottom of the recent glacial moraine (without the heavy packs we had in 1991 and also with far more time to explore off the path at our disposal), we walked up two of the steep side valleys of the Adyrso Valley, in both cases as far as the permanent snow or recent moraine.

We also had time to explore the grassy banks, scree and cliff above the hotel more extensively than the brief foray (cut short by low cloud and rain) the previous year. In the woods by the hotel, in addition to the

Moneses uniflora we found the previous year, we also found the coral-root orchid, *Corallorhiza trifida*. On the edge of the screes running down through the woods and on the steep grassy slope above the woods there were *Allium victorialis*, *Aquilegia olympica*, *Arnebia pulchra*, *Coeloglossum viride* (the frog orchid), *Polygala* sp, a white cornflower, wood violets, vetches and various *Campanula* species. Higher up, in the grassy gullies between the rocky outcrops of the cliffs and on the rocks themselves, were *Rhododendron caucasicum*, *Anemone narcissiflora* (or one of the other species into which the Flora of the USSR splits it), *Anemone speciosa*, *Pulsatilla aurea*, *Anemone albana*, *Primula algida*, *Gentiana verna* ssp *pontica*, *Potentilla oweriniana*, *Dryas octopetala*, *Daphne glomerata*, *Draba bryoides*, *Campanula tridentata*, *Viola caucasica*, *Lloydia serotina*, *Myosotis* sp., lemon-yellow mountain pansies and saxifrages. It was certainly a very rewarding climb and provided a taste of what was to come, although many of the flowers were not in very good condition and (as the climb was undertaken on our first day after a long drive to Jaylik from the airport at Mineralnye Vodi) the light was fading fast.

For the whole of the three days we were at Jaylik the weather was splendid – in marked contrast to the short time we spent there the previous year. On our first full day we walked up the tributary valley behind the hotel (to the north-east), the Yonumsu Valley. It is a very steep valley with a lot of debris down the centre of it from a glacial lake which collapsed several years ago. In the lower part of the valley we found *Jurinella moschus* ssp *pinnatisecta*, *Onosma* sp and a tiny, pale blue annual gentian with a flower no more than five millimetres across. As usual there were lots of campanulas in the turf and, higher up in a damper area, we found a lot of *Primula algida* including some very fine, dark pink specimens. Alongside the stream and in the shade of an enormous boulder we were also very pleased to find a mass of *Primula bayerni* (Fig. 79, p.255). This is the white nivalid primula which grows only in the central Caucasus and which we had seen in flower in only one (difficult to photograph) spot the previous year. We also came across *Primula veris*, *P. elatior* ssp *ruprechtii* (lemon yellow), *P. elatior* ssp *meyeri* (pink), *Gentiana verna* ssp *pontica* and *Daphne glomerata* growing in the turf beside the path as we trudged up the valley. The opposite, steep and north-facing, slope was covered with white *Rhododendron caucasicum*. Higher up among the rocks we found *Dryas octopetala*, *Potentilla ruprechtii* (yellow), *P. oweriniana* (pink), *Androsace villosa* (?) and several saxifrages: one yellow, one very similar to *S. juniperifolius* (possibly *S. scleropoda*), *S. cotyledon* and another white one. We completed our walk near to the snout of the glacier at the head of the valley.

On the next day we walked up the main Adyrso Valley above Jaylik, towards the Mestia Hut, where we had spent two nights the previous year. As we were not carrying heavy packs this year and were able to explore completely at our leisure on the return walk back down to the hotel, we were able to see much more than we had done before. The difference in the season was illustrated by the fact that a grassy hillside beside the path that we passed along on our previous visit was a mass of mountain pansies whereas we had not seen a single one before. This *Viola* sp. appeared to be slightly larger than the *Viola altaica* that grows in Turkey. Most of the flowers were a fairly uniform lemon-yellow, although varying in their shape and in their markings; a significant minority of the flowers, however, was a darker yellow and a few were a dark mauve. Another flower we saw on this walk that we had not seen the previous year was the dark maroon pulsatilla which appeared to be the *Anemone albana* (Fig.80, p.256) of the Flora of Turkey (once called *Pulsatilla violacea*). We were also pleased to note that the primula we had seen which was past flowering in 1991 but which we had deduced to be *Primula bayerni* was indeed that species – although even now it was past its prime and not in such good condition as the ones we had seen the previous day (in this case it was growing, again in running water, on a more exposed hillside and not in the shade). Other flowers we saw that we had not seen the previous year included masses of a lemon-yellow *Pedicularis* sp., *Rhododendron caucasicum*, *Arnebia pulchra*, *Primula algida* (Fig.78, p.254) (including a few white specimens) and what appeared to be an intermediate between *P. algida* and *P. auriculata* but which was, probably, simply a compact form of the latter.

On the third day of our stay in Jaylik we climbed up the Koiaugutan Valley, a tributary of the Adyrso directly opposite the one we had gone up two days previously, the Yonumsu Valley. After crossing the Adyrso torrent we walked through water meadows ablaze with marsh orchids (probably *Dactylorhiza majalis* ssp. *caucasica*) to the scree at the side of the waterfall that tumbles out of the upper reaches of the valley. Among the masses of geranium at the base of the scree was a magnificent, buttercup-yellow clump of very large cowslips (*Primula veris* ssp. *megacalyx*) and also lots of water avens (*Geum rivale*). Higher up, the scree was covered in *Arnebia pulchra*, *Aquilegia olympica* and *Pulsatilla aurea* seedheads. Once we got above the scree and on to the rocks and turf of the high valley we found *Gentiana verna* ssp. *pontica*, *G. pyrenaica*, *Campanula* (several species), *Coeloglossum viride*, *Dryas octopetala*, *Primula algida*, *P. elatior* ssp. *meyeri*, *Anemone speciosa*, *Daphne glomerata*, *Trollius ranunculinus*, *Anemone albana* and, on the rocks, *Potentilla oweriniana*. In wet flushes and beside the stream there was *Primula auriculata* and, nestling beside a rock on an islet in the stream,

a beautiful blue *Corydalis*, probably *C. alpestris*. The slopes above the stream on the opposite, northerly facing, side of the valley were carpeted with *Rhododendron caucasicum*. On the rocks higher up the valley, below the snowfields leading on to the glacier, there were *Draba* sp. (*bryoides*?) and *Androsace* sp. (*villosa*?).

The next morning we left Jaylik and were driven down to the main Baksan Valley to spend one night in a hostel near the Itkol Hotel. During the day we were able once again to explore the flanks of Cheget, facing the beautiful mountain called Dongusorun, at our leisure and in brilliant, if cold and rather windy, weather. The variation in the seasons again meant that we saw lots of flowers that were either finished or past their best on our previous visit. Large tracts of the hillsides were carpeted with *Rhododendron caucasicum* in full flower, and with views of Dongusorun and Elbrus as a backdrop it was superb. In places the normal creamy-white colour was replaced by a russet pink tone which added variety to the scene. Other parts of the hillside were white with *Daphne glomerata* and there were also large drifts of the golden-yellow *Pulsatilla aurea* and of the more variably coloured *Anemone speciosa*, usually a full lemon-yellow but sometimes paler (Fig.77, p.254); and often mixed in with the blue of the campanulas. We were also particularly pleased to find the *Fritillaria latifolia* in full flower in a wet flush alongside the path (we had seen only one bedraggled specimen, well past its prime, the previous year). We also saw many of the same flowers that we had seen the previous year and perhaps the only specimen worthy of particular note was a large clump of exceptionally gaudy *Primula auriculata*. Lower down the valley, down the path to the bottom station of the chair-lift, the *Lilium monadelphum* was, once again, a breathtaking spectacle (see front cover). Also on the steep hillsides of the lower valley there was *Aquilegia olympica*, the statuesque red *Stachys macrantha* and a mass of *Anemone narcissiflora*.

A ten hour bus journey eastwards to the Caspian Sea occupied the next day. We arrived in Mahachkala, capital of the Republic of Dagestan (still part of the Russian Federation), in torrential rain which had caused a general power cut. The eastern end of the Caucasus is generally much drier than the west and the north is drier than the south. One would not have credited this as we drove the next day through Dagestan and up into the north-eastern foothills of the Caucasus. The torrential rain (which had continued all night) continued all day, finally giving way to heavy, wet snow as we climbed above the 1000 metre contour. We stayed the night in the village of Kumukh and the villagers told us that not even the oldest inhabitants could remember the area ever having suffered such weather in July. The next morning the weather was cold but fine and the snow was turning to slush. Before it did so it had brought

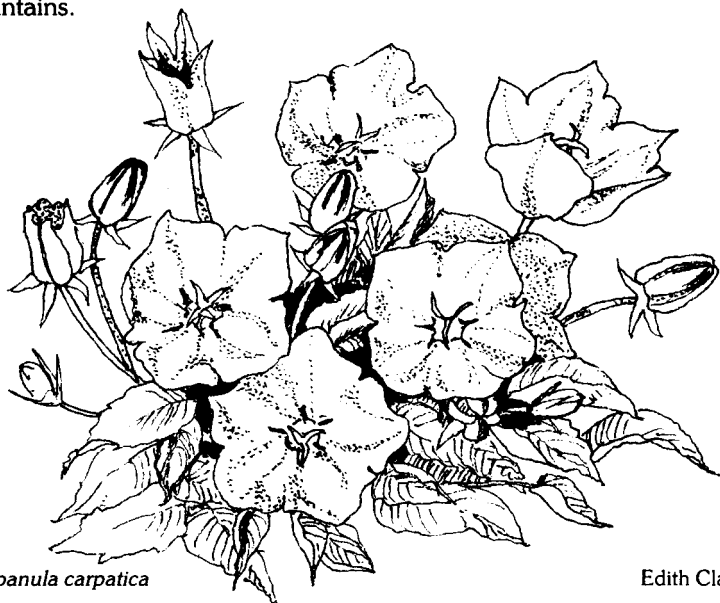
down innumerable tree branches with its weight and the village presented a rather sorry spectacle. After exploring the village, with its quaint Turkish-style houses and mosques, we set out westwards across country. Conditions underfoot were extremely trying, with slush and mud at lower levels and thick wet snow lying over long grass on the steep hill-sides higher up. We walked across a pass of about 1500m to the village of Megev in about four hours. Any flowers there may have been along the way were covered by the snow and the only things we saw of any interest were a few cowslips (*Primula veris*) on the way up to the pass and patches of *Campanula* sp., *Putoria* sp. and *Gypsophila* sp. on tufa-like boulders on the way down to Megev. On the grassy slopes above Megev the snow had spared a few *Gladiolus*, some *Dactylorhiza* and a goodly number of fine *Lilium monadelphum* (see back cover), although many more had been smashed down by the snow. From Megev we continued for another couple of hours to our destination the village of Chokh.

Before leaving next morning we explored the graveyard above the village and found more *Lilium monadelphum* along with *Campanula glomerata*, *Tanacetum coccineum*, *Gymnadenia conopsea*, *Campanula* sp. and *Geranium* sp. We then drove down into the valley below Chokh to a rough suspension bridge across the river, which was strong enough for foot traffic only. We crossed this and set off up the track to an ancient, deserted village just visible perched on the ridge 500 metres or so above us. The ground was dry and well grazed and we saw little of interest on the way up. We picknicked at the village, explored it and visited the house of the old couple living there. They had been banished from the village with all its other inhabitants as part of Stalin's collectivisation schemes in the 1930s but had returned to live there after they had retired. They and one young man, who seemed to be a shepherd, were the sole inhabitants apart from a couple of donkeys and some chickens. We walked down from the village a different way and passed through some woodland where there was an undergrowth of *Rhododendron luteum* which was just finishing flowering. In the woods we also came across *Gymnadenia conopsea* and *Platanthera chlorantha*.

The next two nights were spent in a small mountain hotel high above the little town of Gounib. During the intervening day we walked up the valley above the hotel and on to the ridge beyond. We were probably between about 1500 and 2000 metres above sea level and the rock here is all limestone. The flora was completely different from that we had seen in the central Caucasus but nevertheless quite rich and varied – much more so than we had expected. The track above the hotel was lined with magnificent wild roses of all shades from creamy white to dark pink. Among the rose bushes towered stately *Lilium monadelphum*, one of which boasted a magnificent fourteen open blooms on its flowering

spike. On the rocks alongside the track were various campanulas including one which reminded me somewhat of *C. rupestris* (although clearly a different species). In the meadows there were lots of *Gladiolus* sp. together with the beautiful pink *Tanacetum coccineum* (Fig. 81, p.256), red *Echium* and orchids – *Gymnadenia conopsea* (or something very similar), *Platanthera chlorantha* and a very robust *Orchis coriophora*. A very attractive small *Campanula* sp. scrambled among the rocks higher up the ridge (Fig. 82, p.257) and there were also other *Campanula* sp. (some like *C. aucheri*) and *Onosma* sp., *Scutellaria* sp. with silvery leaves, *Alyssum*, *Helianthemum* and a very attractive small *Convolvulus* with long silver leaves, probably *C. lineatus* (Fig.83, p.257). Higher up in the turf of the mountain pasture there were gentian leaves (like a small *G. septemfida*) and small bushes of *Potentilla fruticosa*. All the time the fine views were enhanced by the unseasonal snow on the hilltops in the distance.

At the end of our trip we felt we had done quite well – ours was (as far as we are aware) the first western tourist group into this area; and the bad weather could easily have done far more damage to the fairly rudimentary communication system of the area that it had in fact done. Our all too brief foray into the north-eastern foothills of the Caucasus in Dagestan had been very enjoyable and interesting but left us wishing we had had far more time and had been able to get much further into the mountains.



Campanula carpatica

Edith Clark

On Saxon Hills

KARL-HEINZ NEUWIRTH

If I were to be writing about Anglo-Saxon Hills, there might be a great deal to talk about; not only on matters of the countryside, or to entertain the historians; you will find there are fine gardens and wild flowers, too, about which you know far more than I. However, the Saxon Hills I am referring to are on the other side of the North Sea, opposite those shores where Roman Britain first came to meet the Saxons as a people. The maps, though, hardly indicate much in the way of hills, but Saxon country is a lot more than coastal flats and marshes. In fact, historians might be hard put to describe the confines of Saxon country; anywhere within the modern German state of Saxony, along the northern borders of the Czech Republic, down along the River Elbe to the North Sea and Lower Saxony. Part of the Saxe-Coburg territory has also become part of modern Bavaria, and many more Saxon principalities can be found in what now is Thuringia. In total, that certainly covers a good deal of hill country, which means gardens and wild flowers, too, and it is about these that I propose to write.

Probably at the very heart of the Saxon Country is the Brocken, which rises to a height which in German terms is easily called a 'mountain', and is the highest point in the Harz Mountains. Brocken translates as 'lump', and a bit of a lump of massive granite it is, even on the horizon, where, on clear days, I can see it from my own garden, at a distance of about 60km in a south-easterly direction. I will talk about the Brocken another time, as it has only been possible to visit it since 1990, the mountain having been a strategic point on the eastern side of the Iron Curtain. Legend has it that the Brocken, or 'Blocksberg', was the popular meeting place of witches. Of these there is little knowledge today, but the Brocken is very popular now, and it will still be some time before one might walk up it without being in a crowd as busy as any crowd in a high street. A height of 1,142m may not put the Brocken among the highest 'mountains', and yet, the Harz Mountains were high enough to help plants which one would expect to find anywhere in the Arctic or the Alps, survive the post-glacial epoch.

Any serious rock gardener would be delighted to make such a place his garden, and again I will talk later about the Brocken Botanical Garden,

Garden, which miraculously escaped the devastations of “strategic considerations”. But then, there are not too many hills around the Brocken, and gardening at a height of a mere 200m can still provide some pleasure!

Gardening in my own hill garden will make up part of what I talk about, but for the last few years, since 1990, so much more of ‘Saxony’ has opened up, along with so many more exciting hills and gardens, with a wealth of plants, plants that no Plant Finder has listed as yet, and I also propose to write about these plants, and how I can grow them.

Gardeners behind the Iron Curtain certainly were not idle, and collected plants that were unknown and untried in the West. This might be explained by different climatic conditions – this isn’t the Balkans or Central Asia, but neither is Saxony along the rise of the Erzgebirge (Ore Mountains; not very mountainous mountains again, but more of a chain of wooded hills). In fact, in places one is reminded of the English Midlands, the country looks so green, with streams coming from the heights where the clouds finally drop their load, and rhododendrons growing in unexpected lushness. Almost annoyingly for the average gardener New Zealand alpine seem to thrive here, too, but more about this later.

My own garden is on ‘Lark Hill’, which is certainly a ‘Lark Mountain’ in German terms; nowhere higher than a mere 250m, with a steep rise to the west, sloping off towards the east. This puts the sloping east side into a rain shadow, explaining why locally the place is known as ‘Dry Fields’. In summer thunderstorms frequently pass along the northern end of the hill and pour down over the city below, while my garden still enjoys sunshine, and suffers for want of water. About 200 million years ago the rock of this hill was laid down by a sea, during the Triassic period, and it was then lifted through the mountain building activities of the Brocken. A full sequence of sediments has been uplifted in narrow bands, with sandstones and limestones in frequent alternation. This hill is limestone, betraying its marine past by an abundance of fossils.

Arguably, limestone country favours a rich flora. Lark Hill provides fascinating woodland walks, and there are places with open scrub, and dry grassland full of flowers and butterflies in summer. Just over a hundred years ago, this area was all given over to sheep, with nothing remaining of past woodland. Surprisingly, a woodland flora redeveloped from this, which is difficult to equal within miles. In early spring, *Hepatica nobilis* is abundant in some parts, soon to mingle with *Anemone nemorosa* and *A. ranunculoides*. Where will I find their hybrid? *Aquilegia vulgaris*, with an occasional dull pink form, also isn’t difficult to find. There was *Primula elatior* in late spring. Early summer brings *Campanula persicifolia* in its pretty, though modest wild form, with only

a few of its big bells. Large patches are overgrown with *Buglossoides purpureo-caeruleum*, making long growth which roots at its tips, and fine in flower only in sunnier spots. Far less spectacular, but interesting in its own way, there is the occasional *Bupleurum longifolium*. Another of its kin is the rare *Laser trilobum*, the yellowish-green umbels being of little consequence, but with leaves of strange beauty. This often grows to more than 150cm, and thus may be a bit large for the average rock garden, though. *Lilium martagon* might also be considered rare – here it is in no way difficult to find, but the flowers are only of a dull purple. The finest show of any one plant, though, is put on by a grass, which covers some places on the westerly slope – *Melica nutans*, which has a beautiful fresh green colour, and charming purple, dangling spikelets, lined up on a gracefully arching culm. Only last year I was successful in making this grass host of that particular parasite, *Melampyrum nemorosum*. This has its flowers first among golden/yellow bracts changing to vivid bluish-purple ones at the top, making it some sort of an answer to the American *Castilleja* species. I am hoping for more success with this!

Late-afternoon sunshine can make the *Melica* slopes a picture of incredible beauty. It's at its best at about the time further down, suiting its name, the lily-of-the-valley, *Convallaria majalis*, pours its sweet smell into the soft breeze that drifts uphill. The *Convallaria* keeps itself to a peculiar part at the bottom of the slope, where the soil seems to have less lime content. This also seems to suit *Veronica montana*, which is abundant, although none of the showier veronicas are present. *Hypericum pulchrum*, which my 'Flora of the British Isles' calls "a very elegant plant", resists all my attempts to move it from here onto the limy soil of my garden. Much less attractive, and much less fussy, even to the point where it becomes a weed in my garden, is the deceptively called *Hypericum montanum*.

It's only at the foot of the slope that the soil can be found in considerable quantity. Elsewhere, the cover is only very thin, and frequently, flaking limestone comes to the surface, making it so much more surprising that so many plants can flourish the way they do. Leaf-fall from the beech trees doesn't appear to do a lot for the accumulation of topsoil. Any humus that there is seems to disintegrate within a very short time, which also makes it difficult to do much for the soil in my garden. There are very few pockets where sufficient humusy soil grows *Actaea spicata*, or *Paris quadrifolia*.

Actea spicata is among those berry-fruited plants that find their way into my garden through the services of birds. There are also *Daphne mezereum*, *Lonicera xylosteum* and *Berberis vulgaris* around the hill, and they all have already found their way into my garden.

Rarest among my finds on Lark Hill has been a single plant of *Aconitum vulparia*, now probably destroyed by tree felling work. This is no nature reserve!

Not many of the woody plants are likely to be of great interest to the rock gardener here, but *Clematis vitalba* certainly is successful here, climbing high into the highest tree tops, with stems of twisted ropes sometimes as thick as an arm. Seeds of this *Clematis* need no bird to travel, and make one of my worst weeds – hardly noticeable the first year, and easily overlooked the second, but in the third year reaching awful dimensions! There was a single seedling with dark red foliage, but this didn't fancy being potted up. Was it only diseased, or would it have been a splendid plant, with white flowers and seed heads being offset by dark leaves? Surprises of this sort are always welcome, but even this would be a horror of kinds if it covered as much ground as the ordinary vine, rooting along its way growing all round the place.

The red-berried *Sambucus racemosa* also surprises me repeatedly, defying all information that it avoids limestone. The one bird-planted bush in my garden could never have heard about this wisdom, growing from almost solid limestone rock. Up in the woods, the situation is no different, and a yellow-leaved plant was in no way chlorotic from an abundance of calcium carbonate, as ordinary green-leaved ones grew from almost the same spot. This isn't Stem's 'Chalk Garden', for many reasons, but it will still be interesting to note which plants will put up with the conditions of this garden.

Originally there was no rock apparent in my garden. Instead, there seemed to be a layer of rock fragments in either clay or loam. Almost accidentally I hit upon the edge of what turned out as a rock layer, and ever since then I have tried to figure out the geological past of this ground. A well-rounded granite boulder and colourful flints betray the overlay of ice-age glaciers, and the melt-waters of the ice might account for peculiar distortions of the rock strata, with large parcels apparently being pushed down hill, leaving a kind of diagonal cleft in the ground, which I still hope to retrace. The strata are separated by crumbly white clay, which, when wet has the consistency of soap. A lot of this clay must have been washed across the ground when the glaciers melted, explaining infills of rounded limestone pebbles in clay. Then there came the post-ice age duststorms, depositing a layer of loess. I guess it was perma-frost that pulled up rock fragments into the top layer, and indeed there seem to be traces of frost hollows filled with finest silt of almost the colour of chocolate.

The underlying rock is of a different colour, and this I did not want to

leave uncovered. Had I not wanted to have a rock garden, and had I not even considered ordering a lorry-load of rock? This new rock outcrop, however, has a smooth surface, which has attained a lovely golden colour, and as limestone frequently goes, the rock forms an undulating pavement of a rock puzzle. After a while the clay infills can be extracted from the cracks, and room for a new plant is made. My plants seem to love it this way! But, moving a plant at a later date need not be considered, and I shall have to learn a lot more about propagating.

Logic tells me that there still is a lot more attractive limestone pavement where at present there are still clay and rubble more than a meter deep, but could I be tempted to remove more of that?

It probably isn't too strange an idea to complement the natural rock with something to suit plants which don't like the limestone, and so I have removed some of the 'base rock' and constructed something only remotely similar to the original, using sandstone blocks instead. It remains to be seen how successful this construction will be with plants I decided should grow there. Frequently I find it difficult to decide about the preferences of plants. Mentioning an interest in *Penstemon*, that amazing Czech gardener, Vaclav Pleštil, almost overwhelmed me with seeds of a wide range of *Penstemon* spp. which he believes would find the limestone to their liking. Maybe I should try harder to extract the relevant information from the American floras, as I well know that there is no general rule that this genus is biased against lime. *Penstemon pinifolius* was the first of these plants that I learned would even like this rock, and planting it in full sun into the top stratum, it has grown to something looking more like a dwarf conifer, and definitely not looking quite as drawn as it can frequently be seen.

Among the seeds from V. Pleštil there were also many *Astragalus*. These I take to be quite suited to limestone, while his *Oxytropis* seed still sits in the seed trays, giving me a headache as to where to put them, feeling that these would prefer a very different kind of soil. I have tried a few of my seedlings on the mining refuse that can be found in the Harz Mountains, containing metals in sufficient quantity to be toxic to the regular plant life, and to me it appeared as if North American 'loco'-*Oxytropis* somehow thrived on toxic soils.

In a way it is very unfortunate that all these refuse heaps are becoming covered up with uncontaminated soil, because that will put an end to a very unlikely natural 'flower garden'. With only a few birches to set an accent, there is often a neatly spaced composition of a quartet of plants which tolerate the metal content; namely a heavy-metal form of *Silene vulgaris*, being much smaller in all parts, contrasting its glaucous leaves with often strongly red stems and calyxes. Next there is *Minuartia verna*

ssp. *hercyna*, forming neat mossy buns, and hardly at any time during spring and summer without its white starry flowers. Another heavy-metal form is equally prolific in continuous bloom, *Armeria halleri* – which may also be considered a subspecies of *A. maritima*, and to distinguish the difference needs some intelligence. Not particular to mining refuse, but growing in much tighter cushion form, and again much more prolific and neater in flower, is *Cardaminopsis halleri*. It has yellowish-green, somewhat ruffled foliage and fine flower stems, spreading away from the centre, with clear white flowers which seem to hover in a fine haze in a rather pleasant fashion. There is a form with reddish flowers which I haven't yet been able to find, but that may be something to look for in the Harz Mountains.

There is another *Cardaminopsis*, *C. arenosa*, which apparently has a similar preference for inhospitable places. In the vicinity of Berlin I have frequently found it with unspectacular white flowers, but not far from here I once noticed it from a moving train, making quite a show among the ballast of a redundant rail track! These were of a vivid pink, though, and eventually made me return for seed, and it hasn't left me since. It may become a weed in some gardens, but when I tried to auction a pretty one that had seeded into a pot where something better had died, it made everyone mad, and went for an embarrassing 8 DMs! Being only a biennial, this would have been a short-lived pleasure.



Cardaminopsis halleri
Karl-Heinz Neuwirth

Observations on Gentian Seed

RICHARD HANCOCK

Not, I hasten to add, anything to do with germination and subsequent treatment of same; as I write the seed is still in its packet and I am on the roof garden of my hotel on a brilliant, warm, sunny morning in November in Kathmandu. Anyway, many are better qualified to write on that aspect – would that they shared their experiences with lesser mortals. This is merely the thoughts and observations of an interested amateur who had the good fortune to be invited to accompany a major mountaineering group into a remote area as ‘Expedition Botanist’ – a flattering, if inaccurate, term apparently based on two previous plant hunting trips to eastern Nepal and ownership of a copy of Polunin & Stainton.

The area in question is the upper reaches of the Hinku and Honggu Valleys on either side of the Mera La (5656m) and operations were conducted from Chamlang Base Camp, including a three day excursion to the upper parts of the Honggu below the spectacular south face of Lhotse. Three gentians are involved: *G. depressa*, *G. ornata* and a small starry flowered species akin to *G. carinata* as illustrated in Polunin & Stainton which is *G. nepalensis* (Fig.85, p274). Herbarium specimens of all three were taken for Edinburgh RBG who have confirmed identification. A fourth gentian (*G. algida*) was seen but behaves differently and is therefore excluded.

Over the years at autumn shows I have heard speculation from the admiring crowds round award winning pans of *G. depressa* as to precisely when the plant sets its seed, flowering as it does so late in the year, even that it holds its seed green in the pods until the snow melt the following spring. Certainly I know of no-one who has been able to produce viable seed in cultivation; our late autumn seems too dark and cold. So what does it do in the wild in the cold of considerable altitude in late October and November?

The climatic conditions of its native land seem, at first sight, distinctly unhelpful. During the month spent at Base Camp (roughly the whole of October) at 4750m the nights were invariably frosty, towards the end of the month down to -12°C , and while the days started brilliantly sunny and warm, mist always bubbled up from the valleys below and from as early as 10 am and never later than 2.30 pm we were in freezing fog.

There was no rain throughout the period, but in the last week very light snow showers occurred at night, interestingly coming up from lower altitudes rather than descending from higher. There was a cold breeze much of the time, dropping at dusk.

Conventional pollinators were conspicuously absent. I can recall two bees and very few flies – so how are the plants pollinated? The short answer, from extensive observation of numerous colonies, seems to be that the majority of them aren't. My first attempt at seed collection yielded three seed pods from twenty-four dead flowers. Perhaps I should state at this point that the gentian around Base Camp was *G. ornata* and was in full bloom at the beginning of October but completely over by the end. *G. depressa* was absent from this area but replaced *G. ornata* completely on the Hinku side of the pass. This was in bloom at higher altitude (5000 m+) in early October and still very much in bloom lower down (4000 m) at the beginning of November (Fig.84, p.274). I put this apparent contradiction down to the sheer depth of the valley which is in deep shade much of the time, while the upper slopes are bathed in sunshine for about twice as long per day. The little *G. nepalensis* was everywhere in the turf up to about 5000 m, in bloom in early October, in seed by the end.

Extensive searches of the colonies taught me to look in certain places rather than others for seed. Colonies in exposed places, ridge tops, on boulders or windswept slopes generally yielded very little; the failure rate was not infrequently 100%. Easily the best sites were warm, sheltered hollows below the big lateral moraines to the west of Base Camp where the success rate was nearly opposite, which leads to the speculation as to what pollinator had achieved this. Clearly not wind, as the windiest sites had the highest failure rate. Also pollination was often very local from colony to colony. At the time I felt this was the work of some wingless insect or beetle, as few winged insects were seen and seemed to have been blown up the valley from lower altitudes. This theory seemed to be reinforced by the fact that maturing seed pods had suffered fairly considerable damage from a tiny brownish grub which bored into their sides. This damage was also very local, generally in clusters around a plant which had lost virtually every pod. All of this is the more remarkable given the astonishingly short time it takes for the seed pod to mature after fertilisation; I would put this at four to seven days, an observation I took repeatedly due to my initial disbelief in my own records. During the drying process the pod and style elongate to an astonishing degree, until they protrude far beyond the remains of the flower, which still has traces of blue clearly visible. This behaviour is common to all three species, but is especially pronounced in the tiny *G. nepalensis* which elongates to an extraordinary 4 cm, four or five times its



Fig. 84 *Gentiana depressa*, Hinku Valley, Nepal (p273)

Richard Hancock

Fig. 85 *Gentiana nepalensis*, Honggu Valley, Nepal (p272)

Richard Hancock





Fig. 86 *Primula kingii*, at Ascreavie, 1966 (p280)

Stewart Mitchell



Fig. 87 *Lilium sherriffiae*, at Ascreavie (p281)

M. & H. Taylor

Fig. 88 *Cyananthus sherriffii* (p281)

M. & H. Taylor





Fig. 89 *Rhododendron anthopogon* 'Betty Graham' (p281)

M. & H. Taylor

Fig. 90 *Saxifraga sherriffii* in W. Buchanan's garden, 30 April 1962 (p282) William Buchanan



original length. This species is especially difficult to collect as the pod opens from the top quite explosively as soon as touched. The other two have pods which split down the sides and are much easier to handle.

Since my return home I have consulted a very knowledgeable friend on the likely pollinator; and while he discounts the following due to my negligence in not bringing him a specimen grub (I forgot to pack any formaldehyde and the only alcohol available was a precious bottle of Highland Park malt for which better uses could be found than pickling maggots!) I think his observations are of value. He states that the pollinator is almost certainly a tiny diaphanous fly of the order Diptera, a two winged insect capable of rapid reproduction producing several broods in a season and whose grubs pupate in the soil. Apparently the eggs hatch in a matter of a day or two and the grubs will feed well on the protein rich seed, so enabling a rapid life cycle. These insects are familiar to us as the clouds of gnats and midges which appear on warm, still days. Fortunately nature ensures a balance and does not permit the insects to destroy all their host plants. All this convinces me that we really know very little about the mechanisms by which plants reproduce themselves, given that most need the intervention of an outside agency.

In spite of these setbacks a good seed collection was made, for preference of slightly 'green' pods given the time needed to get it home, and has been distributed to a number of competent hands, including some specialist nurserymen. Perhaps this may even lead to forms fertile in cultivation, as much of the present stock of both *G. depressa* and *G. ornata* have been repeatedly propagated from cuttings from small numbers of introductions.

The one curiosity for which I have no explanation is that in the Hinku valley the gentian is always *G. depressa*, while in the Honggu, exactly parallel and no more than 5-6 km apart in a straight line the gentian is always *G. ornata* – the two never meet. George Smith describes *G. depressa* as a weed of the upper cattle pastures and this is true of the Hinku which is grazed every summer. The Honggu is no longer grazed at all, and this is very recent; a massive landslip just above the village of Gudel has destroyed the southern access to the valley, apparently within the last five years. Certainly there were the remains of former stone huts near Base Camp. This is too recent to affect the flora, so if anyone could offer an explanation, I would love to hear it.

The mountain? Oh yes, we achieved the first British ascent of Chamlang (7319m, 24,012') as well.

Ascreavie, the Garden of George and Betty Sherriff

MARGARET AND HENRY TAYLOR

To reach the garden gate drive uphill through trees and rhododendrons with a background of the wide expanse of the Grampian Mountains. This was the approach on a charity open day around fifteen years ago when Ascreavie was the outstanding garden in Angus. On the first Sunday in June the daffodils were still in flower by the roadside as this is a cold site 290m above sea level and well inland just north of Kirriemuir. Maybe Himalayan high altitude plants grew particularly well here because of the cold site.

The house and garden has changed hands several times since the death of Betty Sherriff in 1978, so we begin our story of Ascreavie with a certain afternoon in early June when we entered the garden for the last time.

Gingerbread and *Primula kingii*

We formed an enormous queue waiting for the gate to open at 2 pm. Then came the stampede round the back of the house and up the slope to the plant stall. *Primula kingii* and other rarities went to the fleet of foot. Oh yes, and strong elbows were needed to push through the gardening elite drawn to these tables. All gone, Ascreavie on its cold dry hillside is a difficult site. Any garden is a living reflection of its owner's enthusiasms, so when the owner goes the reflection rapidly fades.

Back to our open day. Dogs and children careered around and through the flower beds. Red-necked freshly-scrubbed farm lads in Sunday best rolled with heavy-booted gait beside plum-in-mouth aristocracy. Fanatical plant pilgrims crouched with camera beside *Rhododendron proteoides*. "What's he photographing, Ma?" "Leaves." "Brown leaves!" Folk picnicking on the lawn. A very tolerant good-natured lady, Betty Sherriff. We remember George Sherriff less clearly as he died many years before his wife.

She mingled with the crowd ready to answer questions, very nice with it and certainly tolerant. Armies of us used to invade her house for tea. It was well worth a day's journey just for the delectable home baked gingerbread! Tea was also an excuse to go upstairs to the toilet and on the way admire Tibetan prayer flags and tapestries on the stairwell. An

excuse to wander room to room studying plant photos and flower paintings. Many of these are now held by Edinburgh Botanic Garden, where they are regularly on show.

Ascreavie was a pleasant good-natured sort of place where the sun shone, you can see it in our photos! Though maybe these only prove our tendency to keep the camera under wraps in wet weather. The garden was on a slope facing south with lawns and paths leading through banks of rhododendron and meconopsis. Everywhere meconopsis in shades of blue, pink, yellow and white, with primulas in the damp area around the little pool and stream. *Primula kingii* used to flourish by this stream with its roots in water (Fig.86, p.275). It was introduced from the Himalaya by Ludlow and Sherriff and Ascreavie was the only place where it grew really successfully. Every year David Smith, the gardener, potted up plants for the sales table. Where are they now? Ascreavie suffered a few seasons of summer drought when all available water was required for the farm animals. The stream dried up and the chestnut-red bells of the primula are now only a memory.

In the dappled shade of deciduous trees the blue poppies were magnificent and favourites of Betty. In Fletcher's "A Quest of Flowers", an authoritative account of Ludlow and Sherriff's plant collecting expeditions to the Himalaya, there is a far-fetched story of Betty finding a specially good blue meconopsis from directions given to her in a dream. You know, the kind of romantic story that appeals to women! Betty Sherriff's "Dream Poppy" is certainly an excellent blue and used to grow by the wall of the house alongside the big strong *Meconopsis betonicifolia pratensis* originally introduced by Kingdon Ward.

When the Sherriffs were plant hunting in the Himalaya they had no house in Britain so when they bought Ascreavie in 1950 the plants came from friends such as Edinburgh Botanic Garden, the Knox Finlays of Keillour and the Rentons of Branklyn. One of the magnets for enthusiasts was a stone trough beside the kitchen door. Here in cool semi-shade grew the dwarf purple *Meconopsis delavayi*, until on one of the last open days it was stolen! And at that time this was one of the last plants in cultivation. Fortunately in recent years Ron McBeath has brought back fresh seed from China so it is now safely back in cultivation.

A speciality that gardener David Smith was proud to keep propagating by division was *Meconopsis sherriffii*. This has lovely pink crinkled petals, and growing in a dry sunny bed it used to set good seed. Nowadays it only barely hangs on in cultivation in a few gardens with enthusiasts swapping anthers in an attempt to get cross-pollination and viable seed. But unfortunately meconopsis stigmas only seem receptive for a very

short period so effective pollination is chancy. To get over this, one system is to keep dry anthers in a bottle in the fridge and withdraw them for repeated attempts to pollinate each flower. There is an account in Fletcher's book of the discovery of this meconopsis which illustrates something of the solid Scots character of George Sherriff. From his diary – "A nice meconopsis, flowers are a pretty pinkish wine-red, one on a scape and I don't think more than two to a plant." Whereas this is the account in his English friend Ludlow's diary – "The gem of the collection, rose-pink like the first flush of dawn on the snows."

Sherriffii, Sherriffae, Sherriffiae

Several plants have a specific name commemorating the Sherriffs and wrought-iron images of three were incorporated in a garden gate made by a local blacksmith. On this gate are *Rhododendron sherriffii* (named in honour of the finder George Sherriff), *Primula sherriffae* (named after George's mother), and *Lilium sherriffiae* (found by and named after Betty). The rhododendron has small rounded leaves with a distinctive chocolate-coloured indumentum. The strikingly beautiful long-tubed primula is really a greenhouse plant having been found at relatively low altitude, thus doubtfully hardy in Britain. Seed of *Lilium sherriffiae* is still occasionally distributed but may not be genuine as it is many years since we have heard of anyone seeing this brown flower speckled with gold. (Fig.87, p.276).

One good plant still happily in cultivation is *Cyananthus sherriffii* which has silvery hairs on the flower bud followed by pale sky-blue flowers (Fig.88, p.276). This is currently available from at least one nursery. Propagation is easy from cuttings taken in June. If taken later in the season, the small plants, though well rooted, may not form rosettes capable of overwintering.

Another very good rhododendron, which has been raised from seed collected by the Sherriffs, is a deep pink form of the aromatic-leaved *R. anthopogon*. This has been given the cultivar name 'Betty Graham' by the seed raiser, Cox of Glendoick, to commemorate the maiden name of Betty Sherriff (Fig.89, p.277).

On the demise of Ascreavie, Dundee Botanic Garden managed to save and rejuvenate some of the rhododendrons, but recent dry summers have been a bit of a setback.

Saxifraga sherriffii

Seed was collected as L & S 18972 in May 1949 at 3750m on cliffs near Pangotang in central Bhutan. When I started compiling notes about Ascreavie, I wrote to Doreen Golder, curator of our SRGC slide library, asking if she had slides with Sherriff as a specific name. Doreen found this exciting saxifrage slide. If we can persuade our editors to publish, this could be the first colour picture ever printed of a very rare plant (Fig.90, p.277). The inscription on the slide mount reads, 30 April '62

W.B. We are fortunate to have this photo as 'Willie' Buchanan (W.B.) died in 1963 and, as far as I can trace, this saxifrage is no longer in cultivation. In the SRGC Journal for September 1959 there is a note written by Frank Ludlow mentioning that the botanist Dr Harry Smith, who first named a herbarium specimen *S. sherriffii*, was surprised to find a Himalayan so closely related to the European Aretioidea group of saxifrages. Ludlow also congratulates Willie Buchanan on his achievement in raising this and other rare plants from seed.

Back to Ascreavie and the nomocharis and lilies which were a feature of the garden. There were drifts of *Nomocharis aperta*, *N. saluenensis* in a deeper pink with distinctive purple anthers and scattered plants of the speckled and fringed *N. mairei*. Beside the sunny south-west facing house wall was a tremendous bed of the deep pink *Lilium rubellum*, whereas the pale pink *Lilium mackliniae* grew in the cool shade of trees. Also in the shady woodland peat beds were paths bordered with *Primula flaccida* and *P. reidii williamsii*. This is one of the few sites where we have seen the latter flourishing outdoors. In a more sunny position one of the breathtaking sights was a cloud of the snow white *Primula wigramiana*.

Another feature was the dry retaining wall behind the house where incarvilleas flourished, including the very compact *I. younghusbandii*. This is a Tibetan plant collected by L & S in mountains east of Lhasa and another probably now lost to cultivation.

Om mani pedme hum

This is a powerful Tibetan Buddhist prayer used in a splendid BBC video called "A Dream of Poppies" which features Ascreavie in its heyday. The video is intercut with scenes extracted from unique 16mm colour film of life in Lhasa taken by George Sherriff when he was British Resident from 1943 until 1945. The BBC video has an informative and amusing commentary by Magnus Magnusson and others including Sir George Taylor, who had accompanied Ludlow and Sherriff on an expedition to Tibet. It shows a lost world of Tibetan life, customs and flowers.

Lost at present, like *Primula kingii* and *Saxifraga sherriffii*. These are two for you energetic plant collectors of the future, and who knows what further treasures may emerge when Tibet again becomes accessible.

*Addendum: While watering the neighbour's garden in late May, we found a perfect, genuine *Lilium sherriffiae* flower, proving it is still alive and flourishing. Some neighbour!

To George Sherriff – a debt of gratitude

ANNE M. CHAMBERS

Like many other gardeners, I owe a great deal to Sherriff – for the happy memories of visits of Ascreavie and for the continuing pleasure of growing his many plant introductions. More than that, without the inspiration of his expeditions to Bhutan, it is unlikely that I would have chosen to botanise there. Bhutan is a Himalayan kingdom little known to outsiders, difficult of access and expensive. In the autumn of 1990 when I was offered a visit to eastern Bhutan, I re-read the relevant pages of Dr Fletcher's "A Quest of Flowers" written from the diaries of Ludlow and Sherriff and immediately opted to join the party. I was so captivated that I returned in the spring of 1992.

George Sherriff was a military man whose professional training and temperament made him the ideal expedition organiser and from all accounts he was, too, a highly regarded companion – this under conditions which could often try compatibility and friendship to their limits. His expedition diaries from 1933 to the last one in 1949 are held in the library of the Royal Botanic Garden, Edinburgh and I am grateful to Colin Will, librarian, for making them available to me. I was curious to read them because, in a very small way, I shared a few of Sherriff's experiences. In the main, the diaries are a reflection of the man – careful, considered entries with a great deal of additional detail. There are records of letters home and letters received, of financial affairs, expenses, rates of pay and final settlements to staff. At the end of one diary there are suggested items to be taken on the next trip. As an officer he appreciated the importance of good planning and provisioning for the comfort of everyone and the success of the expedition. There is one cryptic record – "Three Doz. whisky 1 rum" – the quantity I presume to be bottles, not cases! A good tot of spirits is wonderfully cheering on a cold night as you huddle round a wood fire in a smoke-filled hut or, perhaps worse, outside with rain still dribbling down, wringing the water from your socks and knowing that tomorrow's conditions will probably be at least as bad as today's. Sherriff's whisky came from the family distillery at Bowmore, Islay, according to Sir George Taylor. Nowadays you do not have to import the stuff – Bhutan has its own distillery in the south of the country where whisky, rum and brandies are produced. 'Bhutan Mist' and 'Dragon Rum' may not be the choice of the

connoisseur but they have the same uplifting effect at the end of the day.

Weather conditions, of course, feature frequently in Sherriff's diaries. Bhutan is at the eastern end of the Himalayan chain and has a summer monsoon climate. His expeditions often started in early spring and carried on through the monsoon season into late autumn as he returned to make seed collections. Although the heaviest rains fall from June to September, the other months are far from dry. The range of climatic conditions in Bhutan's mountainous regions is prodigious – the lower valleys are often stiflingly hot and steamy while at higher elevations the cold is severe. Spring weather in Bhutan is best described as too bright too early, a phrase with more than a hint of Scottish Calvinism in it, suggesting that enjoyment has to be paid for. Like Sherriff in the spring of 1936, "mornings lovely, cold but clear, by noon deterioration", our spring mornings were breathtakingly beautiful. By 6 am, the sun's rays were tipping the mountain tops and, by 7 am, when we started walking, its heat was softening the previous night's snow which slid off the branches in wet lumps as we passed. The sky was cloudless, but not for long. By mid-morning pretty little clouds had appeared, by noon it was overcast. Rain came often by early afternoon and in the ascent of just a few hundred feet turned into sleet and snow. In autumn, conditions were different – it rained all day and cleared in the evening hours. Sherriff recorded the end of the monsoon in eastern Bhutan on 18/10/34, the rain had stopped, the leeches had disappeared and he had several "perfect" days, one with 19 degrees of frost at night.

We were slightly more fortunate in the area – our monsoon stopped on the 11th. The effect of all this precipitation on the traveller and terrain cannot be underestimated.

Although we have over half a century of technological advances in protective clothing, in practice it is still difficult to stop continuous rain from seeping everywhere, and to maintain personal hygiene under sub-zero conditions is no easier either. We do, however, have the advantage of modern medicines to avoid or alleviate the problems that plagued Sherriff – the septic leech bites, gut disorders and fevers including malaria that delayed the expeditions for days at a stretch.

Sherriff took with him such technology as was available. To keep in touch with the outside world he had a massive short-wave wireless and in late May 1936, "heard England perfectly, presumably monsoon conditions have made the reception so good. That will be one good thing in favour of the monsoon." Sir George Taylor mentions hearing Neville Chamberlain on 30th September 1938 announcing his agreement with Hitler over Czechoslovakia, and when seriously ill in August of that year, being cheered by the news of Len Hutton's record score of 364 at the Oval.

Today's radios are tiny by comparison but the news often no less consequential. We were astonished in May last year to hear over the BBC World Service that Graeme Souness had been released from hospital following his heart operation and went to bed comforted that nothing more momentous was happening in Britain. We had another wonder of modern technology with us too, but one not available to Sherriff – the portable CD player. It was a rare pleasure on one of our lovely mornings to breakfast at 13500 feet against Chomolhari's magnificent backdrop, listening to Mozart while the yaks waited patiently for their loads.

The Survey of India maps which Sherriff had were often inaccurate or blank in the areas through which he travelled, and he did much work to correct them. There are many little sketches in the diaries annotated with the bearing angles of routes and passes. He was meticulous in recording altitudes wherever he stopped. The expedition carried a hypsometer, an instrument which measures accurately the boiling point of water. The atmospheric pressure can then be calculated and an estimated altitude obtained from tables. As one who never ventures into the Scottish hills without a detailed map, I was especially aware of the inadequacies of my maps of Bhutan. Bhutanese script is, of course, open to the interpretation of the translator and the considerable variation in place-names makes them difficult to relate with certainty to one another. For one pass, I had Nyeli, Nyale, Ngile (an official Bhutanese map), Nyeri (a Japanese publication!) to equate with Sherriff's Nelli La. And quoted altitudes are a similar problem. It was of more than academic interest to me to know whether the Yale La was 15180, 15800, 16000 or 16200 feet, since every step at these heights is taken in apparently lead-weighted boots. But it had to wait for the ascent – two of us had altimeters on the pass and reckoned independently that 15800 was probably the best estimate, but considerably more than Sherriff's value of 15180 feet.

And what of the plants? Bhutan's flora can only be described in superlatives. It is home to many wonderful primulas and rhododendrons – “those two aristocratic orders”, Ludlow called them. Every day provided new thrills, some unexpected, some expected from Sherriff's writings, but exciting nevertheless. On my spring visit which was to the north-west of the country, our first afternoon was spent climbing up to the amazing Tiger's Nest monastery pictured in 'A Quest of Flowers', just for the exercise – Sherriff did it by mule. The common *Rhododendron arboreum* was dotted around and I recognised *R. virgatum*, but the surprise was at the tea-shop. In a vase with other bits of greenery was the delectable *R. edgeworthii*! Unfortunately it had been picked in tight bud,

but the dark green reticulated leaves with their felted rusty indumentum were unmistakable. My excitement was so obvious that I was given a piece of it. It was a great pleasure to find other familiar rhododendrons as we went north up the Paro Chhu valley, *R. hodgsonii*, *R. triflorum*, *R. campylocarpum*, *R. thomsonii* and *R. wallichii*, and one which was not familiar, the epiphytic *R. pendulum*, the white flowers with brown anthers reminiscent of *R. leucaspis* but not similar in leaf. In one area the track went through thickets of *R. cinnabarinum*. All the colour variations were there, intermingled, from the salmon-red of *R. c. roylei* to the creamy yellow *R. c. xanthocodon*.

Pack-animals are rested overnight in clearings in the forest, and primulas especially like the well-manured soil. *Primula calderiana* occurs in spectacular maroon drifts, together with *P. griffithii* and *P. erythrocarpa* (the Bhutanese equivalent of *P. denticulata*), all in a carpet of wild strawberry flowers. Under the shrub layer of *Berberis*, *Piptanthus* and *Viburnum* were other herbaceous plants like *Paris* and *Podophyllum*, and three *Arisaema* species, *griffithii*, *propinquum* and *jacquemontii*. The red seedheads of the genus were very conspicuous in autumn and I had looked forward to identifying them in the spring – Sherriff did not record any arisaema, and since he could hardly have missed them we must conclude he did not consider these striking plants worthy of note. In the forest shade were other primulas, *P. gracilipes* (Fig.91, p.294), *P. geraniifolia* and two more, unidentifiable. No problem in recognising *Bryocarpum himalaicum*, though, the remarkable member of the Primulaceae with fringed bells like a yellow soldanella and leaves like an omphalogramma (Fig.92, p.294).

Above the tree-line between 13000 and 16000 feet is the habitat of dwarf rhododendrons, *RR. setosum* and *nivale*, whose purple flowers were just beginning to break, and the one forever associated with Sherriff, *R. anthopogon*. It must rank as the loveliest of the alpine rhododendrons. The flowers have an air of crystalline fragility but appeared quite unscathed by the sleet and snow and freezing night temperatures. Three colour forms were there, white, creamy yellow and pastel pink, though the pink 'Betty Graham' originated from seed he collected on the Orka La in east Bhutan. In the alpine zone we found the very striking legume, *Thermopsis barbata* (Fig.95, p.296), and the area was not short of primulas either. *P. erythrocarpa*, which has a wide altitude range, diminishes to a few centimetres as you ascend and hides under the cassiopes and rhododendrons to avoid being eaten by yaks, as do monocots like *Fritillaria cirrhosa*. The short grazed alpine turf was studded by a tiny pink jewel of a primula, resembling *P. tibetica* but

smaller (Fig.93, p.295). As Sherriff noted, snow persists in May on the north side of the highest passes, and the Yale La was no exception, but on the south side within a few yards of the summit of the pass, an intensely coloured *P. macrophylla* was already blooming. The screes were dotted with cushion plants too, but these arenarias and saxifrages were waiting for warmer weather. Also in waiting on the hillsides were two species of meconopsis, probably *M. simplicifolia* and *M. paniculata*. I was surrounded by their silver-haired rosettes as I stood looking south down the Thimphu Chhu valley, one of the area's many memorable views. The *Abies densa* forest stretched unbroken as far as the eye could see, in the distance a wonderful recession of cliffs where *Paraquilegia grandiflora* was reported – but I failed to find it. However I did come on a pair of Himalayan blood pheasants in the forest. In addition to plant recordings, Ludlow and Sherriff made extensive collections of birds in numbers which would perhaps concern us today, but reflected the attitudes of their times.

Travel across Bhutan's east-west axis is even more difficult in the autumn. Monsoon rains destabilise the hillsides, the resulting landslips can close the only road for a time and the load of soil brought down by the streams often carries away bridges. But travel delays are not all bad for the botanist since they give unexpected opportunities to look around – wonderful displays of berries and fruits everywhere. The blue-berried *Gaultheria trichophylla* often carpeted the ground under the rhododendrons, and the fat resting buds of *Primula whitei* (Fig.94, p.295) were already formed. The wealth of summer flowers still blooming in October was surprising too – campanulas, adenophoras, aconitums and, most striking of all, magnificent stands of *Primula capitata* in a deep purple, round-headed form, robust in stature.

But our aim was to follow in Sherriff's footsteps into the Mera Valley, and this we eventually achieved with some effort, over the Mindu La. He went over "the Chöling La which is sometimes known as the Munde La", but in a later diary entry he records the Munde La as being "2 miles east of the Chöling La", so it appears he did not take our route and in March the new autumn-flowering pleione that I found there would not be obvious (described in **The Rock Garden**, June 1991). The Mera Valley on Bhutan's remote eastern border he describes as "the prettiest part of Bhutan I have ever seen", and I was not disappointed. The fascinating Bragpa people – "Takpas" – whose economy depends on the yak, were still in residence with their animals. Shortly they would go back over the Nyuksang La to winter them around Sakden. Sherriff admired their thick woollen clothing "like Inverness cloaks" and hats of felted yak-hair

“having tails hanging down in 3 or 4 places round the edge” – to channel the rain!

It was on the Nyuksang La that he collected one of his best introductions, the superb *Meconopsis grandis* Sherriff 600. In July 1934 he put bags over the seedheads of some of the lovely primulas that grow there too, *PP. waltonii*, *gambeliana* and *strumosa*, and returned that October to collect the contents. But, like me, all he got were a few seeds of *Primula glabra* – “all the rest eaten by sheep or yaks, even eaten the bags”, he wrote in disgust. Cyananthus and gentian species grew in spots less accessible to the beasts, and another Gentianaceae too, *Lomatogonium stapfii*. This plant, which has shallow cups of blue petals veined with purple, was unknown to me. I visited the RBG on my return and it was a great thrill to identify it from Sherriff’s herbarium specimen taken on the pass eleven days later than our sighting. Without his apparently infinite capacity to record and collect material our knowledge of Himalayan flora would be so much poorer.

Finally I must also express my gratitude to David Long, Ron McBeath and their colleagues at the RBG for all their help and interest.

Editors’ note: heights are given in feet because this is a comparative article.



Taktsang, the Tiger's Nest Monastery, visited by Sherriff in 1933.

Anne Chambers

The Flora of Alaska's Seward Peninsula: Asiatic Heritage Across the Bering Strait

TASS KELSO

The Seward Peninsula of north-western Alaska protrudes from the North American continent towards its Asiatic partner, the Chukotsk Peninsula (Chukotka) of north-eastern Siberia. For much of the past 100,000 years, the two continents were united here by the Bering Land Bridge. Almost 1600km wide, this "bridge" was more of a platform than a plank. It emerged from the shallow sea floor when extensive Pleistocene glaciation lowered sea level and exposed the shelf below the Bering Strait. Today, the continents are separated by only about 100km of water, much less if we consider the offshore islands straddling the International Date Line: Little Diomedede belongs to Alaska but 5km and a day away to the west, Big Diomedede Island is part of Russia.

Although the Bering Strait was travelled by early explorers, little documentation of the flora there was done until recently. The stormy strait was not a place to linger, with few harbours and only a short time when ice was not a threat. The region remains remote today, accessible only by sea or air, and with a very limited local road system. The largest town on the Seward Peninsula is Nome, population ca. 2000. Other Iñupiaq and Yupik Eskimo villages dot the region, though most are not accessible except by bush plane.

Today the Bering Strait region is a focal point for joint U.S.-Russian biological and cultural studies. An international park called the Beringian Heritage International Park is planned to connect the Bering Land Bridge National Preserve, already part of the U.S. National Park System, with equivalent land on the Chukotsk Peninsula. This joint park will cover millions of acres of arctic wilderness, and enable biologists and anthropologists from both countries to plan reciprocal studies exploring our mutual natural history, resources, and native cultures.

In spite of its northern location, the Bering Strait region has a rich flora. There are several endemic species, numerous disjuncts, and strong floristic connections to the Asiatic mountain chains. Because the Seward Peninsula escaped widespread glaciation during the last Ice

Age, it may well have acted as a biological refugium and source area for the recolonisation of glaciated regions of North America. At least some of the local endemics probably evolved *in situ* during the thousands of years that western Alaska was cut off from the rest of North America by the Pleistocene ice.

Physiography and Plant Distributions

There are four distinct physiographic units on the Seward Peninsula which influence the plant distributions there. These are as follows:

1. The Highlands: the York, Kigluaik, Bendeleben, and Darby Mountains. The highest peaks are Mt. Osborn at 1460m, Mt. Bendeleben at 1180m, and Brooks Mt. at 850m.
2. The Uplands: low hills extending across the peninsula. Elevations range from ca. 30m to ca. 800m. These areas are geologically diverse, and include hot springs and recent lava beds.
3. The Interior Lowlands: valley drainages along river systems, including some large inland marshes. Major rivers on the Seward Peninsula include the Noxapaga, the Pilgrim, the Koyuk, the Kuzitrit, the Kiwalik, and the phonetically beautiful Nugnugaluktuk. Most of the river systems are spawning territory for several species of salmon.
4. The Coastal Lowlands: located in a strip around the perimeter of the peninsula, from sea level to ca. 30m in elevation. This region includes wide sandy beaches, extensive dunes, tidal marshes, and sheer coastal cliffs.

Unlike the temperate latitudes where plant communities form distinctive zones according to elevation, in the arctic tundra vegetation patterns are a mosaic determined by local bedrock, and microscale relief. These factors provide small but critical differences in temperature and drainage which affect how plant species are distributed across the landscape. Much of the terrain is underlain by permafrost, with lowland bogs dominated by species of *Salix*, *Carex*, *Eriophorum*, and dwarf *Betula*. On the Seward Peninsula, tree growth is limited to thin spruce forests (*Picea mariana*) in the east, and small patches of balsam poplar (*Populus balsamifera*) around hot springs in the interior. The most botanically diverse sites are those with good drainage, particularly the upland slopes forming the foothills of the high mountains.

The Seward Peninsula is unusual in its large expanses of carbonate bedrock. Ancient Palaeozoic formations are abundant on the uplands, interspersed with acidic schists. Many of the Beringian endemic plants can be found on gentle carbonate slopes, and their distribution patterns often match the distributions of certain bedrock types. The geographic restriction

of some of these species may be due, at least in part, to the change in bedrock that occurs to the north, east, and south of the Seward Peninsula and the disappearance of low-angle Palaeozoic limestone formations there.

The Flora: Endemics and Calciphiles

Artemisia senjavinensis. This beautiful, non-aromatic sage is restricted to the Bering Strait region, including north-eastern Siberia. It is found on gravelly limestone slopes, where it forms dense woolly clusters with bright yellow flowers. Seed set is often uncommon, possibly because of the windy, dry conditions in which it grows.

Artemisia globularia. The species epithet for this sage is descriptive: the flower clusters are dark “globs” of deep red flowers. It is particularly common on coastal cliffs, but can also be found growing inland on gravelly slopes with *A. senjavinensis*.

Braya spp. Three species of these inconspicuous members of the mustard family are common to the Seward Peninsula: *Braya bartlettiana*, *Braya humilis* and *Braya purpurescens* are miniscule in size, but a reward for crawling on hands and knees over frost boils. They seem to grow together, and finding one species is clue to look for the others nearby. While *Braya bartlettiana* is apparently restricted to the Bering Strait region, the other species link the Seward Peninsula with the Rocky Mountains. In Colorado, *Braya humilis* and *B. purpurescens* are rare finds in the high alpine zone, and on our list of protected species.

Papaver walpolei. This small, yellow or white-flowered poppy was originally believed to be found only on the Seward and Chukotsk Peninsulas. Recently, however, it was found widely disjunct on the north side of the Brooks Range, many hundred miles to the north. While it is rare on the Chukotsk Peninsula, it is common on the Alaskan side of the Bering Strait wherever there is carbonate bedrock. Like most alpine poppies, however, the flowers are fragile, and often lose their petals early from wind or rainstorms.

Erigeron hyperboreus. This endemic Beringian daisy is common on carbonate outcrops. While it superficially resembles the well-known *Erigeron humilis* and *E. simplex* of the Rockies, its larger flowers and distinctive stem hairs with purple-black cross-walls make it stand out to those knowledgeable about tundra erigerons.

Festuca brevissima. This diminutive, and indeed abbreviated, fescue is rare even on the Seward Peninsula, growing only on the most exposed sites along windy ridgetops. It appears to be related to the more common arctic-alpine species *Festuca brachyphylla* and *Festuca baffinensis*. While the latter species extend as far south as Colorado, *Festuca brevissima* has so far been found only on the Seward and Chukotsk Peninsulas.

Anemone drummondii. One of the first welcome signs of spring in western Alaska is the flowering of this striking blue anemone, along with *Saxifraga oppositifolia*. Together they make pink and blue carpets on the hillsides, brilliant against the remaining snowpatches. It is restricted to the Bering Strait area, with a close relative found in northern Alaska in the Brooks Range.

Primula anvilensis. The type locality for this minute *Primula* is Anvil Mountain, just outside Nome. This species is probably a glacial isolate of the more eastern boreal species *Primula mistassinica*, the North American equivalent of Europe's *Primula farinosa*. It has small white flowers, and is exceedingly abundant on the Seward Peninsula wherever moist alkaline soil is found: along streams, roadsides, and on upland slopes. Although locally common, it has not yet been found anywhere except on the Seward Peninsula, one of the few entirely American Bering Strait endemics.

Phlox sibirica. (Fig.97, p297). Although further research may show that the Alaskan members of this Asiatic species complex deserve species status of their own, most botanists still place this species under the name of the Siberian phlox. Its dramatic, almost fluorescent pink flowers may owe some of their hue to the alkaline substrate where this is a common member of plant communities on carbonate outcrops.

Asiatic Species

Species with North American-Asiatic distributions account for almost one third of the Seward Peninsula flora. There are several pathways for migration from Asia: mountain connections that reach as far west as Central Asia and the Himalayas, lowland connections that date back to the landbridge days, and, more recently, maritime connections along the North Pacific coast that stretch south through the Aleutian-Kurile Island chain to Japan. Among the more notable species are:

Oxygraphis glacialis. This unique member of the buttercup family has been found only in a few places on the Seward Peninsula, mostly on the barren carbonate slopes in the westernmost sector. Its pale depauperate flowers appear early, then disappear leaving only the basal leaves. Although no beauty, *Oxygraphis* is noteworthy for its phytogeographic connections to Asia. These populations in north-western Alaska are the only ones known from North America. Other species of *Oxygraphis* appear in the mountains of Central Asia.

Saxifraga spp. The Asiatic affinities of the west Alaskan flora show clearly in the number of saxifrage species there. Among the more unusual representatives are *S. bracteata*, an Asiatic maritime species common along the coast of the Seward Peninsula, *S. eschscholtzii*, a cushion-forming alpine species with Himalayan affinities that appears on acid schists and outcrops in the uplands, *S. nudicaulis*, a spectacular pink and

red lowland species found in wet seepage areas, *S. spicata*, a large, leafy Beringian endemic most common in southern Alaska but disjunct along the south coast of the Seward Peninsula and in warm areas inland, and *S. calycina*, a Beringian alpine species common in rocky places in the mountains. The diversity in shape, size, colour, and ecology of *Saxifraga* here lends support for the botanists who believe that this large genus should be split into several smaller, more coherent ones.

Primulaceae. Members of the genera *Primula*, *Androsace*, and *Douglasia* are abundant in north-western Alaska. Of these, *Douglasia* is a primarily North American genus, represented on the Seward Peninsula by Beringian endemics *D. ochotensis*, *D. alaskana*, and *D. gormanii*. The circumpolar species *Androsace chamaejasme* and *A. septentrionalis* are common on the Seward Peninsula; some botanists regard the eastern Asiatic and North American representatives of *A. chamaejasme* as a separate species, *A. lehmanniana*. In *Primula*, the phylogeographic affinities stretch in many directions. *Primula anvilensis* has its closest connections to the eastern boreal forest. Other North American connections are represented by *P. egaliksensis*, a few-flowered, short-blooming, and thus rarely spotted, species that is locally uncommon but geographically widespread from Chukotka to Greenland. The maritime species *P. borealis* is related to Japanese members of *Primula*; its affinities stretch south to the Sea of Okhotsk. Another species with Japanese connections is *Primula cuneifolia*; our subspecies *P. c. saxifragifolia* appears to be spreading rapidly throughout the mountains of the north-western corner of North America as glaciers retreat. *Primula cuneifolia* spp. *cuneifolia* is limited to the western-most Aleutian Islands, south to northern Japan. *Primula eximia* and *Primula tshuktschorum* are a closely related species pair: the former self-fertile and the latter its probable insect dependent progenitor. In Siberia, their closest relative is the beautiful *Primula nivalis*, found as far west as the Caucasus. *Primula nutans* is another Eurasiatic species just barely touching North America with populations in Alaska and the Yukon Territory. Although common in salt marshes along the west coast, *P. nutans* is quite a rare find elsewhere in freshwater bogs in interior Alaska and the Yukon.

Rhododendron camtschaticum (Fig. 98, p297). In July, the upland hills become pink with this miniature (but large-flowered!) rhododendron. Its specific name denotes its Asiatic home territory; it reaches Alaska only in the Aleutian Islands, Alaska Peninsula, and the Seward Peninsula. Like other rhododendrons, *R. camtschaticum* prefers acid "soil", which on the Seward Peninsula, means only fractured schists with little or no organic material.

Orchidaceae. Although we often think of orchids as residents of warm and steamy forests, the tundra, too, has its fair share. Although not as showy



Fig. 91 *Primula gracilipes*, Bhutan (p286)

Anne Chambers

Fig. 92 *Bryocarpum himalaicum*, Bhutan (p286)

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Fig. 93 *Primula* aff. *tibetica*, Bhutan (p286)

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Fig. 94 *Primula whitei*, Bhutan (p287)

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Fig. 95 *Thermopsis barbata*, Bhutan (p286)

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Fig. 96 *Oxytropis bryophila*, Alaska (p289)

Tass Kelso





Fig. 97 *Phlox sibirica*, Seward Peninsula, Alaska (p289)

Tass Kelso

Fig. 98 *Rhododendron camtschaticum*, Seward Peninsula, Alaska (p289)

Tass Kelso



as the tropical species, tundra orchids are always good finds for those appreciative of floral complexity. There are about nine species found on the Seward Peninsula. Most are familiar North American inhabitants of the boreal regions: species of *Platanthera*, *Cypripedium*, *Listera* and *Coeloglossum* to name a few. Their presence on the Seward Peninsula may go back many millenia, and they probably adapted locally to Pleistocene vicissitudes of climate and post-Pleistocene spread of tundra. The Asian connection is represented by one of the (relatively speaking) most showy tundra species: *Platanthera convallariaefolia*. This species can be found throughout the North Pacific island arc from Japan north through the Aleutians, then makes a large jump to the Seward Peninsula, where it is found only around hot springs. Such jumps provide much intellectual nourishment for phytogeographers, who continue to puzzle over historical or climatic explanations.

Oxytropis bryophila (Fig. 96, p296). This oxytrope forms large mats on stony upland slopes. Formerly regarded as an east Siberian subspecies of the wide ranging *Oxytropis nigrescens*, *O. bryophila* is common in western Alaska. It is easily recognised by the characteristic two-flowered inflorescence.

We continue to make floristic discoveries on the Seward Peninsula. The rugged mountainous interior has barely been touched by botanists, and may yet yield species new to Alaska, to North America, or to science. Increased communication and team fieldwork with Russian scientists provide new insights about floristic similarities and differences between Alaska and north-eastern Asia. At the same time, increased development pressures from oil and mineral exploration are threats to habitats, wildlife, and plant species throughout Alaska. Although lacking the terrestrial oil reserves of Alaska's North Slope, the Seward Peninsula is vulnerable to offshore drilling activity and massive gold dredging operations along rivers and streams.

Our understanding of the biological richness of this region is just beginning, and yet our imperfect knowledge reveals ancient Asiatic lineages and botanical oddities with much to teach us about the intricacies of plant evolution. We hope that our explorations and understanding outpace our losses, and that our appreciation for the Beringian biological heritage of North America will increase as our knowledge increases, so that we may act wisely to preserve this heritage.

Further Reading on the Bering Strait Region

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Chewing It Over

STAN FORRESTER

'*What a mouthful!*' in **The Rock Garden**, January 1987 described the construction of our 0.6ha (1½ acre) garden, starting from a bare field. With nine years of work behind us, it is perhaps time to chew over the results.

I was able to draw on my professional experience for the trees we wanted, largely birch, hawthorn, rowan and elderberry, all pioneering species, with Sitka spruce and Lawson's cypress to provide the main shelter from the gales. Bushes are not that much different from trees, although we needed the help of catalogues and reference books to choose a selection of bushes which we thought we would like and which would be good value for money. We also got a greenhouse and propagator to multiply the bushes from cuttings and to grow plants cheaply from seed.

We look around the garden now and find it difficult to imagine what it was like before we started. We have larch and spruce up to six metres tall, and in recent years they have been growing at rates of a metre a year. We have one tree, a poplar, which I estimate to be almost ten metres to its topmost branches, and the aspen, at six metres, is keeping up with the spruce and larch.

The belt of trees up the roadside is well established with the rowans up to about three metres, and a mass of red berries as I write. The birch and hawthorn are very variable, but the best of the birch are up with the rowans. There is a clump of elderberry about the same height, and strong bushy growths, the flowers fragrant in June, the berries attracting the birds in the late autumn. Both make their contribution to the wine making. The spruce and larch in one corner are now a solid clump, and the cypress by the post office at three metres high have been cut back to give us a tunnel for our path down to the house. The cypress shelter belt for the vegetable garden is going to need cutting to keep it within bounds even though we do not want a close cropped suburban hedge. That will be one of my major winter tasks – and a preliminary job will be checking the Tarpen trimmer I have not used for years.

We have thickets of bushes we can barely push through. Of course, I did intend to plant fairly close for the sake of mutual shelter, and to give us an effect more quickly. I think I overdid it! We are now thinning out

some of the shrubberies, and adding the surplus to the roadside belt to give an understorey of bushes among the trees.

Turning to the rockeries, we were really complete amateurs in comparison with most members of the SRGC.

“Amateur – an enthusiast, one who cultivates a study for the love of it.” Chambers’ Dictionary goes on to add *“not professionally.”* I am sure that even the professional growers in the Scottish Rock Garden Club are amateurs in at least this sense of the term – the ones I know are enthusiasts, just as much as the ‘amateurs’.

Chambers’ goes on – *“often implying that he is superficial, trifling, dilettantish, or inexperienced”*. We plead guilty!

I was first introduced to rock gardens as a boy of seven when we moved to a new house with a sloping garden. It was not much of a slope but the plans included rockeries and dwarf walls to level up a lawn. My father was even more of a dilettante than I am. The rockery was filled up with aubrieta, arabis, *Alyssum saxatile*, and a saxifrage, of which, even now, I do not know the specific name. Occasionally some great new find would be discovered and introduced. The only one I can remember was one of the sempervivums – I can remember it had to be covered with glass sheets to keep off the rain. There were probably many more ‘wonderful’ finds. Dad was certainly a dilettante in the sense that some particular thing would catch his fancy and be all the rage for a period.

For me, one advantage of what we had was that the aubrieta and arabis needed to be cut back from time to time – I had a perpetual job getting greenery for my rabbits. There was no thought of cutting back to keep a compact cushion of the plant – we were simply cutting to keep the rampant plants within bounds.

When marriage, and our own houses were part of life, sloping gardens immediately said ‘rockery’ or ‘retaining wall’. All too often my work required our moving on soon after the construction period, before any real stocking could be done. What was needed was something to give a quick effect, and cheaply grown from seed. I was brought up on aubrieta, arabis and *Alyssum saxatile*! Occasionally, we would find something else among the seed packets in Woolworth’s. We have had a couple of campanulas, a geum, some various saxifrages, and sedums. It had all been very amateurish, at least on the botanical side. I did take pride in the construction aspect of the work, creating the rockery or retaining wall.

The twelfth house of our married life is the one we built for retirement. Retiring a little early, just short of my 58th birthday, we could count on more than our average tenancy of previous gardens – just over three years. A main feature of our planning for retirement was that we would be able to

take our gardening much more seriously. With 0.6ha of garden it would have to be taken seriously.

Rockeries and retaining walls featured in the plans. There was a broken-down drystone dyke bordering the road. Despite my practice on retaining walls, I reckoned rebuilding the dyke was beyond my ability. *Gardening from Which* had an article on building rockeries. This was largely taken up with sources of stone. We laughed as we read it – we had our own source, if we replaced the broken down wall with a fence.

With a career entirely spent in forestry, taking account of the landscape, and creating new landscapes, I reckoned to have something of an eye for planning a garden – a miniature landscape. We had done it three or four times as we were moved about the country. Having spent long days tramping rocky hillsides, I had pictures of how rock outcrops looked. Memories of geology classes explained the structures which lead to the superficial appearance. With several rockery constructions behind me, I had some idea of the problems, of what we wanted to do, and what we should avoid. Beyond sketching in ‘rockery’ and ‘pond’ on the plans, we had not given much thought to what we would grow there. We had only got the bare bones of garden construction under way when we had the good fortune to meet Jim Sutherland. He introduced us to SRGC and, particularly, the seed exchange. We were going to need to grow a lot of things from seed to stock the place.

With the need for drains, we were to build up some areas with retaining walls with our plentiful supply of stone. Our old faithful ‘weeds’, and some new discoveries of similar spreading habit, particularly *Silene schafta* and *S. maritima*, the common harebell and bird’s foot trefoil, *Veronica* (now renamed *Parahebe*) *catarractae*, and even London pride, could be allowed to cascade rampantly. One area, low lying and damp, was built up with soil excavated from the entrance drive, and retained with a rockery built to simulate strata of rock outcropping beside the garden gate. To allow it all to be within arm’s reach for weeding, a rocky ledge of a path runs along about the half way mark. There was one real bog within the garden area, at first impossible even in gumboots, which led to the one change in plans. It was not the spot earmarked for the pond but we dug out the worst of it, heaping the spoil to create a rocky hill rising behind the water. Again there is a rocky ledge round the hill for access, both for practical reasons and to inspect the plants at close quarters.

Our first plantings were the things which grow quickly from seed. You’ve guessed it – aubrieta, arabis, and alyssum. We found other species in the seed catalogues. And friends and relatives rallied to the

project. Christmas presents brought the heathers. Bits from other gardens gave us heuchera, London pride and a lovely little blue primula. (I am such an amateur I have lost the labels and forgotten the variety.) A cheap lot of bulbs gave us *Scilla sibirica*, grape hyacinth, and *Chionodoxa luciliae*.

The first lot of seed from the exchange arrived. Joyce Halley was most helpful dealing with a very inexperienced new member, and interpreted our needs remarkably well. However, our inexperience led us to a great deal less success than we should have had. As the years have gone by, results have been better as far as germination is concerned, but too often we have chosen species which dislike our wet climate. However, we have gradually built up a fair variety of plants in the alpine collection. Unfortunately, dilettante as usual, I have not kept good records of what we tried and what succeeded, and the labels all too often are indecipherable or missing altogether. In some cases, as we scrounged something from a garden we were visiting, we did not even know in the first place the names of what we were getting. Never mind, we say to ourselves, we like what we see, even if we do not know, or have forgotten, what it is.

We are pleased with what we have, but not, of course, satisfied. Who is ever satisfied with the garden they have, even if it is just what they planned in the first place? There is a good spread of spring colour to brighten us up after the winter rains and gales. Little plants pop their flowers out to maintain interest during the year. Larger herbaceous plants add their contribution to the composition in season, and some small shrubs give round the year interest.

I think it was Dobies' catalogue which added *Dianthus deltoides*, *Silene schafta* and *S. maritima* to our range of rampant spreading rockery plants helping to get cover quickly. We found a couple of pink arabis which are not so aggressive as *A. alpina*. *A. rosea grandiflora* gave us a good drift of pink flowers in our early years which attracted much local attention. *A. 'Compinke'* is similar, but less vigorous. It gave Joyce Halley a problem when I sent in some seed – she did not know it and could not find it in her reference books. I presume it is a variety named as a species by Dobies' or their suppliers. Other seeds we found in the catalogue included *Alyssum montanum* as a more compact substitute for *A. saxatile*, and *Helianthemum*, rock rose, which was slow to give an effect but is glorious now. *Ajuga reptans* is one we like, but we have to keep it in check. We were disappointed with edelweiss. The song from *Sound of Music* suggests something rather different to the dull grey things which grew from the packet of seed.

With our experience, finding success with species of arabis, I bought a couple of *A. blepharophylla* in a local nursery. We like them. The following year the seed exchange listed it. We had another success. Another even greater success from the seed list was *Hypericum olympicum*. We had a dozen or two seedlings all sending up a single long shoot. As I trimmed them back to promote bushy growth, I wondered if they would take from cuttings. They did, and sent up single long shoots! We had four or five generations of cuttings before I got fed up planting them out and giving them away. *Potentilla aurea* again came well from exchange seed. In this case it is the self sown seedlings I am giving away. We had bought a plant or two of *Polemonium caeruleum* and propagated it by division and from self sown seedlings. When we saw *P. reptans* in the seed list it seemed worth trying. We are pleased with it for the rockery – *P. caeruleum* is too tall and is confined to the edge of a shrubbery.

We have one mystery from the seed list. *Anagallis monellii* (*A. linifolia* var *monellii*), is listed in our book as a perennial, and a foot high. What we got was a low creeping plant and we have lost all the originals. However, it is seeding everywhere, even in the sand of the cold frame. It has all the characteristics of being an annual. Has somebody sent the seed exchange *Anagallis indica* wrongly labelled? We are not worried – we like the tiny blue flowers in the creeping strands of the plant.

We have had several happy visits to Jim Sutherland in the nursery he was planning when we first met him. Often on our way into Inverness or on our way home we look in to see how he is doing and spend £10 or £20 on a few plants new to us. On one occasion I told Jim we had a £15 cheque as a present to spend on the garden – what could he sell us? It was a good move leaving him to choose, as he sold us things we would not have thought of for ourselves, including the tiny *Aquilegia flabellata nana*, the little yellow *Douglasia vitaliana*, and a potentilla now without a label to tell us the species.

Checking on the labels which still exist I find *Geranium traversii*, *Frankenia thymifolia*, and *Veronica* ‘evergreen’, (whatever species that is), some of the plants we have got from Jim Sutherland. We have *Heuchera sanguinea*, one of the names I can remember, scrounged from some relative or another. Our four leaved clover was also a scrounge, and we hear that we need to give it back, the original has been lost. No problem, ours is spreading well. The low growing purple broom came from the same source, and has spread well to give us plants for other areas. The *Sorbus reducta* with its unusual pink/red berries was a purchase at a local garden opening.

One garden visit was to new-found friends. They had several creeping plants with variations on a grey theme. They just about qualify as weeds, but, as is usually the case with rockeries, we have corners where we can let them have their heads. By chance we put a completely different plant with the same need for room in just the right place. A corner of the pond rockery is solid with *Iris forrestii*, the progeny of just two plants bought seven years ago.

We have our scented corner, with *Thymus vulgaris*, *Thymus serpyllum*, and a creeping golden thyme, backed by rosemary and verbenas in the adjacent shrubbery.

The heathers, Christmas presents years ago, are used on projecting bluffs in both our rockeries. Kept well cut back they are bushy growths, enhancing the shape of the underlying strata. One collection is simply variations of colour in *Erica carnea*. The other is a wide range of colours and shapes, cultivars of *Calluna vulgaris* with species and cultivars of *Erica*. Included is *Daboecia cantabrica*, not strictly a heather but providing a good bush with gorgeous flowers, and a more upright shape to balance the heathers. One of the *Erica* species, *E. vagans*, is a reminder of my only irreconcilable argument in my whole career with the Nature Conservancy. My opposite number in the Conservancy, with whom I was discussing forestry possibilities on the Lizard Peninsula in Cornwall, was an old friend. The area is the only place in Great Britain where the Cornish heath grows in the wild. I granted that conservation was important. Could conservation not spare 10% of the area for productive forests on this wide windswept heath? We could not agree, but we did remain friends.

Primulas are a fetish with many SRGC members, and I have admired the show of them in gardens like Inverewe and Crarae. They were something we were going to have at Acarsaid. An early purchase for the rockeries was *Primula rosea*, which has been divided time and again to give a good drift of plants near the pond. I think Joyce Halley was throwing out primula seeds at the end of the season in our first year of membership. We got great quantities of about fifteen species. I took great care of the delicate little seedlings – and lost most of them through overheating in the greenhouse and frame. The seeds a neighbour scattered between his rhododendrons came up like grass, and I managed to replace much of our loss. They have been slow to develop well until our trees and bushes provided the right environment on what was originally an exposed garden. We have a great variety now. The only trouble is that I could do with an expert to come and identify them!

“Finished? Of course we never will be.” I wrote that in 1986. I was

fully aware then how true it was of our garden – of any garden. However, one thing which has been so satisfying, is the way our initial ideas, our earliest plans, our whole concept have progressed along a fairly steady path. We have of course had the satisfaction, the enjoyment, of the development of the garden, both the doing and the result. All we say now is that we want more – more of this, more of that, more of these, and let's have some of those too. We look around, and select from what we see to add to what we have. With 0.6ha, we still have areas to which we can add plants and bushes, even a tree or two, within the framework laid down nine years ago – the skeleton which has remained the same framework throughout.



Alchemilla alpina

Joyce Johnson

Beyond the Great Basin: California and Oregon 1992: Part II

MIKE AND POLLY STONE

Many mountain excursions leave the plant hunter with one particular over-riding impression: immoral primulas on the Bernina, snowfields of *Ranunculus glacialis* above Lac Savine, or the studies in gold on the White Mountains. Here, north of Lake Tahoe, it was a tapestry of violet, blue and silver, woven in linum, penstemon and, pre-eminently, lupins. Most authorities refer to the perennial blue linum of the West as the Eurasian *Linum perenne*, as either subspecies or variety *lewisii*. The Old World plants show dimorphism, the styles can be longer or shorter than the stamens, like pins and thrums in primulas whereas American plants are all long-styled. Populations vary enormously in stature, from 10cm in the glaring limestone screes high in the White Mountains, to over 60cm in the lush Sierra foothills. The form here present was intermediate, with more or less decumbent stems of around 20cm and excellent bright blue flowers. We thought this a more desirable garden plant than the tiny, somewhat duller form above the bristle-cones.

Some degree of taxonomic uncertainty also afflicts the local population of *Penstemon speciosus*, since the most recent work, Intermountain Flora, discards *P. s. ssp. kennedyi*, the name given in Munz to the smaller, higher altitude, populations with longer, thinner calyx lobes. Be that as it may, the plants on this ridge were horticulturally distinct, with glaucous foliage and of prostrate habit. Although just coming into flower, they unfortunately appeared to have been frosted! Our disappointment was somewhat tempered by some magnificent mats of the equally widespread *Penstemon heterodoxus*, their rich purple spikes so dense as to make the old cliché about hiding the foliage applicable. This is the local representative of the Procerus group and should not be confused with the taller, blue *P. heterophyllus*, a member of the Saccanthera section.

One of the problems, or pleasures, of plant-hunting in the American West, depending on how one looks at it, is the naming of one's finds. In the Alps it is all too often a question of: if this is Monte So-and-So, then it must be *Primula daonensis*, not *P. hirsuta*! This kind of detailed information is seldom available out West, although there are a few local floras

and plant lists. The latter can be, in our experience, somewhat unreliable. One does not always have the time or the inclination to work right through the key in the regional flora; for example, I consider life too short for tackling the complexities of the medium-sized silver lupins. The extremely variable *Lupinus argenteus* aggregate alone has several pages of synonyms! It is perhaps fortunate for the writer that this frequenter of xeric habitats is of less interest to rock gardeners than the smaller, more alpine *Lupinus breweri*, and *Lupinus lepidus*, in particular its variety *lobbii*. Occasionally found, as here, growing together, they can usually be distinguished by their growth habits. *Lupinus breweri* forms low mats of silvery-green, the racemes standing like candles on a cake. *L. lepidus lobbii* has a central hub of similar foliage, from which spread horizontal stems lacking cauline leaves. These turn up at the end to carry the racemes of violet-blue, often appearing silkier in bud than those of *L. breweri*, which are of a darker violet, and also less obviously bi-coloured. These characters are not however invariable. There is little if anything to choose between them in horticultural merit. Both are short-lived in our experience, rarely flowering more than twice. For the sake of completeness, it is worth mentioning that Intermountain Flora segregates *Lupinus tegeticulatus* from *L. breweri*, said to differ in its tufted, rather than mat-forming habit, with unbranched stems.

As we returned down the track we pondered the convention which makes these small lupins scree or alpine house plants, whereas in the wild they are frequently the ground cover under conifers. We intend trying both beside the self-sown *Lewisia cotyledon* at the base of a Caledonian pine. There followed the longest afternoon drive of our visit, the 370km from Lake Tahoe to Mount Shasta. This was easily accomplished in less than five hours; and we found it far less tiring than traversing a much shorter distance nose to tail in the Dolomites last summer.

Some visitors to the U.S. have said that they dislike the long journeys from one mountain range to another. It is indeed a big country out there, but that is a major part of the attraction for us. Having spent 30 years in the empty Highlands of Scotland, we are not in the least intimidated by the vast open spaces. It is amazing how much further it is from, say, Stirling to Fort Augustus, than from Fort Augustus to Stirling! We often have no choice but to drive for hours on the inadequate Scottish road network clogged up in summer by tourists. The real hassles for us are further south however: literally crawling past Birmingham on the M6 on the way to the Warwick Conference, or braving the racetrack of the M25 to visit Wisley on a Sunday. Out in the West, the roads are wide, straight,

and generally very quiet. One can relax, tune in to the local F.M. Rock Station and press the pedal to the metal; or as Tom Petty puts it: "One foot in the grave, one foot on the pedal, I'm a rebel!"

As we moved north and west of Susanville, the tree cover gradually increased again, after more of Fred's favourite sagebrush. It was these marginal coniferous woods which were showing the most obvious signs of stress after eight years of drought. Deserts are just deserts, the sagebrush is designed to cope with many lean years in a row! High in the mountains flowering was somewhat below average, but there was sufficient moisture available to keep the alpiners ticking over. The squeeze was showing in the intermediate forest zones, with many dead and dying trees.

As we approached the isolated road junction of Old Station, there opened a spectacular vista of Lassen Peak in the evening light, framed by tall thin spires of an introduced verbascum. The 3186m cone is either a terminal prominence ending the northern tail of the Sierra, or the most southerly of the Cascade volcanos, depending on one's point of view. Thus it has elements of both the Sierran flora, such as *Phyllodoce breweri*, and also that of the Cascades, like *Eriogonum pyrolifolium* and *Hulsea nana*. We hope to explore this National Park more thoroughly on foot some day.

Stopping for fuel and cold drinks in the tiny hamlet, we were given some home-made "jerky" to try by the owner, a Japanese-American who had been born on a boat on the way to the U.S. Chewing on this thin strip of sun-dried beef kept the driver wide awake for the next hour or so! This was just as well for the last part become somewhat hypnotic, a roller-coaster of a road, arrow straight between fences of tall dark pines. Only the snow-capped bulk of Mt. Shasta, glimpsed now and then through the trees, indicated that we were making progress.

We had arranged a rendezvous with two old friends, Ramona Osburn and Phyllis Gustafson, at a motel in the resort of Mt. Shasta. Although the 4317m peak of the same name dominates the area, it is too young, geologically speaking, to carry a rich alpine flora. The lower mountains to the west are far older and more interesting botanically, so our first day together was spent climbing to their highest point. It was the first time Ramona had been right to the top of this 2750m peak, a tremendous achievement considering she could give the rest of us a quarter of a century! Perhaps it was the added incentive of having along obsessive plant hunters, determined to see every last high alpine. It was a very long day, there was so much to stop and photograph that it was after 4pm

before we hiked slowly up to the summit ridge and ticked off the last plant on our list. There had been interest all the way, starting with the lovely little lavender *Calochortus nudus*, growing in such shady moist conditions as to encourage optimism for its cultivation outside in Scotland. Also growing in damp soil, but in the open by a small tarn was a dwarf shooting star which keyed out as *Dodecatheon jeffreyi* but some of its characters simply do not fit this species.

I am not known as a lewisia fan, but without much prompting from Phyllis and Poll, I had to admit that the small, bodkin-leaved, *Lewisia leana* (sorry Brian, but I prefer the original spelling, its less clumsy) would look rather nice in a trough. Its delicate sprays of magenta-pink would be more suited to the intimate scale than the rather gross *Lewisia cotyledon* strains one sometimes sees in containers. Growing in a sub-alpine situation, on earthy, shaley scree, amongst scattered conifers, this *Lewisia leana* colony was uniformly a much richer colour than the plates in Brian Matthew's book. Slightly higher up on the crest of the ridge, we came across the first of the day's "specials", *Campanula scabrella*, its tufts of little oblanceolate leaves creeping around in the scree after the habit of *C. raineri*; but any similarity ends right there. Instead of the bold, look you in the eye, bowls of the Italian species there are seemingly frail upward facing stars, around 1.5cm in diameter, on leafy stems of around 5cm. Starting a pale lavender, the flowers gradually darkened as we climbed, becoming quite a good violet-blue near the summit. Its constant companion all the way was the rather more flamboyant *Penstemon procerus* var *formosus*, with rich shining heads more to the purple side of blue.

The pussy-paws, *Calyptridium umbellatum* is one of those plants seen everywhere and hence often ignored. It can vary from miserable to excellent; this day frequently the latter, Poll expending many shots on the subtle variations, from white to pink, within the globular chaffy heads (Fig.99, p314). One is never very far from the related eriogonums; without really trying I counted five species on the ridge. There were *E. umbellatum* and *E. ovalifolium* (Fig.101, p315) of course, the more pointed silver-leafed *E. marifolium* (?), the grey-green mats of *siskiyouense*, with its diagnostic whorl of bracts mid way up the scape, and the endemic *E. alpinum*. At last, a singular alpine eriogonum which is very difficult to confuse with any other! The rosettes are large, up to 10cm across and often individual; the orbicular leaves, around 2-3cm long, are brilliantly white-tomentose, staring out from the reddish scree. The rounded flower heads are yellow, but were in tight bronzy bud at the time of our visit.

Confronted by yet another yellow daisy, either in reality or as a written description, it is all too easy for the gardener to switch off, disregarding it as "just another B.Y.C." *Hulsea nana* is one of the select band which does not deserve such pre-emptive dismissal. If I were ever to write an article entitled "Some yellow alpine composites worth growing" it would be near the top of the list, together with cremanthodiums, *Senecio halleri*, *Hymenoxis acaulis*, several arnicas and the smaller doricums. Sometimes it can be difficult to attribute an unknown composite to a genus, let alone the species; consider the various dandelions in the Alps for example. With their pregnant hemispherical involucre and slightly succulent, glandular, oblanceolate leaves, usually somewhat ruffled and lobed, hulseas are, once seen, never to be confused again. We have already mentioned finding *Hulsea algida* in the White Mountains; further north, as on this mountain, it is replaced by the more desirable *Hulsea nana*. The latter is, not surprisingly smaller, usually scapose, with well-spaced ray florets of orange-yellow (Fig.100 p314). *H. algida* is more robust, with cauline leaves and medium yellow rays. (There is an even better plant; *H. vestita* var *pygmaea*, only known to us as a herbarium specimen; next time?).

A stiff breeze cooled the tired plant hunters plodding up the last scree-slope, bringing in broken cloud but fortunately no afternoon thunderstorm. As we crested the final rise, the sun behind us, an incredible view of Mt. Shasta suddenly opened up, across the wooded valley to the east. And there right on the summit was the last of the day's finds, a relic population of *Polemonium chartaceum*. These were slightly larger plants than those in the White Mountains, and, as previously mentioned, differed in having yellow anthers. Time and daylight waits for no-one, so after a brief rest and a few photographs, it was back through the hulseas and penstemons again, past the *Eriogonum alpinum*, and down into the corrie below the peak. While we waited for Ramona to catch up, I wandered across to the last vestigial snowbanks where an exceptionally large-flowered, single-stemmed form of *Anemone drummondii* was turning its white saucers to catch the last warmth of the setting sun. We have been rather disappointed with the various examples of *A. drummondii* which we have raised from the seed exchanges over the past few years. They have been small-flowered, less than 2cm across, and too much like the dwarfer cream forms of *A. multifida*. Weber's *A. multifida* var. *saxicola* from Colorado is one of these. The two species are said to differ in style length, and chromosome number, neither feature of any horticultural significance. On the last weary lap to the cars, Ramona was just too tired for hopping across the

streams on stepping stones and simply ploughed straight through. After a while it became a joke: "Here you are Ramona, another stream to paddle in". One of those vintage hill days to be laid down in the memory thus came quietly to an end.

There followed a little "R. and R.", a couple of days in the same general area. We scrambled up to the granite eyrie of another elfin campanula, Boyd Kline's discovery, *Campanula shetleri*. This looked rather like a cross between *C. piperi* and *C. scabrella*, which combined the flowers of the latter with the habit and foliage of the former. On our way we passed an interesting mixed population of penstemons, including many colour forms of *Penstemon parvulus*, ranging from light lavender blue to pale reddish purple, each set off by black anthers and white signal patches on the lips. This is a smaller, more montane, member of the *Saccanthera* section than either *P. laetus* or *P. heterophyllus*, and one which looked rather more perennial. Staying with beard tongues our last Californian afternoon together was spent above Karangoo Lake in pursuit of *Penstemon newberryi* ssp. *berryi*. This was a long drive round, but only a few miles, as Clark's Nutcracker flies, from our previous marathon, and the plants of *P. newberryi* did not look any different from those around Mt. Shasta. The subspecies is supposed to differ in having included anthers and a slightly wider, pink corolla. I am not sure I believe in this taxon; earlier in the Coast Range, south of Mendocino Pass we had found a population of *P. rupicola* on a high rocky ridge. As we climbed up towards this outcrop some young non-flowering plants seeded down amongst the conifers were lax and green, just like those at home, and had us fooled into thinking they were *P. newberryi* for a while. I should be interested to know where Alice Eastwood's type specimen of *P. newberryi* ssp. *berryi* came from; wishful thinking by a splitter perhaps?

We left California in convoy and drove up to Medford in southern Oregon; where our first stop was Phyllis' Czech-style rock garden. It was around 35°C that afternoon; I must confess to wilting, and retreating onto the shady patio to write up my journal, but Poll stayed the course. As I write this on a cold November day, frozen droplets decorating our shrubs, and mist hanging around the hills, it seems like another world, but one firmly within the broad church of rock gardening. I do remember some rather nice *Origanum*s, a genus which has never been successful with us in Scotland. It makes sense for Phyllis to look to central Europe for parallels in cultivation, although southern Oregon winters are less severe; and to Turkey for her non-native plants, rather than the Alps.

We were actually staying with Ramona and Luke Osburn in their palatial cabin in the woods outside Jacksonville. With humming-birds flitting

around the scarlet penstemons on the rock garden, and several acres of natural woodland where *Fritillaria gentneri* is native, this was an idyllic retreat for a few days. The drought was here too; Ramona's stream, where Chinese labourers once excavated for gold, had gone dry for the first time in many years. While there we were able to visit Boyd Kline, with whom we had corresponded since the old days of Crocker and Kline at Siskiyou Nursery. He is now a keen grower and hybridiser of lilies, especially the *auratum* type. At the Nursery itself, where Phyllis is propagator, we met up with Jerry Cobb Colley and arranged a day out in search of "Boyd's Black Gentian" the following weekend. Many of their frames are protected by high, walk-under fabric shading; something we may have to consider if these hot summers continue.

Steen's Mountain is one of those legendary places whose name inevitably crops up whenever Western plant fanatics gather. Ramona had been wanting to take us there for years. Isolated away in the deserts of south-east Oregon, it takes a full day's driving to reach, so, as Phyllis was working, we elected to take one car, Ramona's Subaru estate. Leaving a three days' supply of Luke's favourite home-made fruit cake, we set off early one morning, bypassing Klamath Falls to the North on minor roads. It was here we saw the "Eat an Owl" sign. Pressing on eastwards the tree cover gradually declines, and Fred's favourite is once again the dominant plant. Crossing the huge tableland of the Hart Mountain Antelope Refuge, Ramona calmly turned her almost new car over to me and dozed in the back. The broad gravel road was quite "wash-boarded" in places, the sort of surface one takes at under 20 or over 50mph, like the Belgian pavé of old. Naturally I chose the latter course. Ever since watching the cult film of the 1970s, "Vanishing Point", I have dreamt of speeding across a desert raising the inevitable cloud of dust high above the sagebrush. All thoughts and stress are suspended in the exhilaration of the moment! Far too soon, with the setting sun at our rear pointing up every rugosity of the landscape, the road dove into the green oasis of Frenchglen with its hotel by the Blitzen River, tucked in under a small escarp.

We were not staying at the small wooden hotel, although we ate there en famille, but rented a large caravan nearby. It is 26 miles of very gradual ascent from Frenchglen to the East Rim of Steen's, passing from the sagebrush steppe-desert, through junipers, to a zone of scattered aspens. Unusually the latter extend to the tree-line, with no further conifer belt above. The alpine grasslands, which start at around 2300m, were once heavily over-grazed in summer, as on the Wasatch Plateau in Utah. The Bureau of Land Management, known always as the "BLM", now controls all landuse, and maintains the dirt road. Some conservation

groups wish to see this loop-road closed, and Steen's declared a wilderness area, but they are opposed by the powerful hunting lobby. We are with the hunters, for most day visitors keep to the road, and once up on top, seekers after solitude can easily walk away, across twenty miles of ridge and table-land.

Although basically a fault-block mountain, Steen's is by no means a uniform tilted plateau. Several enormous U-shaped glacial valleys, over 700m deep have almost cut right through to the scarp, leaving the summit ridge quite narrow in places. The actual summit by the radio towers is 2967m, but much of the rim is above 2800m.

Standing at the lip of Kiger Gorge, or at the crest of the East Rim, with the Alvord Desert 1500m below, one realises how futile it is to attempt the imitation of nature in rock garden construction. Turn to a nearby out-crop and one sees little vignettes which could be copied in the garden. It is on the scale of plants, not ersatz mountains, that alpine gardening works!

The upper slopes of Steen's Mountain are surprisingly green, indicating a substantial rainfall of almost 700mm per annum; even the highest slopes of White Mountain Peak only receive 400mm; but then the way to Steen's for rain-bearing winds is not blocked by the wall of the Sierra. Therefore many of the standard Western alpines are to be found on Steen's; although some, like *Polemonium viscosum*, are very localised. With such an isolated position, a few local endemics are to be expected, and this is indeed the case, including one really special plant. I usually do most of the research, prior to our expeditions, Poll looks after (**all!**) the practical details, such as what will appear (as if by magic) from a rucksack, at lunchtime, on top of a mountain! She usually asks each morning what are we specifically looking for that day. The answer for Steen's was the little grey-brown leaved penstemon we had raised from Ramona's seed which never flowers: *Penstemon davidsonii* var. *praeteritus*. It did not take much finding, plants were scattered on most of the rock outcrops we looked at, all along the rim. As is always the case, the finest flowering individual was too dangerous to approach, on a loose shaley slope, right at the lip of a sheer drop of several hundred metres.

I feel that this taxon is incorrectly placed with *P. davidsonii*, it is at least as distinct from the type as *P. cardwellii* is from *P. fruticosus*. *P. davidsonii* var. *davidsonii* has robust creeping growths with thick blunt green leaves, the corollas funnel-shaped and some shade of violet-blue. *P. praeteritus* is much twiggy, with pointed thinner leaves, and the corollas are larger and slightly constricted at the mouth, giving a somewhat



Fig. 99 *Calyptridium umbellatum*, north California (p309)

Polly Stone

Fig. 100 *Hulsea nana*, north California (p310)

Polly Stone





Fig. 101 *Eriogonum ovalifolium*, White Mountains, California (p309)

Polly Stone

Fig. 102 *Polemonium eximium*, Mount Dana, California (p322)

Polly Stone





Fig. 103 *Eriogonium caespitosum*, Steen's Mountain, Oregon (p318)

Polly Stone



Fig. 104 *Cassiope mertensiana*, Yosemite, California (p323)

Polly Stone

Fig. 105 *Vaccinium nivictum*, Yosemite, California (p323)

Polly Stone



hump-backed appearance. In colour they were of a little more pinkish lavender, but there is not much in it. This variety is not a true endemic of Steen's Mountain; it extends south into Nevada, on the mountains around the Black Rock desert where Britain regained the land speed record.

Another plant which was once regarded as endemic is the local alpine lupin. It had been called *Lupinus lepidus* var. *minutifolius*, another of Alice Eastwood's splits, but Rupert Barnaby in Intermountain Flora lumps it back under *L. lepidus* var. *lobbii*. I concur, for although the Steens plants have smaller, greener leaves than the norm for *L. l. var. lobbii*, the latter is polymorphic and easily encompasses this small variation. Found in stony areas somewhat below the crest, it stained whole areas blue, the finest mass display we have seen of any alpine lupin. Higher in the sparse grassy areas accents of royal blue were provided by *Penstemon procerus*. Assigned to *P. p. var. formosus* these were, like the ones by Mount Shasta, much larger-leaved plants than the form grown in Scotland under the invalid name *P. pulchellus*, with less capitate inflorescences.

As we had come to expect on this trip, the two "Es" were very well represented: *Erigeron* and *Eriogonum*. The local form of *Erigeron compositus* was quite large but noteworthy in presenting both rayed and discoid forms side by side. Erigerons and asters can sometimes be quite difficult to separate in the field; they are distinguished by technical details of the involucre bracts, sometimes called phyllaries, which wrap around the "buds". Most of the *Aster alpigenus* we saw were the robust *A. a. var. andersonii*, often in moist heavy turf with *Darlingtonia californica*. Here on Steen's the variety *A. a. haydenii* is dwarfer, as befits a member of the drier ridge-top herb fields. It is characterised from *Erigeron* by the slightly irregular arrangement of the single row of ray florets.

Naturally there were eriogonums aplenty; *E. ovalifolium nivale*, not quite up to the highest Sierran standards but still clearly demonstrating what a pastiche are most specimens grown under glass. *Eriogonum caespitosum*, another widespread species, was at its best on the rim-rocks; the heads in various autumnal shades, from coppery-yellow (Fig. 103, p316) to rusty-red, blending beautifully with the russet volcanic stones, pitted by outgassing. Below in a shallow amphitheatre, the same colour scheme was maintained. Where persistent snowbanks inhibit the growth of grass, the brown earth was stained yellow by millions of *Ranunculus eschscholtzii* var. *trisectus*. This we thought was an outstandingly good form, much better than those seen in Utah and at least equal to the best that Idaho's White Clouds could offer. In a smaller nivation hollow near the scarp, the ranunculus was mimicked by one of the best

tiny yellow potentillas we have ever seen, not excluding *Potentilla eriocarpa* of the Himalaya or our own *P. verna nana* (hort.). *Potentilla brevifolia* huddled against the boulders, its overlapping tufts of shiny green finely divided foliage, topped by 5cm leafy stems, each with 1-3 good sized golden flowers. Not mentioned by Farrer or Clay, this is a species well worth noting.

Early in the morning, on our way up the loop road, Poll's eagle eye had spotted a gleam of blue, *Gentiana affinis*, still firmly closed in the chill air. We stopped again on our way down, only to be thwarted a second time. The setting sun dead ahead made for tricky driving, but we could linger no more. It had been a very long day on a long mountain, and supper in the sagebrush called.

To keep our date with Jerry and Phyllis we had to head back next day, north this time through the Malheur Wildfowl Refuge. Its muddy creeks, watered by Steen's snowpack, are home to many waterfowl, but without binoculars we could only identify egrets and pelicans with any certainty. At Burns we turned west on the main road, the long drive to Bend reminiscent of the approach to Shasta, only this time it was Three Sisters and Broken Top looming ahead. On the way south to Medford, we detoured into Crater Lake National Park, to see how the hybrid penstemons, *P. davidsonii* x *rupicola* were faring in the drought. There was far less bloom than in 1988 and the grey overcast lake hardly seemed the same place; but here and there the general gloom was dispelled by a reasonable flowering specimen. Beckie's Cafe in Union Creek is nothin' fancy, but the dinner was excellent, the ambience typically American West.

There had been three suggestions for our day out with Jerry. A meet up at Broken Top was discouraged by Boyd Kline, saying it had little to offer we had not already seen. This left two front-runners in the Siskiyou Mountains, one for *Lewisia cotyledon*, the other for "Boyd's Black Gentian". Although the latter involved a much greater ascent on foot, readers will not be surprised at our choice. In the end we made the full 900m ascent to the summit ridge, good training for Mt. Dana!

Travelling in two pick-ups, we parked at the end of the Forest Service track and headed on up the steep trail. Fortunately this soon entered cool woodland, a primary forest which had never been cut, and so possessed of an interesting ground flora. Much of the latter was long gone, but a few flowers of *Phlox adsurgens* lingered by the trackside. This beautiful species is not entirely happy at Askival, for no obvious reason; perhaps we should try it from seed. *Lilium wigginsii*, Wayne's favourite species, was in full flower by a steep-sided creek. At home a stem from Wayne's seed had almost 30 flowers, and we had taken him a polaroid.

Although the Siskiyou are not very alpine, with trees extending to most summits, there are open areas of both rock and grass, some of them no doubt avalanche chutes. The black gentian grew in a thick turfy bog poised on a steep slope, amid massed *Caltha howellii*. We had raised it from Boyd's seed over 10 years ago, and planted it out in what I now think was too a dry spot. My card index, then functional, reads: "Corolla black and dark blue banded, seed given away, then plants died! Pity, very distinct." Unfortunately the flowers here had been damaged by a hailstorm a couple of days previously, but nothing could dampen the thrill of seeing them again. This species keys in Munz as *Gentiana setigera*, but there has apparently been a shuffle of names. What was *G. bisetaea* becomes *G. setigera* and in turn what was *G. setigera* becomes *G. plurisetosa*. Confused? So am I! No doubt there is a paper somewhere, but until I get a chance to read it this singular plant will stay as "Boyd's Black".

Higher up the slope, where the ground was more rocky and broken, a generous scattering of *Pulsatilla occidentalis* held their mini-mops aloft to catch the breeze. The seed was just at the right stage, falling away when touched. Conventional wisdom states it should be sown as soon as possible, but we have found many western Ranunculaceae have seed less inhibited by drying than their European counterparts. Breaking out onto the ridge above, it was now a question of boulder-hopping or pushing our way through manzanita scrub. Both Phyllis and Jerry regretted wearing shorts at this stage! Growing on the occasional gravel patches was an unusual small lupin, *Lupinus lappidicola* with silver-grey foliage and definitely reddish purple racemes, about 10cm high.

The 2150m summit is quite a respectable height by Alpine standards, but here in the Siskiyou groups of sizable trees continued almost to the very top, especially on the sheltered eastern side of the ridge. Amongst the boulders, and even in needle-mould under trees, large plants of *Penstemon cardwellii* showed a few lingering spikes of lavender. On the exposed western, and largely treeless side, denser mats of *Penstemon davidsonii* clung to the upper rocks, giving rise to a range of hybrids amongst the block-scrub of the summit ridge itself.

This was to be our last Oregon summit before returning south to test our acclimatisation in the High Sierra. During dinner back in Jacksonville's woods, a grey fox called to collect melon skins for his cubs from Ramona's large bird table. As shown in the BBC series, "The Velvet Claw" this relatively primitive dog is a competent tree-climber! On the occasions when he "trees" feline intruders, I expect our terrier, Tor, wishes he had retained the same skills. We returned to Mono Lake in

easy stages, breaking up the journey with a little botanising on the way. Carson Pass and HW395 were getting awfully familiar. Poll even took time to photograph a few of the roadside weeds, such as a 2m tall white-foliaged thistle with red flowers, and the prickly poppy, *Argemone*.

Throughout our trip, Mount Dana had hovered in the back of our minds like an end of term examination. Were we fit enough to reach the top? If so, was it too early for the Sierra Sky Pilot, *Polemonium eximium*, to be in flower? And would the weather hold? To allow partially for the last, we had allocated two days, pre-booking a motel in Lee Vining. This was indeed fortunate, for the little town was full of German tourists taking advantage of the exchange rate in their favour.

Passing only a few early morning joggers, we were up on Tioga Pass by 7am. "There is no need to pay to go into Yosemite", said the Ranger in the entrance kiosk, "just park over there, and follow the faint trail through the trees." The Pass was still in shadow, and the frozen grass crunched underfoot, as we threaded our way to the foot of the steep slope. Tioga Pass is at 3030m, and so the thin path winding upward was soon clear of the trees. This slope however, faces west, and so by good fortune we remained in the shade for most of the steep initial ascent. As we climbed, the view opened up; the bright green ribbon of Dana and Tuolumne meadows, bordered by pinewoods, their stygian carpets pierced by the pale granite teeth of the Cathedral Range. The slope eased, the first flowers opened to greet the sun, we were going well and we knew we could make it! In short grass, dissected by a network of streamlets, grew the second smallest Dodecatheon we have ever found, a form of *D. alpinum*: with one or two, 2cm tetramerous flowers on scapes of 10-12cm. An even smaller *Dodecatheon* from the Big Horns of Wyoming flowered at home in 1992 and we were able to key it as a pygmy form of *D. conjugens*. The flowers, only 1.5cm long had the usual five reflexed segments, and were carried singly on thread-like scapes of about 5cm. Both these species are usually much larger, *D. conjugens* up to 25cm tall. The larger meadow and woodland forms of *D. alpinum* have been called *D. a. ssp. majus*, but there is no real cut-off, just continuous variation. Incidentally, a really major shooting star also bloomed this spring, *D. pulchellum* var. *zionense* with eye catching tri-coloured flowers on robust stems of up to 40cm. It came to us as "*Primula parryi*", an easy mistake to make, if the plants are in seed. Conversely, a recent autumn visitor thought self-sown *P. pedemontana* were dodecatheons!

The trail finally petered out by a large cairn on a shoulder at 3540m. Ahead lay a shallow bowl-shaped corrie, bounded by the north-west and

west ridges of Mount Dana. We trended left, taking a longer, but more moderate route around the lip of the corrie. Underfoot the going was generally easy, apart from some short stretches of block scree. A small burn was frozen solid although it was by now after 9am. No wonder the plants are hardy to late spring frosts! There were many familiar faces here, *Eriogonum ovalifolium nivale*, *Lupinus lepidus lobbii*, and *Phlox pulvinata*: and one complete stranger – a grey-green cushion or mat-forming plant dotted with little yellow spherical heads, fuzzy with stamens, on stems of only 1-2cm. The foliage reminded me of a more lacinate *Bolax*, the inflorescence like a much reduced *Lomatium*, so I tried the Umbelliferae (Apiaceae), and there it was: *Podistera nevadensis*. Here's one that the bun-fanciers have apparently missed, a genuine high alpine cushion plant, and it's not in Farrer, Clay, or the seedlist handbook!

Picking our way carefully to the crest of the north west ridge, the ground suddenly fell away in a 300m precipice; at the foot, Dana Lake, of such an intense emerald as to rival even Crater Lake. Beyond the counterscarp lay the table-land of Dana Plateau, with the paler blue of Mono Lake just visible in the distance. Hanging on the north face of the final cone of Mt. Dana, a small relic glacier gave its name to the canyon below; the sort of corrie glacier which would be present in the Cairngorms were they a few hundred metres higher. The next section of ridge comprised jumbled masses of rock, from packing case to house-sized, with crevices between in proportion. A slip here could be serious, forget the view and scramble with care! "Nothing could grow in this", grumbled Poll, momentarily disheartened. A yellow beacon ahead promised another change of terrain; *Hulsea algida* growing in the loose shaley scree of the final slopes encouraged us onwards. On two previous occasions hulseas had presaged our arrival in the domain of a sky pilot; in spite of being at almost 4000m I found myself speeding up. Suddenly there were the first unmistakable tufts of *Polemonium* foliage, but no flowers! The pendulum of our mood swung back to gloom. We knew snowpack had been minimal, but we determined if necessary to search the entire summit area. Our luck was in, here and there plants had one or two globular heads, varying from pale lavender to a really vivid violet-blue (Fig.102, p315). The traveller's tales do not exaggerate, it is well worth the effort necessary to reach the Sierra crest! While lacking the purity of blue which characterises *Eritrichium nanum*, *Polemonium eximium* possibly has an even greater mystique; for after all one can drive to the *Eritrichium*, in both Old and New Worlds.

As we sat and ate our lunch in such august company we could not help

but feel a certain satisfaction in our achievement. At such moments, *Quid opus est verbis?* All fears of failure dispelled, we slithered our way down scree and snowbank, past globules of *Draba densifolia*, to the corrie floor. All in all it had turned out to be a fitting climax to our odyssey beyond the Great Basin. Next morning we drove up to a nearby dam, breakfasted at a small cabin, and took the boat taxi to the far end of the lake. Here a complex of small lochans linked by waterfalls and winding streams, made an ideal playground in which to potter and unwind.

In the early days of the garden at Askival, ericaceous plants were one of our first passions, and we have retained a soft spot for them ever since. It is perhaps therefore appropriate that our last wanderings in high places should be in their company. *Cassiope mertensiana* decorated granite crevices (Fig.104, p317), *Phyllodoce breweri* wove a carpet of deep magenta-pink between the outcrops, supplemented by *Kalmia microphylla* in the damper spots. *Ledum glandulosum* var. *californicum* competed with several willows for streamside living space, but is happy with ordinary peaty soil in the garden. We had seen *Vaccinium nivictum*, the Sierra bilberry in several previous locations, but here at last it was in full flower, pink droplets in the axils of the glaucous foliage. A dwarf species, 10cm or less, spreading by underground rhizomes, it preferred to grow beside, or at the base of, granite outcroppings (Fig.105, p317).

We wandered up the gently sloping boiler-plates to the highest corrie lochan, the last debris-pocked remains of the glacier which had covered this basin clinging to the slopes above. No paths, no people, just brilliant turquoise water, pale granite slabs, and hardy pioneering plants obeying the endless rhythm of the seasons. At such a time, for those of us who learnt our hill-walking skills in the trackless, and frequently mist-enshrouded, peaks of the Scottish Highlands, the Sierra are friendly mountains, as indeed are also most Western American ranges. The nearby krummholtz can tell a different story, a warning for the unwary or overconfident. Blasted by lightning, torn by fearsome winds, and bowed down by winter snow, the twisted trees show that these hills do not surrender easily to man. Gentle summer days are but a temporary truce in the ancient battle of the elements. They also remind us that life up here is right on the edge. Because of this precarious existence *Polemonium eximium* only has the surplus energy available to flower well in exceptionally favourable seasons.

Our 1992 expedition "Beyond the Great Basin" had always carried the mental subtitle, "In Search of the Sky Pilots." No gardener, or plant hunter, can ever be entirely satisfied; each season should be but one more small step up the learning curve. There is no doubt this is a major

component in the alpine addiction. If we get everything we want straight away, what is there to look forward to next spring? Thanks to the generous help from many friends, our visit to California and Oregon was more of a probing attack than a mere reconnaissance. One hit and we're hooked; perhaps you had better sell the house after all Wayne!

Letter to the Editors

Dear Editors,

I am sure that many of your readers will consider *Oxalis* to be the bane of their gardening life. However, as the holder of the National Collection of *Oxalis* for the National Council for the Conservation of Plants in Gardens (NCCPG), I clearly have a rather different view. To me, many of them are amongst the most beautiful plants that are in cultivation.

As part of my collection responsibility, I am researching the genus. This is a task that is complicated by the fact that the genus is not well documented. Thus, I would be very interested to contact any member who has an interest in the genus, with a view to exchanging information and, perhaps, plant material.

Yours sincerely,

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Porophyllum Saxifraga Hybrids

RAYMOND A. FAIRBAIRN

Having gathered together information regarding *Porophyllum Saxifraga* hybrids, with the objective of trying to organise a hybridisation programme for 1993, it seemed a good idea to share my thoughts with other members. To see ahead it is necessary to review the progress made so far. W. B. Boyd must have had no conception of the size of the box he was opening when he produced the first *Porophyllum* hybrids in the 1880s.

A recent sample of *Porophyllum* cultivars revealed that 5% had been produced prior to 1900, 60% were produced between 1900 and 1940, and the remaining 35% were produced from 1950 to 1980. About one fifth were introduced by F. Sündermann by about 1910, and the torch was then taken over by P. V. Prichard in the 1920s, who introduced similar numbers. After the 1939-45 war there was a pause; then in the 1960s H. Lincoln Foster was breeding and introducing new cultivars in the U.S.A., and in the 1960s and 70s many new cultivars were being produced in Czechoslovakia which have only recently become widely available in Britain.

After a long period of relative inactivity, interest has revived in Britain and a steady stream of new varieties is being produced, though it is too early to say whether they will stand the test of time. With this in mind it is not unreasonable to question the need for more, particularly when it is realised that many of the old varieties still have a popular following, and can stand up against many of the new introductions. Fashion needs to be taken into account: a quick look through recent A.G.S. Bulletins shows that the varieties being given Awards of Merit or Preliminary Commendations by the Joint Rock Garden Plant Committee are low growing and very floriferous, mostly with one flower to the stem, with medium to short stems, and the flowers are red, pink or white.

These awards are not a particularly good way of deciding what the public wants, as they only reflect what has been submitted for consideration, and are therefore biased towards the tastes of those that show their plants. Many of the most widely appreciated cultivars have never been submitted for consideration. A brief survey of what is offered by the nurseries showed the colour distribution to be more even-handed with only a slight

preference for red or pink over yellow, white remained a minority, and the preference for low growing tight cushions remained.

The basic raw material available for hybridisation is increasing in diversity as new species become more readily available, but in terms of colour the old species provided a substantial pallet which is not likely to be improved upon. In the past the main sources of red have been *S. stribmyi*, *S. media*, and *S. grisebachii*. These all have large leaves, tall stems, and many flowers per stem. *S. grisebachii* has been used less than the other two species, possibly because its large size may have been regarded as a disadvantage, *S. porophyllum* and *S. sempervivum* have also been used, though much less than may be expected considering their smaller dimensions.

The arrival of *S. lilacina* early in the twentieth century provided a source of red associated with a low growing small leafed bun. A cross with *S. burseriana* yielded *S. x irvingii*. When *S. lilacina* was crossed with *S. x luteo-purpurea* (*S. aretioides* x *S. media*) the result was *S. x anglica*. Because three species were involved, the possibility of diversity was greatly increased, and the rich red from *S. media* was added, yet strangely the yellow from *S. aretioides* has been suppressed. In some of the *S. x anglica* varieties the carrying of multiple flowers per stem, inherited from *S. media*, is evident. Numerous varieties of *S. anglica* have been produced, mainly in the 1920s by Prichard.

Yellow cultivars have mostly been obtained using either *S. sancta*, *S. ferdinandi-coburgi*, or *S. aretioides*. A cross of the first two produced the popular *S. x eudoxiana*, and *S. sancta* x *S. burseriana* gave *S. x elizabethae*. Replacing *S. burseriana* with *S. marginata* gave *S. x apiculata*. When *S. burseriana* and *S. marginata* were crossed with *S. ferdinandi-coburgi* the results were *S. x paulinae* and *S. x borisii* respectively, *S. aretioides* crossed with *S. burseriana* gave *S. x boydii*.

The primary yellow hybrids mentioned cover the majority of yellow cultivars commonly available, and if consideration is given to further cultivars such as *S. x geuderi*, which have been produced by crossing one of these primary hybrids with another species, there are surprisingly few yellow hybrids available with other parentage. This suggests that there is a wide field available for further development of yellow cultivars. One obvious area to be considered is a compact bun without the pointed leaves usually associated with yellow coloration. How to achieve this is another question.

The Himalayan and Asian species offer some interesting forms, in particular they mostly have leaves that have a blunt tip and form compact cushions. *S. georgei* has already been crossed with *S. x anglica* 'Winifred', producing 'Lismore Pink' and 'Lismore Carmine', both very attractive cultivars, *S. poluniniana* has been used to produce a number of hybrids

including *S. x polulacina* 'Kathleen' and 'Tvuj Den' (Your Day). *S. iranica* has produced some hybrids with good compact, crisp cushions, though these are not yet commercially available. Even *S. hypostoma* has produced some interesting hybrids, but these have yet to be assessed for garden hardiness. What is missing is a good yellow; as yet no yellow hybrid of the Himalayan type of saxifrage has become available. Initial trials with *S. wendelboi* suggest that it can be substituted into the hybrid combinations which use *S. marginata*, possibly producing a more stocky cushion, and thicker flower stem. For example, this can be seen when comparing *S. x wendelacina* 'Wendy' with *S. x arco-valleyi* based on *S. marginata*. Assuming that this is the case, analogues of *S. x borisii*, *S. x hoerhammeri*, *S. x rosinae* etc, may all be of interest.

Some pleasant colour breaks have resulted from the crosses of yellow and red species, but others have been a little disappointing, being neither one thing or the other. One of the early crosses of this type was 'Golden Prague', believed to be a cross of *S. x edithae* and *S. ferdinandicoburgi*, produced by F. Holenka in 1961. There may still be some reward pursuing this line of work, but inevitably many of the results are going to be poor, and there is a tendency to get a washed out or muddy flower.

So, where next? The most worthwhile objective seems to be concentration on form rather than colour. The taller growing species offer some interesting challenges, in particular how to improve their flower form, and create a more compact bun. At the opposite end of the range, the small, congested crisp cushions, more suitable for alpine house cultivation, need a lot more work on them. Some other areas of interest are apparent, and these may be divided into two groups: first, further investigation of already known combinations, where possible using more than one form of the species involved, and producing F2 hybrids using F1 plants of known origin. Too many of the available cultivars are of dubious ancestry. Second, the incorporation of newly available or under-utilised species into hybrids.

This view may be considered to be too purist, and to be honest, and with the best will in the world, I do not expect to adhere to the objectives too closely. The temptation to use some of the outstanding plants now available in future hybrids will be too great.

Was it all worthwhile? I think so; it certainly brought to my attention the narrowness of the spectrum of cultivars commonly grown, and highlighted possibilities for the future. My only hope is that in the future hybrids will be screened more carefully to ensure that new introductions are distinct, and better than those already available. In the end I am

confident that Mr. or Mrs. average grower will be able to exert the power of the purse when the professionals fail to filter out the 'not so goods'.

To try to ease the way for others interested to know of the origins of their hybrid saxifrages, what follows is a catalogue of all of the crosses known to me. In some cases, several routes to developing a cross are known, and shown.

POROPHYLLUM SAXIFAGA HYBRIDS

<i>x abingdonensis</i>	<i>S. burseriana x poluniniana</i>
<i>x akinfiievii</i>	<i>S. dinnikii x juniperifolia</i>
<i>x ambigua</i>	see <i>x luteo-purpurea</i>
<i>x anglica</i>	<i>S. (aretioides x media) x lilacina = (S. luteo-viridis x lilacina)</i>
<i>x anormalis</i>	<i>S. pseudolaevis x stribmyi</i>
<i>x apiculata</i>	<i>S. marginata x sancta</i>
<i>x arco-valleyi</i>	<i>S. lilacina x marginata</i>
<i>x benthamii</i>	see <i>x luteo-purpurea</i>
<i>x bertolonii</i>	<i>S. sempervivum x stribmyi</i>
<i>x biasolettoi</i>	<i>S. grisebachii x sempervivum</i>
<i>x bilekii</i>	<i>S. ferdinandi-coburgi x tombeanensis</i>
<i>x boeckeleri</i>	<i>S. ferdinandi-coburgi x stribmyi</i>
<i>x borisii</i>	<i>S. ferdinandi-coburgi x marginata</i>
<i>x boydii</i>	<i>S. aretioides x burseriana</i>
<i>x boydilacina</i>	<i>S. (aretioides x burseriana) x lilacina = (S. boydii x lilacina)</i> <i>S. aretioides x (burseriana x lilacina) = (S. aretioides x irvingii)</i>
<i>x bursiculata</i>	<i>S. burseriana x (marginata x sancta)</i> <i>= (burseriana x apiculata)</i> <i>S. (burseriana x marginata) x sancta</i> <i>= (salmonica x sancta)</i>
<i>x byam-groundsii</i>	<i>S. (aretioides x burseriana) x marginata = (boydii x marginata)</i> <i>S. aretioides x (burseriana x marginata)</i> <i>= (aretioides x salmonica)</i>
<i>x caroliquarti</i>	<i>S. alberti x lowndesii</i>
<i>x clarkei</i>	<i>S. media x vandellii</i>
<i>x degeniana</i>	<i>S. glabella x spruneri</i>
<i>x doerfleri</i>	<i>S. grisebachii x stribmyi</i>
<i>x edithae</i>	<i>S. marginata x stribmyi</i>
<i>x elizabethae</i>	<i>S. burseriana x sancta. syn: x godseffiana. syn ochroleuca</i>
<i>x eudoxiana</i>	<i>S. ferdinandi-coburgi x sancta</i>
<i>x fallsvillagensis</i>	<i>S. (burseriana x marginata) x tombeanensis</i> <i>= (salmonica x tombeanensis)</i> <i>S. burseriana x tombeanensis) x marginata = (petrachii x m)</i> <i>S. (marginata x tombeanensis) x burseriana = (smithii x b)</i>
<i>x finnisiae</i>	<i>S. aizoides x (aretioides x lilacina x media)</i> <i>= (aizoides x anglica)</i>
<i>x fleischeri</i>	<i>S. grisebachii x luteo-viridis</i>
<i>x fontanae</i>	<i>S. diapensioides x ferdinandi-coburgi</i>
<i>x ?</i>	<i>S. georgei x anglica</i>

- x geuderi* *S. aretioides x burseriana x ferdinandi-coburgi*
 = (*boydii x ferdinandi-coburgi*)
- x gloriana* *S. lilacina x obtusa*
- x godseffiana* see *x elizabethae*
- x grata* *S. aretioides x ferdinandi-coburgi*
- x gyoerffiana* *S. sempervivum x scardica*
- x gusmusii* *S. luteo-viridis x sempervivum*
- x hardingii* *S. (aretioides x burseriana) x media* = (*boydii x media*)
- x heinrichii* *S. aretioides x sribmyi*
- x hoerhammeri* *S. grisebachii x marginata*
- x hofmanii* *S. burseriana x sempervivum*
- x homibrookii* *S. lilacina x sribmyi*
- x ingwersenii* *S. lilacina x tombeanensis*
- x irvingii* *S. burseriana x lilacina*
- x kayei* *S. aretioides x burseriana x ferdinandi-coburgi x sancta*
 (*a x b*) *x* (*f-c x s*) = (*boydii x eudoxiana*)
 (*a x b x f-c*) *x s* = (*geuderi x sancta*)
 (*a x f-c*) *x* (*b x s*) = (*grata x elizabethae*)
- x kellereri* *S. burseriana x sribmyi*
- x laeviformis* *S. marginata x pseudolaevis*
- x landaueri* *S. (burseriana x sribmyi) x marginata*
 = (*kellereri x marginata*)
S. (burseriana x marginata) x sribmyi = (*salmonica x sribmyi*)
- x leyboldii* *S. marginata x vandellii*
- x lincolni-fosteri* *S. (aretioides x burseriana) x diapensioides* = (*boydii x d*)
- x luteo-purpurea* *S. aretioides x media*. syn: *x ambigua*, syn: *x benthamii*
- x malbyana* *S. aretioides x diapensioides*
- x margoxiana* *S. marginata x (ferdinandi-coburgi x sancta)*
 = (*marginata x eudoxiana*)
 = *S. ferdinandi-coburgi x (marginata x sancta)*
 = (*ferdinandi-coburgi x apiculata*)
- x mariae-theresiae* *S. burseriana x grisebachii*
- x megaseaeflora* *S. aretioides x lilacina x media x burseriana*
 = (*a x l x m*) *x b* = (*anglica x burseriana*)
 = (*b x l*) *x* (*a x m*) = (*irvingii x luteo-purpurea*)
- x millstreamiana* *S. (burseriana x ferdinandi-coburgi) x tombeanensis*
 = (*paulinae x tombeanensis*)
- x obristii* see *S. x salmonica*
- x ochroleuca* see *x elizabethae*
- x paulinae* *S. burseriana x ferdinandi-coburgi*
- x petraschii* *S. burseriana x tombeanensis*
- x poluanglica* *S. poluniniana x lilacina x aretioides x media*
 = *p x (l x a x m)* = (*p x anglica*)
 = (*p x l*) *x* (*a x m*) = (*polulacina x luteo-purpurea*)
- x polulacina* *S. poluniniana x lilacina*
- x poluteo-purpurea* *S. poluniniana x (aretioides x media)*
 = (*poluniniana x luteo-purpurea*)

<i>x pragensis</i>	<i>S. (ferdinandi-coburgi x marginata) x stribmyi</i> = (<i>borisii x stribmyi</i>) <i>S. (ferdinandi-coburgi x stribmyi) x marginata</i> = (<i>boeckeleri x marginata</i>)
<i>x prossenii</i>	<i>S. sancta x stribmyi</i>
<i>x pseudo-kotschyi</i>	<i>S. kotschyi x marginata</i>
<i>x rosinae</i>	<i>S. diapensioides x marginata</i>
<i>x salmonica</i>	<i>S. burseriana x marginata</i>
<i>x saleixiana</i>	<i>S. aretioides x caesia</i>
<i>x schottii</i>	<i>S. luteo-viridis x stribryni</i>
<i>x semmleri</i>	<i>S. (ferdinandi-coburgi x sancta) x pseudolaevis</i> = (<i>eudoxiana x pseudolaevis</i>)
<i>x smithii</i>	<i>S. marginata x tombeanensis</i>
<i>x steinii</i>	<i>S. tombeanensis x aretioides</i>
<i>x stormonthii</i>	<i>S. desoulavyi x sancta</i>
<i>x stuartii</i>	<i>S. (aretioides x media) x stribmyi</i> = (<i>luteo-purpurea x s</i>) <i>S. (aretioides x stribmyi) x media</i> = (<i>heinrichii x media</i>)
<i>x thomasiana</i>	<i>S. stribmyi x tombeanensis</i>
<i>x urumoffii</i>	<i>S. ferdinandi-coburgi x luteo-viridis</i>
<i>x webrii</i>	<i>S. sancta x scardica</i>
<i>x wehrhahna</i>	<i>S. marginata x scardica</i>
<i>x wendelacina</i>	<i>S. lilacina x wendelboi</i>



Duncan Lowe

Some Thoughts on Bulbs from Seed

JACK BROWNLESS

Over the last few years there has been an increasing interest in dwarf bulbs by alpine growers. The quality, rarity and attraction of plants displayed in sections for bulbs at our shows demonstrates this, as does the number of new books on the subject.

For the beginner, seed is the ideal way to start, although several specialist nurseries offer short cuts to pots full of colour. But be warned! Avoid the expensive *Iris*, *Fritillaria*, *Crocus* and *Cyclamen* – and be patient. Scan the seed list and select the easier species.

When you sow your seed take a 7cm plastic pot (squares are now in – more pots to the area), fill to 10mm from the top with compost (I use 1 part J.I. No.1; 1 part leafmould or fine peat; 2 parts coarse grit sand). Make a hole (10 x 10mm) with your finger in the centre of the compost and pour the seeds in the hole, cover them with compost and add a final layer of gravel. Plunge outside for the winter.

Monocots seem to like company and germinate well when sown close together. After the first year's growth, leave them alone to encourage the next year's growth in the same pot. A light feeding (half strength) of Tomorite "Chempac No. 8." whenever watering helps. In the third year move the young bulbs on en masse to the next size pot using the same compost mix. By moving the compost, bulbs and all, the bulbs and any fragile roots remain relatively undisturbed, and it makes potting on a lot easier too. However, the top amount of gravel should now be increased so that when dormant, the bulbs can be inspected by shaking off the gravel. Checking on the habitat of a bulb often gives you a good idea of water, light and heat required. The books often say "A good baking is needed" But a word of warning! Bake the top of the bulbs, **not** the roots, for in many bulbs the roots stay active all year round.

An alpine house is not essential; bulbs can be grown equally well in a cold frame, with the covers kept on during the summer months, removing them during September when a gentle watering may be given. The covers will then need to be put back on again with good ventilation.

The cultivation of fritillaries varies widely, and it is difficult to generalise. They are however, all autumn-spring growers; that is, their bulbs begin

rooting in autumn, and the plants continue to grow slowly through the winter, until they emerge to flower in the spring. By early summer they have died down again, and at this period they require a little moisture, then leave them dry until September.

They therefore require well-drained sites which dry out to some extent in summer, but not necessarily hot and sun-baked such as, for example, the tulips enjoy. The majority of species are best grown in the alpine house or bulb frame, partly because conditions there can be controlled and protection given from hard frosts in early spring; and partly because they are so uncommon that few people will have enough of them to risk planting out in the open. I do not want to give the impression that they are very difficult to cultivate. On the whole they are fairly easy and a number of species are perfectly happy in the open garden without protection. It often depends on your own particular rainfall and winter/summer temperatures.

I suggest growing from seed those listed below, which are readily available from the seed list. Sow the seed as usual; if the seed does not germinate keep the pots slightly moist until next year, as *Fritillaria* seed often comes up either like mustard and cress or stays dormant until the following spring.

Species for starters – *FF. acmopetala*, *camschatcensis*, *caucasica*, *conica*, *crassifolia*, *graeca*, *kurdica*, *lanceolata*, *messanensis*, *michailovskyi*, *pallidiflora*, *pudica*, *pontica*.

Cyclamen seed should be soaked for 24 hours in tepid water with a splash of washing-up liquid. The seeds will then be nice and plump and pink. Often you can leave cyclamen seedlings in the same pot for up to 3 years.

Although grown in gardens for more than three centuries, it is only in recent years that the dwarf daffodil has had a rise in popularity, and become more readily available. Seed is, of course, a good method of building up a collection and the seed lists now are quite extensive. Most *Narcissus*, I find, prefer a compost of 1 part J.I.3; 1 part peat and 1 of grit-sand with addition of some bonemeal, and prefer a pot-bound condition to flower well. Try these: *N. bulbocodium* (any subspecies or varieties), *N. calcicola*, *N. cantabricus* (Fig.106, p.334). Look for the growing height; any below 15cm are well worth trying.

Of *Galanthus*, the remark "all looking alike" does not follow, on closer inspection, what better than a pot of *G. nivalis reginae-olgae* in full bloom in December. *Galanthus* are better bought in the green and a few specialist nurseries offer some choice plants, but beware - costs are high. Summer snowflakes are much easier. Try *Leucojum nicaense*, *L. roseum* or *L. autumnale*.

I sow all my *Calochortus* seed in 7cm plastic pots filled with a compost made from 2 parts of J. I. No. 1 to 1 part of 'sharp' sand. The seeds are

sown on top of this mixture and covered with 5mm of grit. Pots are plunged in sand in a north facing cold frame open to all winter weather.

Many people transfer pots of newly-germinated seedlings into a south facing frame to give them good light. This can, however, cause premature dormancy leaving tiny bulbs which do not survive well through the next winter. They are better in a north-east or north-west aspect if possible and covered by lights between October – May.

I leave the seedlings in the same pot for two years, but give a weak liquid feed (Tomorite) at fortnightly intervals, whilst in full growth. When the bulbs become dormant, I re-pot them three quarters of the way down 12cm pots filled with a compost of J. I. No. 3 (60%), sharp sand (30%) and grit (10%). These can then be given full sun in the alpine house or frame, keeping the pots just moist until in full growth when they are watered normally.

I have had very good results by transferring the two year old bulbs into a bulb frame similar to that described in 'The Bulb Book' by Rix and Phillips.

Finally, be patient because some species can take up to seven years to flower from seed.

One final comment: My way is not necessarily your way. However this may have given you food for thought, and like the bulbs we all need feeding.



Fritillaria michailovskyi

Edith Clark



Fig. 106 *Narcissus cantabricus* from seed (p332)

Jack Brownless

Fig. 107 *Primula x muretiana*, Val Minor, Pontresina (p339)

Joel Smith





Fig. 108 *Dionysia aretioides* 'Paul Furse' A.M. (p343)

Glassford Sprunt

Fig. 109 *Jaborosa laciniata* P&W6637 (p345)

Ian Young





Fig. 110 *Campanula troegerae*,
Pontic Alps, Turkey (p346)

Michael Almond



Fig. 111 *Crocus abantensis*,
Lake Abant, Turkey (p347)

Michael Almond

Fig. 112 *Campanula betulifolia*, Pontic Alps, Turkey (p346)

Michael Almond





Fig. 113 *Epigaea gaultherioides* (p348)

Ian Young

Fig. 114 *Ourisia* 'Snowflake' (p350)

Ian Bainbridge



A Few More Glimpses of Pontresina

JOEL B. SMITH

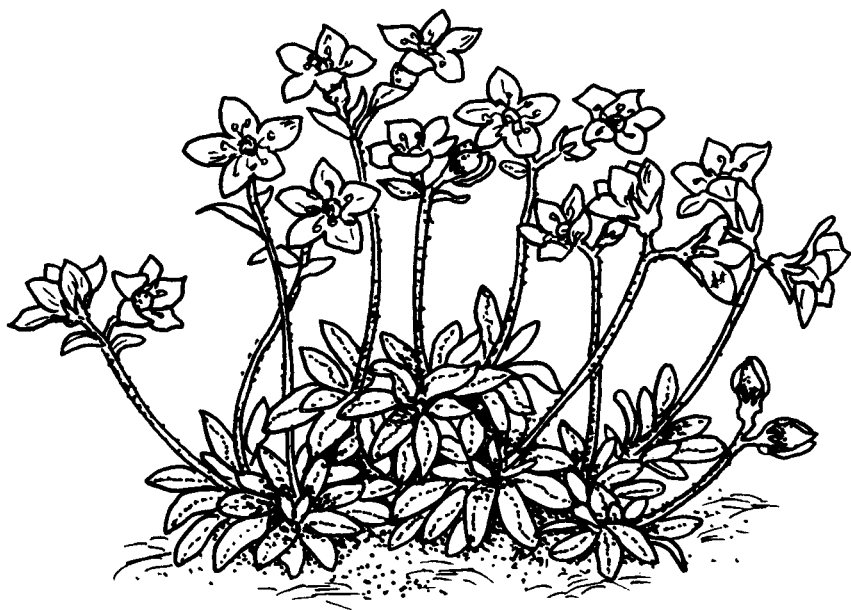
Upon my return from the Dolomites I managed to include a brief sojourn at Pontresina, in the heart of the Upper Engadine.

Ambling past the ragged slopes of the Val Languard, I was soon greeted by the golden faces of *Doronicum grandiflorum* protruding from between the boulders. All along this path, I was met by whistles of appreciation, of course, from the extensive colonies of marmots in this protected valley. Around the tranquil waters of the Laj Languard a few optimistic anglers plumbed the depths for trout. After an amusing encounter with a family of ermine, I reached the desolate scree above the lake, where dazzling mounds of *Silene acaulis* splattered the sombre rocks with an unrivalled abundance of bloom. In the flatter areas the sparkling flowers of *Gentiana brachyphylla* lifted my spirits and it was with great pleasure that I discovered a snowy-white variant of the species growing alongside the turquoise regular form. Also in the scree were the tufted clumps of *Saxifraga moschata* and the curious yellowy-green flowered *Saxifraga seguieri*, a plant all but endemic to the Engadine. Higher still spring was just reaching a rocky plateau and *Androsace alpina* and *Cerastium uniflorum* were just beginning to unfurl their treasures. Further along the cliffs *Saxifraga oppositifolia* was seen tumbling down the moist steep gradients frequented by the odd herd of those majestic beasts – Ibex. On the stream banks below the intense indigo-blue of *Gentiana bavarica* replaced its diminutive cousin gracing the heights.

The next day was fine and presented an opportunity to walk from the Bernina-Ospizio mountain station up to the pass, round the Piz Lagalb and down into the Val Minor. Again the moss campion was in fine form, but one alpine cow begrudged me even a shot of a particularly fine dome, deciding this was definitely a hostile breach of her territory and I was hastily driven away! On the drier limestone slopes of the Piz, the larger flowers of *Gentiana verna* completed the trilogy of species in these ranges. Beneath the Laj Minor on the open expanses of shingle, *Geum reptans* positively somersaulted over any obstacle in a bid to colonise the slopes, leaving the more gentle *Androsace alpina* to the finer shales. I had been admiring the fine forms of all three primulas all morning; *PP. integrifolia*,

latifolia and *hirsuta*, but was rewarded by a large clump of the hybrid *P. x muretiana* (*P. integrifolia* x *latifolia*). The flowers had inherited the lobes of *P. integrifolia*, but the intense pink of the other parent and were born in upright umbels above the sticky upright foliage, providing a textbook illustration of this naturally occurring cross (Fig.107, p.334).

Access to the Laj Muragl was easily achieved by means of a funicular railway to the Muottas Muragl and then a leisurely stroll along a high-level path. Not wishing to make my life any easier on my last day, I gasped and staggered up the alternative path in the valley, mounting the last mound of terminal moraine to gaze refreshingly over one of the most idyllic vistas. Beneath these sheer rugged peaks, lightly dusted, as if deliberately, with a powdering of snow, stretched tumbling scree and then the translucent waters of the Laj. On the flatter bank the white cups of the glacier buttercup swept down to the very water's edge, mingling with many other aristocratic alpins. As I paddled my weary feet, I gazed contentedly at the trout lazily rising on the surface unhindered or untroubled by mankind.



Saxifraga seguieri

Joel Smith

A Plea for Collection Numbers

IAN D. SCOTT

One of the jewels in the crown of the Scottish Rock Garden Club is, without doubt, its seed list. It is a constant source of rare seed or wild collected seed for the amateur grower. This co-operation between collector and an expanding circle of growers ensures that many rare species and varieties do not disappear from cultivation once they have been re-introduced. So, I was rather disappointed to see so little in the way of ex-CLD seed in the 1992-93 Seed List. In fact there were less than two dozen items with any collection numbers out of the 4,000 items listed!

Obviously some plants, such as the *Meconopsis* species, have not flowered yet. Maybe some growers want to build up their colonies before passing on seed. Maybe some growers did not think that it was worthwhile passing on seed of plants already in cultivation. Maybe seed attributed to numbered collections was not labelled to distinguish it from the same seed from other sources. For example I would have hoped that *Primula bulleyana* ex-CLD 193 was listed separately from other *Primula bulleyana* seed.

I can already see the managers of the Seed Exchange reaching for their tranquillisers at the thought of even more work, and overloading them is the last thing I want to do. One thing is clear; the seed exchange managers cannot be expected to cope with a perpetually increasing number of listed items, and at some point we will have to select which seeds are worth listing. When that point is reached I hope that the seed attributed to a collection number will be held in an esteem not too far behind the category of wild collected seed.

Why get so worked up over collection numbers? Well, I have the uneasy feeling that we should be doing more to ensure that re-introductions to cultivation do not fade away, but become permanent. As James Cobb has said, you cannot allow yourself to fall into the trap of thinking of "The Himalayas" as a rather good garden centre just around the corner, where, for a few pounds, you can always pick up another plant if your own one dies. Where are the direct descendents of the plants and seed collected in the 1930s? Few and far between!

Are collection numbers really important, or is it just a case of one-

upmanship? Well, firstly, they do record the achievements of collectors, many of whom collected specimens in the most horrendous conditions, which few of us would tolerate. Secondly, collection numbers can also indicate good forms of a certain plant. (e.g. *Meconopsis* GS 600). But, even more importantly, they should be seen as a resource with high genetic purity. If this is so then they form a bench mark, or a genetic stock, to draw upon in the future. In James Cobb's book on the genus, "Meconopsis", he refers to the hybrid swarms which have resulted from the random open pollination of various species such as *M. grandis*, *M. paniculata* and *M. napaulensis*. Many of these plants are very attractive in their own right, but as a result of random hybridisation the individual species are in danger of being lost. There is the same problem with some of the primulas.

When I first started growing candelabra primulas I bought seed of *Primula burmanica* from a reputable seed merchant. Two years later I removed the plant label from in front of the colony. True, all the plants were candelabras, but the flowers were yellow, orange, cream, pink, red – in fact everything except purple. Some had light green stems, others dark green, others red, some even close to black. Some plants were heavily farinosed, others not. In fact they were a beautiful sight, but not what I had intended. They really were a hybrid swarm, and there are many similar cases.

It was interesting to hear Kenneth Cox recently say that, in Yunnan, they found the two forms of *Primula sino-purpurea* (the normal purple form and the white form, usually called *P. chionantha*), growing side by side, yet intermediates in colour were extremely rare. This is not the case in garden cultivation where intermediate colours are extremely common. Even with the white form the corolla can be white, cream, or tinged with pink or purple. Likewise, the white forms can have a thin blue annulus, which in some cases is so intense that it appears to be black! I assume that these plants are all part of the hybrid swarm of *Primula sino-purpurea/melanops/sino-plantaginea*. Certainly, I have never seen a *Primula melanops* with a proper black eye, even in our botanic gardens. Well, what can be done?

Maybe it is a case of attitude. Some growers have said that the CLD seed collection compared poorly with the EMAK seed collection, because there were less re-introductions in the latter. Maybe the plants were less exciting, but I find it hard to agree with the person who said that CLD 220 was just another *Primula sino-purpurea*. I only hope that a reasonable number of people are maintaining colonies of CLD 220 well away from other nivalid primulas. Commercial sources seem to follow regular

cycles. In the first year after a major re-introduction, there is always a glut of plants, in the second year there are fewer plants and within a short time they are unavailable again. We need to break out of this cycle.

James Cobb has suggested that, for species which readily hybridise, members might be encouraged to grow only a single species, or alternatively only harvest seed from plants which flowered before (or after) others which might have hybridised with them. Those who have larger gardens may well be able to keep species far enough apart to overcome this problem. Obviously there is no such problem if the species do not readily cross-pollinate (e.g. *Farinosae Primulae*).

So, next year label your contributions of ex-collection number CLD indicating that it is not seed from the original collection, but seed from subsequent generations, but only do this if you are confident that the purity has been maintained. In other words I hope that growers will keep their numbered species well apart from other species that will readily cross-pollinate, and not label something as ex-CLD just because it came from a CLD numbered plant.

Please make sure that the seed is correctly numbered. For example, I expect that CLD 357 from this year's seed list should be CLD 351. And whatever is CLD 3236? Lastly, give some information about seed from unidentified plants. What section do CLD 193 and CLD 362 belong to? To know that the first is a candelabra, and the second looks like *Primula secundiflora*, would be very useful to potential growers.

Well, happy harvesting, and next year I am looking forward to seeing more ex-CLD and ex-EMAK seed in the SRGC Seed Distribution list.

Editors' note: CLD – Chungtien-Lijiang-Dali Expedition 1990
EMAK – Edinburgh Makalu Expedition 1991

PLANT PORTRAITS

***Dionysia aretioides* 'Paul Furse' A. M.**

Glassford Sprunt

Dionysia aretioides 'Paul Furse' is one of many forms of *Dionysia aretioides* which is available at the present time. It is derived from seed collected in Iran on the Gulduk Pass in the Elburz Mountains, by Admiral J. P. W. Furse. The species was found growing on the northern slopes of the mountains facing the Caspian Sea, which is some 30km distant. It was found growing in the crevices of vertical or overhanging limestone cliffs, at a height of 650 - 1900m. In its natural habitat it tends to make loose cushions.

Dionysia aretioides 'Paul Furse', by contrast, forms a tight cushion, with much smaller leaves than most of the other forms available at present. The other forms available in commerce tend to be laxer, have larger leaves, often larger flowers and often a flatter cushion. The leaves have a revolute margin with four or five blunt teeth towards the distal ends of each margin. The under-surface of the leaves shows a degree of hairiness and some farina, particularly in the young leaves. The flowers are thrum-eyed and are individually smaller than those of some of the other clones, but what they lack in size is more than made up for in the sheer profusion of blossom. Most of the flowers occur singly on short peduncles but some twin flowers are seen on a large plant.

The illustration accompanying this Plant Portrait shows the plant on the Show Bench at Morecambe in 1992 (Fig.108, p.335). This was one of its less good years, and some of the foliage is still visible. Over 1700 flowers were removed in 1992. It is at present in a 30cm half pot, which it has occupied for about four years. The plant head, out of bloom, measures 36cm across and rises to a height of about 15cm from pot rim level. This year it had 2856 flowers removed following its Show appearances. It performed well enough to gain its second Forrest Medal.

This plant is now about 11 years old, and although it requires re-potting, this activity is fraught with such dangers for the plant that I have decided to leave well alone. It must surely be getting close to its maximum life expectancy.

The plant is kept throughout the year in the alpine house with its pot plunged to about 5cm short of the rim. The ventilators and door of the

alpine house are kept open at all times. This protection keeps the rain off although it has been known for the plant to be covered occasionally with a light dusting of snow.

Care of the plant in preparing it for show purposes centres on:-

1. watering
- and
2. turning the pot.

It is important to be certain that the plant has an adequacy of water at its roots throughout the year. As it is grown in a very sharply drained compost, there is a considerable danger of the compost drying out, not only during the growing season but also in the winter, when one's thoughts are not so geared up to watering. Winds through the alpine house are often very strong and this has a considerable drying effect on plant and plunge.

During the summer watering is, of course, very much more frequent and some protection is given against the worst excesses of the sun by giving some gentle shading. The plant is fed about twice a year with dilute tomato fertiliser.

It is important to start the preparation for the next year's shows as soon as the flowers have been removed in the current year. Perhaps the most important single factor is the regular turning of the pot. During the summer it is only turned about once a month by a quarter turn. From January onwards when the flower buds start forming the turning process is stepped up in frequency, by then it becomes a quarter turn every week. Failure to turn the pot results in the south side flowering about two weeks before the north side.

The only modification to this routine is applied close to flowering time, if it is seen that any segment is lagging behind the rest in the development of the flowering buds. This segment is then given extra time exposed to the south. As the time for showing approaches it becomes more and more important to keep more than a passing eye on the plant's progress, and then the plant is checked at least daily and usually twice daily to make certain that all is well.

Jaborosa laciniata

Ian and Margaret Young

It seems rather odd to be writing a plant portrait about a plant that we know little about but as it is apparently new to cultivation and we succeeded in flowering it, the Editors reckoned we should write something. The seed was collected in Central Chile by John Watson and listed as P&W6637 *Trechonaetes laciniata* (Solanaceae). We had only just

learned how to say *Trechonaetes* when John told us it should be called *Jaborosa laciniata*.

The seed was sown in April 1988 and did not germinate until the spring of 1991 when one seedling appeared. It was repotted, as soon as it was large enough to handle, into a 8cm clay pot and plunged in the alpine house. It grew slowly through the first year and stayed evergreen through that winter. In the spring of 1992 we decided that it should be repotted and put on a regular liquid feed. The plant responded well and the prickly foliage looked very healthy. The deeply serrated pinnatifid leaves, 10-12cm long, including a fleshy-looking petiole of 4-6cm, are about 2-3cm wide and blue-green in colour with a creamy midrib. We were soon pleased to notice tiny flower buds forming at the leaf axils. As the five-ridged green and cream buds expanded, they extended on short stalks, looking very like some campanula buds. Then the first flower opened. It was like a cross between a campanula in shape and a fritillaria in colour. The upward facing campanulate flowers, 3cm across, dark brown inside, green outside with a light cream outline around the reflexing petal edges, had bright orange anthers (Fig.109, p.335). The very attractive flowers unfortunately also resembled fritillaries in their somewhat nasty smell! When at its peak in July it had some fifty flowers open and many more buds to come. Despite regular pollination attempts with a paint brush and though we observed flies and bees visiting the flowers, no seed was set.

The plant slowly died back to a few, almost woody, stalks and we feared it was gone but small shoots appeared around the base and gave us hope. However, the stalks continued to dry out until all that remained above ground was a withered stem. This May we decided to have a look below ground to see if there were any signs of life and much to our delight two healthy shoots were rising from the roots, and these and some others have now reached the surface (late May). We are again looking forward to the wonderful spectacle of the flowers, not too presumptuously, we hope!

All attempts to root cuttings in 1992 failed but we will continue to try to propagate this plant since it is obviously essential to increase stock of these new plants if they are to have any prospect of succeeding in cultivation.

If we are unsuccessful with cuttings or seed this year we will try root cuttings or even consider splitting the plant. We would be very interested to hear from anyone else who has this plant, with a view to the possibility of exchanging pollen.

Campanula betulifolia* / *Campanula troegerae

Lynn A. and Michael J. B. Almond

Although Turkey, and eastern Turkey in particular, is extremely rich in *Campanula* species, *C. betulifolia* and *C. troegerae* are the only two species of the section *Symphyandriiformes* (so called from their similarity to the members of the Genus *Symphyandra*) to grow in Turkey, and both are confined to the north-east of the country.

Campanula betulifolia is found as far west as the road between Giresun and Şebinkarahisar and as far south as Bayburt. In other words, it is confined to the Pontic Alps. It occurs as low as 250m above sea level and up to 2300m. In July, the lowest we have found it in flower is about 1200m, at the monastery of Sumela near Trabzon and in the Barhal valley, above Sarigöl.

The plant grows in crevices in cliffs, usually of igneous rock, and can also be found on the roof of the medieval Georgian church of Barhal. The name *betulifolia* refers to the shape of its leaves (like birch leaves). The buds are usually a dark pink or mauve colour and the flower opens out to a creamy white or, more rarely, pink. The bells are large and, in the better forms, quite wide (Fig.112, p.336). Individual plants can have dozens of flowers cascading down the cliff. The shape of the flowers, as well as their colour, is quite variable and we have seen everything from large, well-reflexed flowers of a creamy white colour to very narrow, quite dark pink flowers. The forms generally in cultivation are by no means good forms compared with what can be seen beside the roads near Ispir and Sarigöl. The form to be found on the citadel at Bayburt, with its narrow bells, more nearly corresponds to the cultivated forms and it is quite likely that the original stock came from there.

Campanula troegerae is confined to a very small area within the range of *C. betulifolia* and grows in similar conditions. In spite of this the plant is very common within this area. We have not seen it in flower as low as the 610m recorded as the only location in the *Flora of Turkey*, as we have only visited the area in July. In mid-July it is in flower between about 1000m and 1700m. Flower size is variable; the largest specimens we have seen measure up to 5cm across. Buds are usually pink. When open the flower is usually white but sometimes retains a pink tinge and occasionally is distinctly pink (in other words, exactly the same colour variation exhibited by *Campanula betulifolia*). The flowers of *C. troegerae* differ from *C. betulifolia* in that the petals are so reflexed that the flower is the shape of a saucer rather than a bell (Fig.110, p.336).

Both of these campanulas do well in a cool scree or a raised bed.

C. troegerae is probably better in a crevice between rocks to give it a little more protection; and in areas of high rainfall it is likely to need a pane of glass over it to protect it. Both also make good alpine house plants. Although *C. betulifolia* is widely available in commerce, if you want to check that you are getting a reasonably good form you should buy it in flower. *C. troegerae* is available from the national collection holders, Padlock Croft Nursery, Cambridge, and Lingen Alpine Nursery, nr Bucknell, Shropshire.

Crocus abantensis

Jean Wyllie and Michael J. B. Almond

My love affair with dwarf bulbs – species crocus in particular – started in my early teens. A friend's garden, in the village in which we lived, had them planted under trees and shrubs and in the early spring they stole my heart.

Crocus abantensis was not one of these. The earliest collection Brian Mathew can trace was in 1969 by Prof. H. Demiriz of Istanbul. It was introduced to cultivation in 1973 by Prof. T. Baytop and other collections have followed. It is still very rare in cultivation but can be bought from a few bulb specialists and seed has been available from S.R.G.C. Seed Exchange.

Crocus abantensis is a spring flowering crocus, April in the wild but February with me. The flowers are blue with a yellow throat (Fig.111, p.336). I grow mine in a cold greenhouse, the pot plunged in moist sand all year (with no summer baking). I repot in summer in a mix of loam, leaf-mould and coarse grit. Vitax Q4 is incorporated in the mix. The pot is two-thirds filled with compost, the bulbs placed on the surface, and topped up with chippings. If the compost is dry I add some water but do not overdo it. Watering is started in late autumn and I feed with a weak liquid fertiliser (Tomorite type) when they are in active growth.

My bulbs have set seed even though I have only one clone. I started with one bulb in the late eighties and now have about a dozen even though I have given a few away to friends. They have not set seed this year because I was not here in February to assist the process, Jim and I were in New Zealand enjoying the pleasures of Mt. Hutt (in the rain) and Arthur's Pass (scorching sun) and enjoying the hospitality of S.R.G.C. members in South Island.

The type locality of *Crocus abantensis* is Lake Abant in north-west Turkey and never having been there I will have to pass you over to Michael Almond.

Crocus abantensis is named after Lake Abant, a small upland lake set among pine forest at a height of about 1100 metres, in the north-west of

Turkey about 150km north-west of Ankara. This is the only locality from which it has been attested. In early April it can be found in flower on the open land below the trees all round the lake, in association with the yellow *C. ancyrensis* and a lilac-blue *C. biflorus*, with neither of which it appears to hybridise. The *C. biflorus* is very similar in colour to *C. abantensis* and the only sure way of telling them apart is to examine the corm; in *C. abantensis* the covering of the corm is “strongly reticulate-fibrous”, whereas in *C. biflorus* it is “membranous or coriaceous with entire or toothed rings at the base”.

Epigaea gaultherioides

Ian and Margaret Young

When *Epigaea gaultherioides* is in flower, many an unsuspecting visitor to our house is ushered out to view this rare beauty. It is much too wonderful a sight to keep to ourselves, and is without question a horticultural highlight in our year when it flowers.

The genus *Epigaea* has three species, *E. repens* from eastern North America, *E. asiaticus* native to Japan and *E. gaultherioides* from around the Black Sea in north-east Turkey and Georgia. As the generic name suggests – epi (on) and gaia (the earth) – they are all creeping plants less than 15cm in height when in flower. An evergreen genus, whose roughly oblanceolate leaves are all similar, in that they are leathery in texture and covered above and below in small hairs, varying slightly in shape between the species.

Of the three, *E. asiaticus* is the easiest in cultivation, unfortunately it is also the least attractive, normally hiding its tubular flowers with reflexed petal tips under its foliage. It grows happily, flowering each year, in our peat bed. We have seen some outstanding compact forms of *E. repens* which hold their starry white, sometimes flushed with pink, flowers neatly above the foliage, sadly we have not yet managed to obtain this clone. This will also grow outside in Scotland although the flowers can get frosted, having been tempted into early growth by a mild spell, like many other members of the Ericaceae.

Epigaea gaultherioides (once called *Orphanidesia gaultherioides*) has beautiful, waisted, widely campanulate flowers, much larger than the other species, and not unlike a rhododendron. Up to five delicate pink flowers, veined with a darker shade, with the quality of purest porcelain are held above the thick leathery dark green leaves on wiry red stems, providing an unforgettable experience when seen (Fig.113, p.337).

The elegant sharply-pointed flower buds are first visible around October, surrounded by a red calyx on a thin red stem all covered in

short hairs. Great care must be taken to ensure that as they slowly develop through the winter, these delicate buds do not fall prey to slugs or the like that would find them a tasty morsel. They come into bloom any time from late February to early April, depending on the season.

The plant illustrated is grown in a compost of leaf mould, peat, loam and sharp sand, the quantities are not critical but an open texture allowing free drainage of water is best.

(A compost consisting of 1 part peat, 1 part shredded turves and 2 parts sharp sand or gravel, with a slow release fertiliser added, forms our basic compost for all containerised plants. For ericaceous plants we mix one part of the basic compost with one part peat or leaf mould, as this improves the moisture holding capacity and reduces the fertiliser ratio by 50% making it ideal for this type of plant.)

The pot is sunk to the rim into a peat and sand plunge bed in a frame that faces due south but is shaded in the summer by a screen. While the frame is covered for the winter the plunge is never allowed to dry out and regular watering is given throughout the growing season with occasional liquid feeds. The cover is removed in April and the frame remains open to the rain until October. Repotting is done around May every second year but an annual top dressing of compost is applied as the roots continually appear at the surface. It is very important that these roots never dry out as this, more than exposure to the sun, is what causes the browning of the leaves so often associated with this plant in cultivation.

Fresh seed, when available, is the best method of propagation and if sown immediately should produce a reasonable crop of seedlings, but like other choice Ericaceae they are not easy to raise to maturity. They require constant monitoring to ensure they do not dry out or get eaten by slugs. The sphagnum method of seed raising described in *The Rock Garden* No. 90 is suitable for *Epigaea* species. We have failed to obtain viable seed in the past by selfing the plant so this year we sought help from a friend who sent us pollen; lovely fat seed pods fill us with hope!

Cuttings are also possible if taken in late summer and put in a peat and sand or perlite compost and covered with a thin polythene film (cling film is ideal) that actually touches the leaves. Keep the cuttings in a frame or glass house making sure they never dry out and with luck some should have rooted by late spring. If you have a mist unit then soft cuttings can be rooted if taken in May or June.

This plant will continue to remain rare because of the difficulties in propagation and the scarcity of plants in cultivation but it is such a beauty you should always be on the look-out in the seed lists and it does occasionally appear in some nurseries that advertise in **The Rock Garden**.

You will have to be quick to secure one of these treasures and if you are lucky enough to get one it will probably be quite tiny but, if ever a plant was worth the wait to obtain and then grow to flowering size – this is IT!

***Ourisia* 'Snowflake'**

Ian Bainbridge

Ourisia is a genus of some twenty-five species in the Scrophulariaceae, widespread in the southern hemisphere, from South America, the Falklands, Tasmania and New Zealand. The genus is named after Governor Ouris, a one-time governor of the Falklands. Some members of the genus are quite well known to rock gardeners and have been in cultivation for many years. Not much hybridisation has been undertaken in the genus, but the pink *Ourisia* 'Inverewe', and the white *Ourisia* 'Snowflake' are two which suggest there might be room for further experimentation.

Ourisia 'Snowflake' is a white-flowered hybrid which, I understand, originally emanated from Jack Drake's Nursery in the Highlands. Its parents are both of New Zealand origin, as are many of the white ourisias in our gardens. (The red ones, which are probably pollinated by hummingbirds, tend to come from the Andes, where the hummingbirds are!) One parent is *Ourisia macrocarpa*, the so-called 'South Island mountain foxglove', a large plant with leaves up to 15 x 10cm, and a multi-headed flower stalk up to 70cm tall, rather similar to *O. macrophylla*, the 'North Island mountain foxglove', which is probably rather better known from our gardens. The other parent is *O. caespitosa* var. *gracilis*, one of the little creeping ourisias, with leaves of only 6mm x 3mm, forming flat mats which produce wiry stems with two, or sometimes three or four flowers per stem. Not the most floriferous of plants in our garden, it tends to give us a nice little green patch with intermittent white flowers.

As might be expected from a cross like this, *O.* 'Snowflake' is somewhere in between its parents. Mat-forming; yes, if a mat can be formed from creeping stems with pairs of opposed leaves some 20 x 15mm. Certainly it covers all of the available ground space when growing well. The leaves are bright green with a splendid dark crimson reverse, and covered in tiny hairs at the margins. The flower stems are up to 15cm tall, with traces of red on the stem, and showing off the red on the backs of the stem leaves, in fine contrast to the white flowers above. This plant is certainly not shy to flower, and our mat of some 1.5 x 1m has hundreds of stems on it every year. Each stem has between six and ten flowers, typical ourisia-style, with the upper two petals shorter than the lower three, almost

like a hornless viola, and a yellow, hairy throat (Fig.114, p.337). The plant flowers for weeks every spring, from early May through to mid June.

Being a hybrid, *O. 'Snowflake'* does not seem to set seed, but this is no problem. As the stems progress across the bed, they root at every node, and it is the easiest thing in the world to propagate. Why, then, does it seem uncommon in gardens? We wonder if the answer is that most gardens are too dry to suit it; our good plant lives in the wettest bit of peat bed we have, almost running water in winter, is totally unprotected, and loves it. The poorer plant is in a sunnier and drier bit of the peat bed and tends to die back in the centre and spread slowly, and rather miserably, across the bed. Many folk have said "Oh, we had that once, but lost it in the summer." Perhaps it is one to try in the bog garden, or right beside a waterfall where it will receive constant moisture.

Ourisia 'Snowflake' is available from a number of specialist nurseries, though it has to be said that it doesn't seem to like the confines of the pots it has to be sold in, and often looks rather unattractive and a little neglected. Don't be put off; this is a smashing plant for that nasty wet corner, and its flowers will almost glow in the dim evening light as you have that final look round the garden.

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My Way with Seeds

GLASSFORD SPRUNT

Over the years during which I have been growing alpines and dwarf bulbs from seed I have probably had more than my fair share of disappointment resulting from total failure of the seeds to germinate, damping off once they have germinated or total swamping of the seed bed by liverwort, pearlwort and/or moss. Success in germination has sometimes been followed by disaster when some passing slug has indulged in a slap-up feed on the fare that I have provided.

My present approach to seed sowing and seedling growing has only been reached by traversing a long and tortuous path with many blind alleys; a maze in fact. Each new idea appearing in print has been seized on, in the hope that at last I may have found the solution to my problem.

One of the early suggestions that I seized on was that the seed pan should have fierce drainage and it suggested that I should put a 25mm layer of drainage material in the bottom of the seedpan. This may be fair enough if there is time to check the pans daily. Two or three busy days with thoughts elsewhere left one, in effect, trying to grow seeds in a desert. That was the most disastrous season ever, for practically nothing grew and a whole growing season was lost.

Gardening literature is liberally sprinkled with a great deal of mythology, which is faithfully copied from one author to another without any attempt at any sort of analysis, let alone critical analysis. One of the myths still current, and I heard it only recently on a gardening programme, was that all pots should be crocked to improve the drainage. I have not crocked a pot for ten years or more and have had far fewer problems since I stopped. Now I screw my pots well down into a sandbed placed on 'mother earth'. This makes certain that there is good contact between the compost and the ground. With good contact there is an infinite reservoir for the excess moisture to drain into, or if the pan is drying out, for it to draw moisture from.

My advice is, certainly, to think critically about what you are doing. To continue using a method because you have always done it that way, is not necessarily smart unless the results are extremely good. Experiment with new methods, but do not abandon the old completely until the new have been proved to be better, and beware of slavish adherence to a "guaranteed" successful system until it has stood up to the test of experimental use in your own hands.

In my busy life as an orthopaedic surgeon, neglect of my gardening activities was inevitably the order of the day. It was, therefore, necessary to devise a system which would bridge the gaps in attention which resulted, and bring the seed sowing to a successful conclusion.

In general I try wherever possible to sow the seeds at the time that they are being shed by the plants. This has two advantages: a) it gets the job done, instead of having the seed stuffed into an, almost inevitably, unlabelled packet only to be sown later as “unknown” or “*Crocus* sp.” or something similar, and b) it improves the chances of a good germination in seeds of short viability.

Bearing in mind that the time required for your seed to germinate may vary from a few days to a few years, precautions have to be taken to make sure that the conditions in the seed pan will remain compatible with nudging the seed into active life over this period. It is also necessary to have a compost which will allow the seedlings to continue to make at least some development until such time as the gardener can get round to pricking out the seedlings.

The properties required of the sowing medium are:

- 1) the ability to retain sufficient moisture to prevent the seed drying out until germination is secure.
- 2) the ability to drain excess water off quickly.
- 3) adequate reserves of nutrients in the main body of the compost to promote active and healthy growth following germination.
- 4) protection of the surface of the seedpan compost against,
 - a) panning of the surface from heavy rain and/or watering;
 - b) invasion of the surface of the compost by liverwort, pearlwort and/or moss, all of which can result in a layer being formed over the pan which is rendered impenetrable to germinating seedlings.
- 5) the compost mix should be varied to take into account the local climatic conditions, especially in respect of rainfall and humidity.

The methods laid out below have been developed over the years, perhaps making more allowances for my own idiosyncrasies rather than those of the seeds I am dealing with. It must also be borne in mind that these methods have been developed to cope with the particular climatic peculiarities of the centre of the central belt of Scotland.

I do not use any peat composts, not necessarily on ecological grounds, but because I can almost guarantee to kill anything that I attempt to grow in them. I like to think that I have a bit more latitude when using soil-based composts because of the in-built buffering of the various constituents of this type of compost.

All my seed sowing composts are based on John Innes No. 3. This is a very variable commodity due to the great variation in its basic constituent, soil, but as I have already said you have a bit of latitude. The one great problem in this country is to find a Garden Centre which treats John Innes compost with respect and stores it under cover. Mostly it is stored in the rain and in a relatively short time this results in a product that is worse than useless.

For those who garden outside the UK, John Innes composts are based on fibrous loam derived from rotted down turves. By volume the basic formula is:

- 7 parts medium loam
- 3 parts coarse sieved peat or leafmould
- 2 parts coarse sand.

Modern long lasting fertilisers are now added to this mix, and give the compost a very much longer shelf life. The original John Innes base fertiliser consisted of:

- 2 parts ground hoof & horn
- 2 parts superphosphate of lime
- 1 part sulphate of potash

4oz(113.4g) of the above mixture per bushel (0.036m³) was used for JI No. 1 Compost, 8oz(226.8g) for JI No. 2 and 12oz for JI No. 3. Ground limestone or chalk is also added at the rate of $\frac{3}{4}$ oz (21.3g) per bushel for JI No. 1 and this amount doubled and trebled for JI Nos. 2 & 3.

The original JI composts were designed for use in clay pots on an open greenhouse staging, and in their original form are not really suitable for use with plastic pots or plunged clay pots. I modify the JI No. 3 to overcome some of the problems and the mix that has resulted is as follows:

- 2 part JI No. 3
- 2 parts modified concreting sand
- 2 parts coarse grit – $\frac{3}{8}$ "(9mm) down
- 1 part coarsely sieved leafmould

I always have trays of concreting sand drying off for sieving. I put it through a series of four sieves and these produce five grades of grit and sand for which I have a use.

- 1) Sieve $\frac{1}{4}$ "(6mm) The grit held back by this goes onto the rock garden.
- 2) Sieve $\frac{1}{8}$ "(3mm) The grit retained by this is used for topping the seed pans and the pots into which the seedlings are pricked off.
- 3) Sieve 15 mesh per inch/25mm.
- 4) Sieve 40 mesh per inch/25mm.

The grit retained by sieves 3 & 4 is mixed and used as the modified

concreting sand of my modified JI No. 3 compost and for the seed sowing layer in my seed pans.

- 5) The finest grit and silt which pass through sieve 4 is retained and used for making cement mortar. Only if there is no brick-laying in prospect is this thrown away. The sieving provides time for thought, so that even this time spent can be used creatively.

Seed pans

Most of my seeds are now sown in square pots. This makes the best use of the available space. It reduces the potential for weeds growing in the seed frame and makes certain that most of the applied water is used effectively. I have reduced to two sizes the pots that I use for seed sowing; 8 x 8 x 9cm and 11 x 11 x 12cm. This reduces the problems of odd sizes resulting in unnecessary waste of frame space.

The seed pans are loosely filled to the top with my modified John Innes No. 3 compost and is then gently tamped down with a tamper which is a loose fit inside the top of the pot. This brings the final level of the compost down to 12-15mm below the rim of the pot. A layer of 3-4mm depth of the following mix is then added:

4 parts fine grit as from sieves 3 & 4 above

1 part fine peat – through 1/8"(3mm) sieve

I have found this ratio the best one for my area, giving the best water holding capacity with the least potential for a good crop of liverwort or moss. The proportion of grit could be increased or decreased for wet or dry areas respectively.

The seed is sown in this layer. Hard coated seeds are pre-soaked in warm water with a little detergent added – for about 24 hours before sowing – and disc seeds like *Tulipa* and *Fritillaria* are sown edgewise to prevent them “hovering” when the covering layer is added. The exception to covering is very fine seed and those allegedly requiring light for germination. In these the pan is gently tapped after sowing to settle the seed. The pan is then topped off with the grit from (2) above. Finally the pan is labelled. I put the name of the plant on the top end of the label and a shortened version of the name on the bottom end of the label. On the reverse I write the source of the seed, the date of sowing and with the bigger seeds – the number sown. The label is then inserted point up.

Once germination has been achieved the label is inserted the right way up. It is thus easy to see how the germination stakes are going even when the seedlings have gone below ground.

Some species seeds show considerably erratic germination, and I am often anxious to get on with potting up those which have germinated.

Having three distinct layers in the pan makes it easy to deal with this and then put the rest back to get on with their tardy germination. The top grit comes off easily, the layer containing the seed is easily separated from the underlying compost. The seedlings are then extracted. I usually replace this compost with fresh, put back the seed layer and top off again with the coarse grit and reverse the label once more and await further germination.

The topping layer in the seed pans is usually about 10-15mm deep. This does not appear to cause the seedlings any problems nor does it seem to prevent the germination of those allegedly requiring light, but it does seem to be sufficient to reduce the problems of the growth of liverwort, pearlwort, moss and sundry other weeds to the minimum.

Where it is possible I like to take seed straight from parent plant to seed pan. It is the way that nature does it and in some cases it is the only way to obtain a worthwhile germination or, indeed, any germination at all. Many of the *Primula* family, *Ranunculaceae*, *Corydalis*, *Hepatica* and *Hacquetia* respond well to this treatment and will often produce an embarrassingly high rate of germination.

Seed from the various Seed Exchanges is much more problematical. The viability of seed can be profoundly influenced by the way that it is treated between collection by the donor and sowing by the recipient. Perhaps a controlled study of the various conditions to which seeds are subjected following collection would be of considerable interest and might elicit whether or not seed has lost its viability or just become profoundly dormant and requiring the right key to stir it to life.



Dionysia aretioides

Edith Clark

The Seed Exchange

JEAN WYLLIE

The Seed Exchange continues, we hope, to be the most efficient and successful seed exchange in alpine gardening circles. Last year there were 4489 items in the seed exchange; between August and October these were catalogued and sorted, in November and December they were divided into some 70-80,000 packets of seed, and in the New Year these were distributed all over the world. We hope you were happy with them, and have lots of new plants growing on in the garden. I would like to express my thanks to all of the members of Stirling, Edinburgh and Fife whose combined assistance has made the seed exchange run smoothly: without them, there would be no exchange.

We hope you are already collecting your seeds for this year's exchange. Please do ensure that the seeds you send in are correctly named and labelled. (*It's very frustrating to sow gentians and get a superb germination of alliums! Eds*), and if you send items which are new to the exchange, please include brief notes to describe and verify the plant, to ease the processing of the seed, and satisfy our curiosity!

The Main Seed List will run in the same way again this year, so please read your Yearbook (p7) for details. Please, ensure you send requests for seed lists and order forms to the right person. To clarify the procedure:

Seeds and requests for seed lists should be sent to **Mrs Jean Wyllie**, 1 Wallace Road, Dunblane, Perthshire FK15 9HY, by 23rd October. If you can, send a couple of self addressed labels for your acknowledgement and seed list – it all helps.

Completed order forms for seed from the list should be sent to **Mr Morris Wilson**, Nydiehill, St Andrews, Fife KY16 9SL.

The Easy Ten has now run for two successful years, and seems to be encouraging more and more beginners to participate in the seed exchange. We hope that those of you who order the easy ten will order from the main exchange as well; we know seed sowing is addictive. The service will continue this year with a different selection of ten easy-to-propagate alpiners for you to try.

If you want to participate in the '**Easy Ten**' scheme, send remittance of £1.00 and your name and address to **Mr Morris Wilson** (address above), before 14th February 1993. You will receive 1994's 'Easy Ten' packets of seeds and basic instructions on growing from seed in mid-February.

Half a Jubilee Left to Go!

SANDY LEVEN

A large number of members have been jubileeing, conferring and generally having a good time. This behaviour started at the Dwarf Bulb Display at Dunblane in February, enjoyed by members from as far apart as Caithness and Sussex. Any clouds on the February horizon were banished by Michael Almond's superb talk on the bulbs of southern Turkey.

The spring show entries were well up on previous years, as jubileeing members entered plants so that they could get one of the special jubilee badges. So far over 300 have been given out. Entries of more than ten plants in a class were frequent. Judging section 2 was no easy matter this year. Now that they have started showing let us hope that these new exhibitors continue. There was fierce competition for the framed Duncan Lowe drawings awarded in the special six pan classes. The quality and number of exhibits in these classes was staggering, so much so that we intend to continue to have small six pan classes at all next year's shows. Thank you Duncan for the marvellous drawings.

The garden visits started in Ayr and have continued to Glasgow, Northumberland, Lorn, Perthshire and Angus. I have been lucky enough to see 19 gardens so far. In choosing the dates we chanced on two very wet Sundays, which provided the opportunity to see clutches of enthusiasts huddled together under umbrellas discussing the merits of rhododendrons and plant associations. We saw plants which we had not seen before, marvellous troughs, forgotten delights and ideas galore combined pleasure with interest. We all returned home stimulated to grow something new. Thank you to all who toiled during spring and invited us to these gardens. There are still plenty more to be visited. If you have not started looking you can join in during the summer and autumn.

The highlight of the first half of this year was the Jubilee Spectacular in Oban. 170 Dutch, Belgian, Canadian, Irish and English members joined Scots on Scotland's west coast for banquet of plants and gardens. The hospitality was exceptional. We were privileged to be guests in some of Scotland's most beautiful rock gardens, in wonderful country, with mountains, sea lochs and sunshine. We even had a Civic Reception from Argyll and Bute District Council! Thank you, Oban. Thank you, Hilary Hill and the Lorn Group for all your hard work. One question. "How did you keep all the midges away?"

On behalf of the SRGC I want to thank all who have welcomed us into their gardens and homes.

Events, July - October 1993

Perth – 31st July. Summer Display. Details in the Show Schedules.

Glasgow – 6th September. Buffet reception and lecture: Plant Collecting in the Far East, by Sir Peter Hutchison of the RBG Edinburgh. Details from Mr Charles Drury, 14 Dirleton Gate, Bearsden, Glasgow G61 1NP.

St Andrews – 24th - 26th September. Diamond Jubilee Discussion Weekend.

Aberdeen – 30th October. Autumn Bulb Display, and lecture on Bulbs by Paul Christian. Details in the Show Schedules.

Jubilee Travelling Speaker. Dr George Smith will visit most groups during the fortnight after the Discussion Weekend, with a range of lectures which will vary from group to group. Members are invited to attend any of these meetings. This is a unique opportunity to hear one of our most widely travelled plant hunters. George has written and lectured on primulas, Himalayan travel and Himalayan plants, and has introduced many of these into cultivation. Full details of the tour are in the Secretary's Page.

Gifts, Goods and special productions

Car Stickers

With this issue of **The Rock Garden** you will receive, free, a new car sticker. Please use it to advertise the club. Stickers for your second (or third!) car are available from Mr I. M. Aitchison, 20 Gorse Way, Freshfield, Formby, Merseyside L37 1PB, at £1 inc p&p.

Lawrence Greenwood Print

A wonderful offer has been made to us by Lawrence Greenwood. He has agreed to the club producing a limited-edition screen print of one of his superb paintings, which so many of us admire at the club shows. The picture in question is of *Paraquilegia grandiflora*, worked from a slide taken by Ron MacBeath in the wild in Lijiang, China. This is the very first time that Lawrence has produced any kind of print, so it is a very special offer indeed. The print run has been limited to only one hundred copies, signed by Lawrence, of course, and these are available on a first-come first-served basis. Cheques with your order please, made payable to SRGC. To secure your print, please contact Mr Ian Young, 63 Craigton Road, Aberdeen AB1 7UL, phone 0224 318617. You can also choose between framed and unframed prints. Prices and details are:

Framed prints: mounted in a grey finish, quality wooden frame, £60 each. These cannot be posted; you must arrange collection of these with Ian Young.

Unframed prints: £30 each. UK Postage £4 per print, which will be mailed in a strong tube. Post and packing overseas will be charged at cost.

The SRGC Collection

The full range of SRGC Collection clothing is still available, and can now be supplied mail order. Both polo shirts and sweatshirts have been added to the range, in navy or white, with the club logo. For full details of how to order your SRGC Collection clothing, see the advertisement in this issue.

Also available, but regrettably not by post, are SRGC Jubilee Mugs, in either bone china or ceramic, with a beautiful mountain scene, drawn by Anne Chambers, showing *Dryas octopetala*, *Soldanella alpina*, *Silene acaulis*, *Pulsatilla vernalis*, *Gentiana acaulis* and *Gentiana verna*. The mugs are available at the Jubilee events.

Jubilee Collection Competition

When you've bought your jumper, bodywarmer, sweatshirt or polo shirt, take it with you on holiday, and get someone to photograph you in appropriate habitat. Send the photograph, with the names of the wearer, photographer, habitat, and any mountains or flowers to Mr A. J. Leven, SRGC Publicity Manager, 2 Leighton Court, Dunblane, Perthshire FK15 0ED. The best photograph will win a £10 prize, and all will be displayed at the AGM. Closing date for the competition is 30th September.

Membership List

This autumn we will produce an updated membership list of the club. This will be available to all members at a price of £1.00. To order your list, send a 7" x 5" s.a.e. and your remittance, to:

Mr Ian Aitchison, SRGC List,

20 Gorse Way, Freshfield, Formby, Merseyside, L37 1PB.

Cumulative Index

As part of the Golden Jubilee celebrations of the Club in 1983, a cumulative index was produced of the journal issues 20 - 69. Ten years on, we have decided to produce a further cumulative index, covering issues 70 - 93, Volumes XVIII - XXIII. Part Four of Volume XXIII is the January 1994 issue, and we hope to publish the Index shortly after that. Prices and details will be in the January 1994 issue of **The Rock Garden**, so watch this space.

Diamond Jubilee Discussion Weekend

ST. ANDREWS, 24th–26th SEPTEMBER 1993

It is a number of years since the East Fife Group last hosted the Discussion Weekend, and things have moved on somewhat in the interim. The number of members expected to attend the **Diamond Jubilee Discussion Weekend** in this special year has precluded the use of St. Salvator's Hall in St. Andrews University. We will, however, be using University Hall, which is of the same vintage and has even better accommodation. The lectures will be held in an up-to-date lecture theatre in the Physics Building, and the show, trade stands and book stall will all be housed in one large hall adjacent to this.

The programme of lectures promises to be interesting and varied. The team of speakers promises to provide us with interesting insights into alpinism, both in cultivation and the wild, and will doubtless leave us with plenty of food for thought.

Since this is the Jubilee Year, there will be two special prizes awarded at the plant show, as well as the Diamond Jubilee Class prizes of Duncan Lowe drawings. One has been donated by the East Fife Group, and the other by the Seed Exchange. It is hoped that as many members as possible will endeavour to bring even a few plants to make the show the success that the occasion demands.

The Saturday morning will include a visit to St. Andrews Botanic Garden. Much has happened here since the last SRGC visit. The University, like many such institutions, was short of money, and had been cutting staff numbers and dispensing with collections over a number of years. It was on the point of closing when North-East Fife District Council agreed to take over the garden. It is gratifying that this, together with much help from the Friends of the Garden has improved the position enormously. One example is the new landscaped alpine house – much of the planting was done by local group members – which was opened in May 1992 and should provide much interest.

During the weekend, facilities will be available for members who wish to show their own slides, and there will be a "silent auction", where sealed bids will be taken for the more special plant donations. The proceeds from this auction will go to the SRGC Exploration Fund.

Programme

Friday

8.00 pm **With Great Pleasure**

Dr Gwen Black

9.30 pm Dwarf bulb meeting and exchange

Saturday

10.00 am Visit to St. Andrews Botanic Garden

12 noon Show opens

2.30 pm *The William Buchanan Memorial Lecture*

The Cultivation, in Ireland, of plants from Australasia

Mr Harold McBride

4.15 pm **Scottish Mountains and their Flowers**

Mr James T. Aitken

7.30 pm Conference Dinner

After dinner speaker: Dr Alfred Evans

Sunday

9.45 am **Asiatic primulas in cultivation**

Mr John Mattingley

11.30 am **Turkish Bulbs in nature and cultivation**

Mr Jimmy Persson

2.30 pm *The Harold Esslemont Lecture*

The Primulas of Sino-Himalaya in the wild

Dr George Smith

Prices

Residents

Friday dinner – Sunday afternoon tea £106

Saturday lunch – Sunday afternoon tea £76

Sunday dinner – Monday breakfast £24

Non-Residents

Saturday or Sunday: morning coffee, lunch, afternoon tea
and all lectures £20

Saturday evening conference dinner £23

The booking, together with the appropriate remittance, payable to the
Scottish Rock Garden Club, should be sent to:

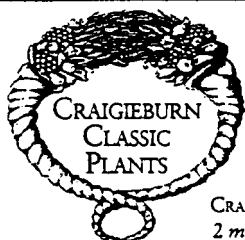
Mrs Elizabeth Field

2 Maynard Road

St Andrews

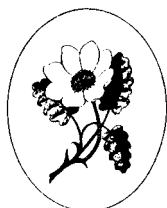
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Anyone requiring further information about the weekend should
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The speakers will be PETER CUNNINGTON, on "Alpines of Ness" and "Soviet Central Asia"; NICK TURLAND on "Crete in Spring" and "South West Turkey" MICHAEL NORTHWAY on "Raising Stock".

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Please send S.A.E. for full particulars to:

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