

THE ROCK GARDEN



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The Rock Garden

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Celmisia verbascifolia (see p.30)
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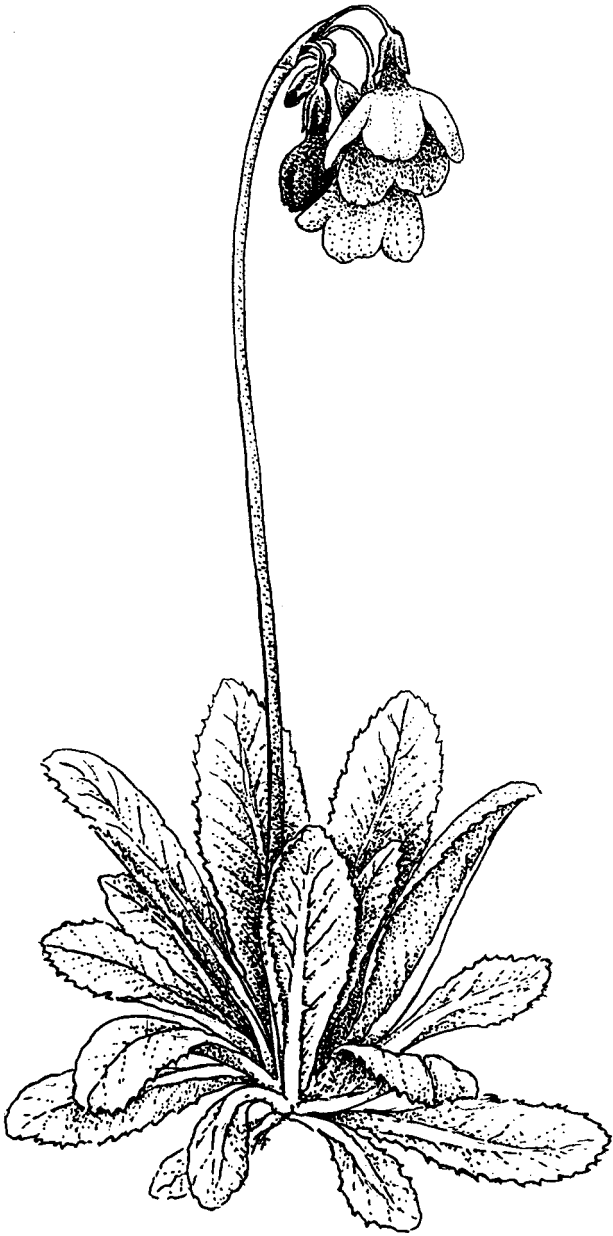
The Editors would greatly welcome contributions to **The Rock Garden** on any aspects of alpine and rock garden plants and their cultivation. Articles should follow the format of previous journals, with colour slides and line drawings if appropriate. They should preferably be typed, double spaced, or 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.

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Primula ioessa

Heather Salzen

Editorial

The show season is just about over for another year, and the early morning departures for other parts of Scotland and northern England are coming to an end. The motorways will certainly be less pretty without the trail of estate cars full of bloom heading for the day's show.

We often wonder why we do it; isn't it more sense to leave the plants in the garden or the alpine house, and have a nice relaxing weekend in the garden – perhaps even with a gin and tonic – enjoying our own show. Maybe if we didn't go to the shows we wouldn't have to do a twenty-four person-hour weeding, clearing, planting, splitting and mowing session on a Sunday, to get the garden straight before a visiting group arrives!

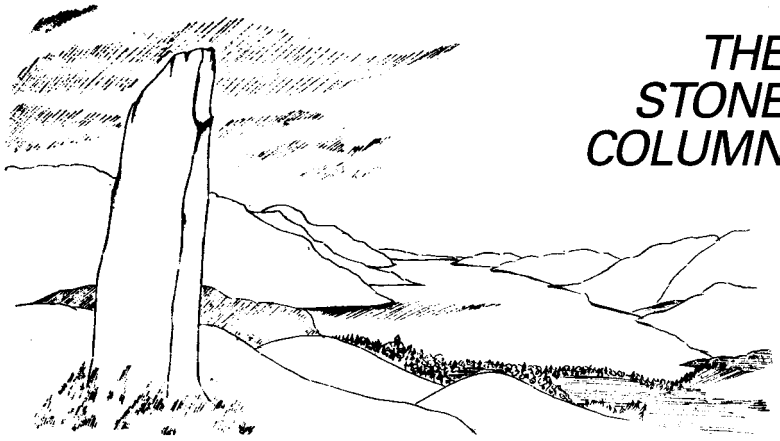
We reached the conclusion that we do it for sociable reasons; it's nice that other people see your best plants – even if they're not in the same class as some of the other exhibitors' superb displays, and it's a pleasure to meet with like-minded folk from all over the country, and swap stories, plants and experiences. We're always learning, and are sure we always will.

With the pricking-out and potting-on season beginning, we're looking at drifts of seedlings and wondering what to do with them all. Like most gardeners we don't have the heart to throw good spares away, so we'll prick out hundreds. Some will go to friends, but this year we can put plants aside to sell at the Edinburgh Discussion Weekend in September, the next event in the rock gardeners' calendar, and a great place to find things you've never seen before. Maybe we'll see you there, searching through the plant stalls for that elusive 'Forrest potential plant' to put in the back of the car a few springs hence and head off to the show to astound the judges and the public.

Next year's show season, of course, has "the big one" in the middle of it. The Alpines '91 Conference is the once-a-decade chance to mix with rock gardeners from all over the world, and share their experiences too. The programme makes it seem like a week's holiday in Warwick will be a plant-hunting expedition to most of the world. That plus the chance to swap plants and stories makes it look too good to miss.

CAROLE AND IAN BAINBRIDGE

THE STONE COLUMN



Once in Five Hundred Years Times Four

Our garden here at Askival has evolved slowly over the years, rather like many palaeontologists believe so does life itself: long periods of comparative stability punctuated by much briefer interludes of rapid change. The parallel may be taken a little further; evolution operates over a vast time scale, perhaps influenced by climate, whereas gardening is short term, constrained by day to day weather. In our case, sudden spurts in construction are the result of suitable periods of dry weather in autumn or spring, when the routine weeding load is absent.

The past autumn of 1989 was a little wetter than normal, but there were a few dry days here and there, so some progress was possible in two areas of our upper garden. On a slope, facing a little to the east of south, I was able to complete the terracing for the 'Blue-Ridge' bed. The name arises from the intended primary purpose: to grow Ericaceae from the eastern United States, which we feel may need full sun up here to do themselves justice. This bed, inspired by our visit to North Carolina in 1984 (Rock Garden No. 76, p216 ff) was started back in 1986 and has proceeded slowly in fits and starts ever since.

On the site chosen, the topsoil is only some 10cm or less deep, over stones and gravel, so we decided not to try and dig the area, but to put the bed on top. The sward was first killed by spraying with paraquat, which breaks down completely in soil leaving no harmful residues. We have recently heard that some of the "woolly-hatted, woolly-brained lentil stirrers" want to ban paraquat, presumably because the concentrate is poisonous to humans. The form we use is a thick bright blue liquid with an added awful odour! I cannot imagine anyone drinking it by mistake. If it works, someone wants to ban it! Next I built a series of dwarf walls across the slope, filling in behind with a mixture of soil from the old fruit garden, peat and leaf mould. The walls, of two courses of boulder stones,

vary in height from 30-50cm according to the lie of the land, to keep the terraces behind fairly level.

We have three leaf mould pits, each about 2m square, which we empty and refill in rotation. After the leaves have rotted down for two years, they occupy a depth of about 0.5m, which gives us some 2m³ of leaf mould per year. Apart from a small proportion used in some of Poll's potting composts (for *Meconopsis*, *Nomocharis*, *Trillium* etc) the Blue-Ridge bed consumed three years' production. We prefer to incorporate our leaf-mould for soil improvement, rather than use it as a top dressing, especially in new beds which have a high proportion of small plants. We have a great many blackbirds which scatter a top dressing of leaf mould everywhere, making a terrible mess and quite often heaving out one's choicest and most irreplaceable treasure at the same time. After a summer dry spell, pure leaf mould can dry out on top and blow around. Whenever Poll does any repotting, we recycle the old compost onto the garden as top dressing. The chippings or grit in the mixture fix the dressing in place, make it easier to re-wet, and render the blackbirds totally disinterested.

There is much argument in the horticultural literature as to whether autumn or spring planting is to be preferred. Most would agree that mid-winter is best avoided. No matter how assiduously one repots, many alpine will coil their roots around the bottom of the pots as soon as one's back is turned. We find such roots are better spread out on planting into the open ground, despite the disturbance this entails. Up here such operations are preferably carried out in spring when the plants are in active growth and can repair any root damage quickly. Most ericaceous plants are exceptions to this rule, their compact fibrous rootballs requiring a different technique. When planting them out from pots, the chief danger lies in any subsequent drying out. There may well be a substantial rain-shadowing effect from the foliage, so the plant is relying on water moving sideways into the rootball via capillary contact with the surrounding soil. Before planting we always rub up or scarify the outside of the pot-shaped rootball. This has two benefits; it encourages rooting out through a less abrupt boundary, and improves capillary contact. On our light soil we have to plant quite firmly to ensure good enough contact, but this could be detrimental in heavy clays. We follow the same procedure when repotting Ericaceae and their relatives: there is a danger that any water applied will run down around the side of the pot, through the more porous new compost, leaving the roots in the centre virtually dry. If one receives an ericaceous plant in a pot bound condition it is preferable to repot it and grow it on, until the roots reach the outside of the new compost, before planting it into the garden. If this planting is carried out in autumn, then the winter rains will settle them in, and there could be some root extension before the spring growth flush and its high demand for water.

The Blue-Ridge bed was actually planted in early November, about a month later than we would have liked, but there had been a knock-on delay following the August monsoon of 1989. We first laid out all the pot grown plants on the bed, also using markers for any to be transplanted from elsewhere in the garden. We do not belong to the outdoor furnishing school of border design, where colour combination is all: but we did try to follow a few simple rules: no two cassiopes or vacciniums together for example. Low creeping or trailing plants are planted at the front of each terrace, to grow down over, or sucker through the wall. Taller plants, such as *Clethra alnifolia*, *Kalmia latifolia* and some of the vacciniums were placed in the centre of the terrace, with those which prefer some shade, such as *Epigaea repens*, to the north. We included a range of shortias to see how they will do in full sun. We have heard they are grown thus in Japan to improve leaf colour.

While I was completing the construction of the top Blue-Ridge terrace, Poll dug over an area next to the upper garden conifer bed. Here in a hollow the topsoil was deeper, having drifted in over the years, but even so she was only able to go down to a bare fork's depth. After removing the usual two to three barrow loads of stones from each square metre, the soil level dropped by about 7.5cm! When breaking in new ground, the fork has to be winkled in between the stones; a spade is quite useless! We use one for digging planting holes in previously prepared soil, and barrow filling, but never for the traditional turning over of beds and borders.

With Poll's new herbaceous bed broken in, and the Blue-Ridge planted, the remaining few dry days of November were taken up by a belated start to leaf clearing. December arrived, and with it a change to frosty weather! Between November 30th and Epiphany we only had six individual frost-free nights, and the ground remained hard throughout. Readers may well be surprised at this, for we understand this cold weather was confined to the north of Scotland. As is our established practice, we use such periods to replenish our stocks of what we call walling-stones. We made some thirty trips to our 'stone-mine' in a ruined dyke on a friend's farm – bringing back a ton each time in Grizewald, our 110 Land Rover. The really strenuous and thoroughly boring part was barrowing them, two or three at a time, the 120m up to the top garden where construction is now concentrated. Tipping them out, the ground resounded like a wooden floor.

It has often been said that in general, the seed of alpine plants does not require chilling before germination can occur. While in theory this may be true, we have found that in practice a cold period is beneficial. After the 'winter that never was' of 1988-89 germination rates were exceptionally poor. On the other hand, after last December's freeze-up, rates this spring are excellent, boosted by many of the previous season's sowings which had

held fire after that ridiculously mild winter. Especially gratifying has been the germination of many of the Ranunculaceae, for example *Ranunculus adoneus* from Gwen Kelaidis' seed sown last autumn. Many of our own western American collections, from our 1988 trip, have waited until this year to germinate. In spite of a hot July, *Meconopsis punicea* set lots of viable seed here, and Poll has pricked out six trays of seedlings. Many plants of this beautiful red species are essentially biennial, so we must do our best to propagate it every year. However, one of our original plants has survived to flower for a third year running. When we raise batches of the closely related *M. quintuplinerva* from seed, most of the youngsters are short-lived. The form in general cultivation is clearly an unusual perennial multiplying clone. We can hope a similar one of *M. punicea* will turn up, to help ensure its continuance in cultivation. We actually like the distinctive habit of the dangling scarlet petals.

Back to the weather, and the new decade had hardly started when there was an abrupt change: a seemingly endless succession of weather fronts passed across from the west. In the intervals, the weathermen say "scattered showers, chiefly in the north and west". The reality here is almost continuous rain, lighter spells merely alternating with heavy bursts. During each of the first three months of the year, over 400mm fell, totalling up to our entire annual average! The lower part of the village was evacuated four times, as the 'once in 500 year floods' recurred repeatedly within the single month of February! Although gales blew almost every day, there were none of exceptional ferocity, unlike the big storms down in England. While explaining to its readers that storms were tracking further south across the British Isles from the Atlantic, the Sunday Times stated "normally Britain is *fortunate* because the storms pass nearer to Iceland and usually miss us (although Northern Scotland often catches the lash of the passing depressions)". We shouldn't be surprised that a London-based journalist considers it fortunate(!) that the far north bears the brunt of storms in an ordinary winter.

As the weeks wore on, it became more and more frustrating to stand at the windows gazing out at all the clearing up still to be done. There were but eight dry afternoons in the entire first quarter of 1990! Only a visit to Ireland in mid-February managed to raise our spirits during this dreary period. Most of the time I had to be content with nipping out between showers to make lists of names of plants in the garden in order to give them engraved labels.

Inevitably, for the second year running, Crocus suffered severely. The early species were only open for one day, straight after our return from Ireland. *Crocus flavus* came into its own, showing a rich orange-yellow, even when closed. This form comes true when it self-sows. We consider it

a much better colour than the old 'Dutch Yellow' which has the added disadvantage of being a sterile hybrid, *C. flavus x angustifolius*. The opening of croci is not simply a matter of sunshine, it can be temperature induced. On an exceptionally mild March day three species opened in the pouring rain; *CC. sieberi*, *minimus* and *vernus albiflorus*. The *C. minimus* was unusually early, it is normally an April flowerer here, escaping the worst of the weather. The *C. vernus albiflorus* was flowering for the first time. We had raised them from wild seed contributed to the 1985 SRGC exchange. This subspecies of *C. vernus* is a relatively high altitude snowpatch plant, said to be difficult to cultivate. But, as we've said before, true alpinists often like Scotland, sensible things!

Confined to the house with flu, I had time to try and count the flowers on our patch of *Iris winogradowii* in a narrow border just below a front window. I gave up when the total reached seventy. We cannot understand why people wish to hybridise this with *I. histrioides*, to produce those strange muddy colours. The original soft yellow is so distinctively beautiful! With us they don't normally overlap in flower, *I. histrioides* is much earlier. Like *Crocus vernus albiflorus*, *I. winogradowii* is a mountain plant. Its roots are almost continuously active and it should definitely not be dried off. The myth that baking is required reappeared as recently as 1985, in the Kew Magazine. The article also stated that increase was slow; we are not surprised!

Without doubt, this is the kind of spring which makes one appreciate the merits of reliable ordinary plants, such as *Pseudomuscari azureum*, also listed as *Hyacinthella azurea* and *Hyacinthus azureus*, thus having a name of each gender. The flowerheads are a good blue, freely produced, even as young plants, and carried on sturdy storm-proof stems. It seeds around somewhat but is not a menace.

Mentioning a plant in print can on occasions be a dangerous thing to do. Immediately after writing up *Ourisia fragrans*, a severe winter killed all our plants, *Lilium parryi* was consumed by a large patch of *Galax*, and *Aciphylla hookeri* succumbed to the past wet winter. This time last year we mentioned that *Fritillaria verticillata* was flowering well, this year it is even better with seventeen spikes, each bearing half a dozen or so of the greeny-cream bells. Waiting ten years for a tree to flower is nothing, but a bulb? Down in the trough area *Saxifraga poluniniana* is worth recording as the only Himalayan species to do really well outside here. Now seven years old from seed, it has formed a mat 20cm across. The flowers have three stages: deep pink in bud, opening white, then fading back to pale pink.

After the three-month downpour we were expecting many losses, but it just hasn't happened. Perhaps this is because the continuous rain and sleet produced a flow of cold, well-oxygenated water past plant roots, less

conducive to rotting than warmer, more stagnant conditions. One sad exception was our last surviving plant of what used to be called *Celmisia coriacea* 'Bronze form', now *C. semicordata aurigans*. The distinctive leaf colour has been passed on to some of the 'Inshriach Hybrids'.

Eventually, the weather had to relent, and we were able to work outside for much of April. Before we could re-start 'winter' clearing operations, an entire compost heap (one of two) had to be emptied to make way for the debris. We used the two barrow system; I filled one through the coarse barrow sieve, while Poll wheeled the other up to her newly-dug bed. The compost covered its 5m x 6m area to a depth of 15cm. The heaps are 2m long by 1.5m wide and deep, check the arithmetic if you like, dear reader, it does work out! We then ignored this bed for a week or so to allow the compost layer to dry a little to lighten the task of forking it in.

As always, the bulk of the dead foliage in the herbaceous beds was provided by the Sibirica group of irises. Removing their tangled manes is Poll's annual pet hate. She now uses a serrated-edged 'Kitchen Devil' knife to slice off the foliage, gathering it with her free hand. The knife is much quicker and easier than the one-handed shears she used previously. After a week of training at the irises, Poll was able to mix together the compost and soil for her entire bed in one long afternoon's blitz. The next stage was to edge the bed with a continuous row of small boulders, laid ready nearby during the December freeze. This boundary tells human feet, and dogs, where to walk. Paths are just trodden earth in this stony garden. Finally, lines of flat stepping stones were laid, to subdivide the bed into an irregular pattern of strips, each 1.5m wide. A rake makes a convenient measure. We can then weed each strip from either side without treading on the planted area. As soon as this was finished, the weather had another dirty trick up its sleeve: 25°C is ridiculous for the end of April! Prevented from planting out, I built another raised frame on the site where the soil for the Blue-Ridge had been removed. Constructed to our standard design (Stone Columns June 1983 and 1984), this one is 6m long by 1.5m wide. Poll did provide me with a small electric concrete mixer, before requesting yet another frame. Next birthday I'm going to get her a new saucepan!

Few other consequences of the sodden quarter remain to be recorded. When I eventually gave the grass areas their first cut, on April 22nd, there was so much moss I had to empty the bag every 10m or so. Luckily I had made a barrow extension, to triple its capacity, while confined to the house. Even so I lost count of the number of trips to the moss mountain in the far corner of the upper garden. Leaves lying on dwarf rhododendrons for most of the winter caused some defoliation, whereas on *Cassiope* this provided another excuse for their shoots to turn brown in places. On the positive side, this has been the best year for flower we can

remember, from the tiny *C. lycopodioides gracilis* right through to the robust upright 'Askival Hybrids' (*C. wardii x fastigiata*).

Back in the early '80s, inspired by Ken Gillanders' lecture at Alpines '81, we attempted to introduce a number of choice Tasmanian alpine plants into our garden. Many, such as an entire batch of seedlings of the compact, blue-fruited *Coprosma moorei*, promptly departed during the hard winters of that decade. Our interest switched to American alpine plants in the expectation that they would prove more resistant, especially to root freezing; and indeed, such has been the case. Now that the Highland climate appears to be moving towards an Atlantic, rather than Continental phase, perhaps we should give alpine plants from Tasmania's wet and windy mountains another trial. After all, two of the charming dwarf heaths from the exposed feldmark atop the Snowy Mountains, *Epacris microphylla* and *E. petrophylla*, regularly produce their white bells with spreading lobes here. The spectacular *Ranunculus anemoneus*, from the same general area, is about to flower for the first time. I go each day to check on its progress; even a watched bud should open eventually.

Label Engraving

Five years ago (Stone Column Jan 1985 p113) we explained why we prefer aluminium labels to plastic for general garden use. We still stand by this advice, although we do use plastic labels and one of the so-called permanent markers for all our pot plants (Pentel N.50 is the best so far). The label, if embrittled, can be replaced, or the writing renewed when repotting.

Most of our aluminium labels are fixed on galvanised wire stalks as we described; up above the soil they will literally last a lifetime. To make full use of this permanence one obviously requires an equally long-lasting method of writing on them. Plants in this garden have a habit of eating their labels. It can be very frustrating, after several minutes of rooting about in the wet undergrowth, to come up with a completely blank label. The antidote was suggested by Jim Sutherland, Inverness Group Convener, in the form of a Burgess Power Tools Professional Engraver, model 480. After a little practice, it's quite easy to write with; a tip passed on by Jim is to run the lead over one's right shoulder (if right-handed), to help balance the weight of the engraver. As the carbide tip vibrates rapidly it makes quite a noise. I work in a room on my own and wear the ear defenders supplied with our chain saw. Another slight drawback is that mistakes cannot be erased, so I work from a previously-checked list of names.

We are fortunate in possessing a good stock of both 10cm and 12.5cm Hartley aluminium labels: we went round hardware stores buying them up when production ceased. Most came from a shop in Perth. Alitags are

the current equivalent, if one is rich enough. Jim himself uses aluminium sheet, such as that from old caravans. He marks out the sheet and engraves the names before cutting it up into labels. This is easier than holding each separately. Old scrap Venetian blinds have also been suggested, though one would need to be careful with the colour – pink labels anyone?

Many years ago we inherited a Serpent Label machine and a couple of hundred of the lead blanks. We still haven't decided what to use them for. They do make neat pot labels, it's possible to curve them horizontally to fit inside the rim, but punching one letter at a time is tedious. Maybe when I've retired, and it rains for three more months.

Winter to Spring and Back Again

Some time ago, when the 'troubles' in Ireland were rather worse than they are now, we were invited over to speak to both the AGS Ulster Group, and the then newly-forming one in the South. At that time lecturers were understandably a little apprehensive about crossing the Irish Sea, but now apparently they are queuing up to be invited. This is no surprise to us, in view of the marvellous times we have had over there.

Our recent trip followed the same basic pattern as the first one, flights to and from Belfast, with a return train journey to Dublin in between. These bare bones were fleshed out by a thoughtful programme, generous in both time and scope. A visit to the Giant's Causeway on a sunny, windy day was but one highlight. My maternal grandparents were from Ulster, and often spoke of holidays on the Antrim Coast, so this was a sentimental journey for me.

As gardeners we're learning all the time and there are few better ways than garden visiting. There are always plants one hasn't seen before, such as the vanilla-scented shrub *Azara microphylla*, too tender for the central Highlands, or uncommon successes like Bob Gordon's *Castilleja miniata*. To provide a host, Bob grew it in the same pot as a 'Rabbit Bush' *Chrysothamnus nauseosus* and planted the two out together. The latter, a straggly bush, hardly looked large enough to support the *Castilleja*, which we were told, flowered all last summer. Nearby was a large *Dryas*, perhaps this is also being robbed.

In general the North appeared to be some four to five weeks ahead of Askival, with Dublin another two weeks again. At home *Galanthus nivalis atkinsii* was just showing white buds, while in a sheltered Dublin garden the so-called summer snowflake, *Leucojum aestivum*, was already in full flower! With us, it opened at the beginning of May, fully ten weeks later.

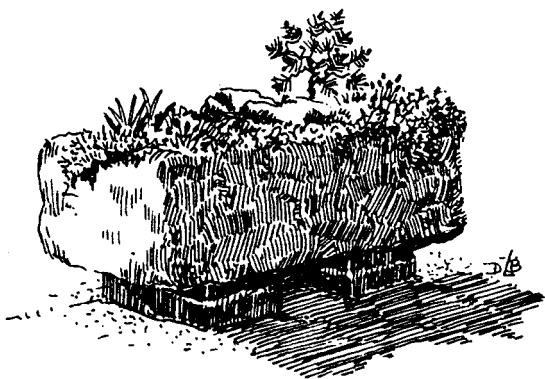
There is always one group of plants which springs to mind most readily when recalling any particular garden visit, such as the *Adonis vernalis* on the rock garden at the RBG Edinburgh when we were down for the Show.

In Ireland it was without doubt Hellebores which stood out most vividly, from the superb 'White Magic' in Ballymena to Helen Ballard's named hybrids in the South. The yellows are much better than I'd imagined, and the rich dark colours can be quite sumptuous. Having seen how well these plants can do, we would possibly be well advised by our Glen Garry friend who will not grow Camellias (Rock Garden 84, p227). We once bought a number of *H. orientalis* forms, every one of which failed. They each put up one weak leaf the first year, and nothing the next, an expensive experiment. We also find *H. niger* an unsatisfactory garden plant; we cannot keep the foliage healthy no matter what fungicide we use. We have raised some fairly dark *H. orientalis* seedlings of our own, around one in three will survive if planted out quickly. It might be an idea to try direct sowing where they are to grow.

Apart from the gardens and the hospitality, we returned with many other moments to treasure. Admiring a crimped-foilage form of *Ajuga* on one of Margaret Glynn's troughs, I was given a knife and a fork and told to help myself. Was I meant to dig up a piece, or eat it? Then there was the conversation with Helen Dillon as to whether gardening is primarily art or applied science. Actually it's both: science to make the plants grow, and art to make the effort really worthwhile.

The contrast between our Highland climate and the more benign parts of the British Isles was again obvious when we drove down to Newcastle in April. We left Fort Augustus in a shower of sleet, arriving to find people already watering their gardens. Next day we returned to fresh snow on the tops around the village, having passed a new rain-induced landslip in Glen Spean.

Science or art, wet or dry, gardening, like life, would be awfully boring but for the infinite range of possibilities.



The Genus *Celmisia* in Cultivation

JOHN RICHARDS

Introduction

Celmisias, or 'mountain daisies' are evergreen, often silvery, perennial herbs or sub-shrubs with white daisy flowers, the central disk being yellow. Although the species are very diverse in size and form, *Celmisia* is a well-defined genus of about 62 species. Of these, all except three which are from Australia, are endemic to New Zealand. They are mostly mountain plants, and the majority are restricted to South Island, where they form important and conspicuous elements of many montane and alpine communities.

Although many species are rare and localised in the wild, about 50 have been in cultivation at one time or another. About 15 species are frequently grown in the UK and are available from the trade, although many plants offered are now hybrid.

Celmisias are valuable garden plants, as much for their handsome foliage, which lends colour and structure to the rock garden throughout the year, as for their early summer flowers. There has been a tendency to grow *Celmisias* in special 'New Zealand gardens', and their architectural foliage certainly blends well with that of *Aciphyllas*, *Hebes*, *Raoulias*, *Helichrysums* and *Astelias*. However, they also make excellent 'spot' plants in the general rock garden, and they can be used to make stunning foliage contrasts.

Their use depends on the size and growth form of the individual species. There are two or three cushion forming species (*Celmisia argentea*, *C. sessiliflora*) which make good plants for the trough or exhibition pans, and some of the rosette-forming species with linear leaves (*C. alpina*, *C. laricifolia*, *C. gracilentata*) are sufficiently dwarf to remain in scale with the smallest trough.

Numerous sub-shrubs make excellent features for the rock garden; of these *C. allanii*, *C. angustifolia*, *C. hectori*, *C. prorepens*, *C. bonplandii* and *C. ramulosa* are amongst the best. Also suitable are many of the larger linear-leaved species such as *C. longifolia*, *C. major* and *C. lyallii*. Some of the larger herbaceous species, which form stout 'pseudostems' from the overlapping persistent petioles of their broad rosette leaves, are also sufficiently restrained for the rock garden or raised bed, such as *C. spectabilis* in its smaller forms, *C. traversii*, *C. verbascifolia*, *C. holosericea* and *C. monroi*.

The largest pseudostemmed species are too big for most rock gardens,

and are best used as spectacular feature plants at the back of the peat bed, amongst rhododendrons, in woodland gardens, or at the front of a shrub border. *C. semicordata* in its many forms is the best known, but *C. hookeri*, *C. armstrongii* and *C. mackayi* are valuable plants in this context.

Finally, for the expert plantsman who likes a real challenge, and grows with the 'new and rare' classes in mind, *Celmisia* still has much to offer. There are several intriguing and attractive high alpine species which to date have proved intractable in cultivation, such as *C. philocremna*, *C. macmahonii*, *C. cordatifolia* and *C. haastii*.

Cultivation

In the British Isles, *Celmisias* have the reputation of growing more readily in the cooler west and north, and the superb collections at the Royal Botanic Gardens, Edinburgh, at Inverewe, or at Glasnevin would seem to bear this out. However, many species thrive at Kew and Wisley (for instance), and in my own garden at Hexham, Northumberland, most species have survived well in full sun, even after long periods with shade temperatures above 30°C in the trying summer of 1989. However, it may be that some of the more temperamental species enjoy peat-bed cultivation, partial shade and regular watering during hot spells in the warmer and drier regions.

With the exception of a few lowland species to be noted later, most species seem extremely frost-hardy, as the excellent collection at Inshriach testifies. *Celmisia* seems to be blessedly immune to most pests and diseases, although the buds and flower stems of some can be martyrs to aphids. After heat stress, some of the larger species are occasionally prone to a basal rot, but with good drainage this is rarely a major problem. If caught early, it can be cured by scraping away the infected areas, dusting with a systemic fungicide, and treating healthy remains as cuttings.

As with so many rock garden plants, the chief requirements of most *Celmisias* are good light, good air movement, good drainage and a light, open, water-retentive compost. However, some of the large-leaved species are best placed in a relatively sheltered position where their leaves escape wind damage. Few, if any, require winter protection, and in general they grow better outside than in the dry air of the alpine house.

For many species, composts varying from almost pure peat (valuable for propagation) to extremely stony screes can be successful, but very few enjoy 'ordinary garden soil'. They do not enjoy rich composts, with much nitrogen and phosphate, which can cause them to flower poorly, grow lax and rot. Although I have no direct evidence, I also suspect that they dislike lime. None of the major collections occur in lime-rich areas.

The smaller species grow quite well in plastic pots with a peaty, gritty compost, but seem to be less successful in clay pots. They are best grown



Fig. 1 *Celmisia argentea* (p23)

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Fig. 2 *Celmisia sessiliflora* (p23)

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Fig. 3 *Celmisia angustifolia* (p25). *C. semicordata* (left) (p31) and *C. spectabilis* var *lanceolata* (bottom left and right) (p29) are also shown.

John Richards

Fig. 4 *Celmisia haastii*, Old Man, Otago, New Zealand (p25)

John Richards





Fig. 5 *Celmisia bonplandii* (p26)

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Fig.6 *Celmisia bellidioides* (p26)

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Fig. 7 *Celmisia gracilentia* (p27)

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Fig. 8 *Celmisia prorepens* (p28)

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plunged outside, in a semi-shaded location in the summer, but in full light in the winter, uncovered. They should not be fed, although they enjoy regular repotting. *Celmisias* seem immune to root disturbance.

Propagation

Celmisias are amongst the easiest species to propagate from cuttings. These can be taken at any time of year (although the late spring is probably the most successful). Strip (don't trim) stems of the dead and lower leaves, and insert into pure damp peat, preferably straight into the peat bed in the open garden. Even species with pseudostems and cushion species root well this way. As long as the peat doesn't dry out, almost every cutting roots rapidly in these conditions.

The complaint is frequently heard that *Celmisias* grow poorly from seed. In fact, fresh fertile seed germinates rapidly and very well, but stored seed (often 12 months old if collected in New Zealand) germinates very erratically, if at all, the following spring. No germination occurs after this and the pot can be discarded. Seed should be sown with the pappus, ideally as soon as it is ripe, covered with grit and plunged in an open but shaded frame.

It is probable that all *Celmisias* are totally self-incompatible, that is they only set fertile seed after pollination by another individual. As a result, both in the wild and in the garden, it is common to find that most if not all seed is sterile. I once examined 125 heads of *C. hectori* in the wild and found one fertile seed! Unfortunately, most species form attractive 'clocks' even if no fertilisation has occurred, and these are often collected and distributed as fertile seed. Fertile seeds have a plump and greyish body. Infertile ones are much the same size, but the body is thin and sandy or brown in colour.

Hybridisation and taxonomy

Also as a result of their self-incompatibility, if only one clone of a species is grown in the company of other species, seedlings will almost certainly be hybrid. Many *Celmisias* hybridise readily with related species, not only in cultivation, but also in the wild where up to ten species can grow together. Understandably, hybrid seed is usually distributed and grown under the parental name, although the resulting hybrid may look very different from its mother. Fortunately, species are so readily propagated vegetatively that there is no need to grow plants from seed. If a grower requires correctly named plants, perhaps he should restrict his seed-sowing to wild collected material; and even that may be hybrid!

Unfortunately, many plants in the British Isles are grown under the wrong name. There are many causes for this, quite apart from hybridisation. The underlying reason is perhaps the remoteness of New Zealand, so that few British growers have had the fortune to see the species

in the wild. The taxonomy of some areas of the genus is rather critical, and has benefited greatly from revisions by D. R. Given in recent years. However, British material often originated from earlier collections, and many cultivated plants are grown under incorrect names even in New Zealand.

Also, it appears that at times the names of early British accessions were lost, or exchanged, so that wrongly named plants were acquired and distributed through the trade. The extreme case of this is the so-called 'C. webbii' which is not uncommonly obtainable in Britain. This name is unknown in New Zealand, or indeed to science! Most material seems to refer to *C. walkeri* hybrids, so we can presume that some early recipient lost the name, and misremembered it!

The present account is based on H. H. Allan's excellent account in the 'Flora of New Zealand' (Vol.1), augmented by the writer's experience of most of the species in the wild or in the gardens of expert New Zealand growers, notably that of the late Jim le Comte.

Key

Although it is not usual for articles in horticultural journals to include identification keys, I feel that in this case it is warranted by the confusion experienced, especially in the British Isles, over the correct naming of *Celmisias*. I have attempted to minimise technical terms in this key, which is confined to species which are or have been in cultivation.

1. Plants forming cushions or tight mats; leaves needle-like,
not exceeding 2cm **Group 1** (5)
If plants cushion or mat-forming, then leaves not needle-like,
or longer than 2cm 2
2. Sub-shrubs with woody stems 3
Herbaceous plants forming pseudostems from leaf bases 4
3. Leaves arranged all along the branches **Group 2** (8)
Most living leaves confined to a terminal rosette **Group 3** (12)
4. Leaves not exceeding 1cm in width **Group 4** (22)
Leaves exceeding 1cm in width **Group 5** (31)

Group 1

5. Flowers on slender stems of about 6cm 6
Flowers stemless 7
6. Leaves about 1mm wide: flower stems not red **1** *C. laricifolia*
Leaves about 1.5mm wide, flower stems dark red **2** *C. similis*
7. Leaves less than 1cm **3** *C. argentea*
Leaves more than 1cm **4** *C. sessiliflora*

Group 2

8. Leaves about 1.5 x as long as wide **5** *C.brevifolia*
Leaves at least 3 x as long as wide 9
9. Scrambling subclimber, leaves about 4cm **6** *C.walkeri*
Low shrub, leaves less than 3cm 10
10. Low woolly cushion **7** *C.philocremna*
Sprawling low shrub 11
11. Leaves green and sticky on both sides **8** *C.lateralis*
Leaves white and hairy below **9** *C.ramulosa*

Group 3

12. Leaves silver or white on both surfaces 13
Leaves not silver or white above 15
13. Leaves about 6mm wide, stiff **10** *C.hectori*
Leaves more than 10mm wide, flexible 14
14. Leaves woolly beneath **11** *C.allanii*
Leaves satiny beneath **12** *C.incana*
15. Plant forming buff to orange cushion **13** *C.macmahonii*
Otherwise 16
16. Leaves not exceeding 12mm in width 17
Leaves exceeding 13mm in width 20
17. Leaves rigid, recurved, sticky, bright green above **14** *C.viscosa*
Leaves never bright green above 18
18. Leaves not exceeding 6mm in width **15** *C.angustifolia*
Leaves exceeding 7mm in width 19
19. Flowering stems white-woolly **16** *C.discolor*
Flowering stems hairless **17** *C.du-rietzii*
20. Dwarf, leaf mid-rib silver below **18** *C.haastii*
Larger, leaf mid-rib blackish below 21
21. Leaves about 3 x as long as wide **19** *C.bonplandii*
Leaves about 6 x as long as wide **20** *C.lindsayi*

Group 4

22. Leaves not more than 3 x as long as wide **21** *C.bellidioides*
Leaves linear 23
23. Leaves rigid, sharp **22** *C.lyallii*
Leaves flexible, not sharp 24
24. Leaves not exceeding 3cm **23** *C.alpina*
Leaves much longer 25

25. Leaf margin flat **24** *C.graminifolia*
 Leaf margin inrolled 26
26. Upper leaf surface lacking a 'pellicle' (whitish
 membrane like covering which erodes) (Australia) 27
 Upper leaf surface with a pellicle (New Zealand) 28
27. Leaves about 8 x 0.3cm **25** *C.asteliaefolia*
 Leaves about 13 x 0.6mm **26** *C.longifolia*
28. Leaves more than 5mm wide **27** *C.major*
 Leaves less than 5mm wide 29
29. Leaves about 4mm wide; pellicle and leaf-sheaths
 golden **28** *C.vespertina*
 Leaves 2-3mm wide; pellicle and leaf-sheaths
 whitish 30
30. Leaves flaccid, the upper surface usually mottled;
 flowering heads less than 2cm across **29** *C.gracilentia*
 Leaves stiff, the upper surface grooved; flowering
 heads more than 2cm across **30** *C.spedenii*

Group 5

31. Rosettes produced singly from creeping rhizomes;
 leaves oblong, often wrinkled, toothed and sticky 32
 Rosettes tufted; leaves rarely toothed, smooth 34
32. Leaves satiny white beneath **31** *C.densiflora*
 Leaves green beneath 33
33. Leaves about 4 x 1.5cm **32** *C.prorepens*
 Leaves about 2 x 1cm **33** *C.glandulosa*
34. Leaf-margins not hairy, distinctly toothed 35
 Leaf margins usually hairy, entire 37
35. Leaves about 2cm wide **34** *C.hieracifolia*
 Leaves about 4cm wide 36
36. Margin and underside of leaf orange-buff to whitish;
 flowering heads rarely exceeding 4cm diameter **35** *C.dallii*
 Margin and underside of leaf gleaming white;
 flowering heads about 6cm diameter **36** *C.holosericea*
37. Leaves glabrous, pale green beneath **37** *C.mackaui*
 Leaves hairy, at least beneath, buff to white beneath 39
38. Leaf margin orange; underside pale buff to orange 39
 Leaf margin and underside white to creamy-buff 40
39. Leaves less than 3 x as long as wide **38** *C.cordatifolia*
 Leaves about 4 x as long as wide **39** *C.traversii*

40. Undersides of leaves thickly felted with buff to white hairs; leaf margins recurved, without a fringe of hairs 40 *C.spectabilis*
 If leaf undersides felted, then margins flat and fringed with hairs 41
41. Leaves more than 15 x as long as wide, longitudinally ribbed, stiff, the apex sharp 42
 Leaves not more than 10 x as long as wide, usually flat, flaccid to stiff 43
42. Leaves with two longitudinal orange bands on the upper surface 41 *C.armstrongii*
 Leaves dull green above, white below 42 *C.petriei*
43. Leaves at least 3cm wide, velvety white to buff beneath, hairy above but lacking a pellicle 44
 Leaves 1-6cm wide, satiny white beneath, without hairs above, but usually with a membrane-like pellicle 45
44. Leaves less than 5cm wide; flowering heads less than 5cm in diameter 43 *C.verbascifolia*
 Leaves usually more than 5cm wide; flowering heads 6-10cm diameter 44 *C.hookeri*
45. Leaves less than 1.5cm wide 46
 Leaves more than 1.5cm wide 48
46. Leaves slightly recurved, spreading, lacking a pellicle above 45 *C.sericophylla*
 Leaves straight, stiff, erect, with a membrane-like pellicle above 47
47. Leaf-sheath greenish, leaf-stalk indistinct 46 *C.monroi*
 Leaf-sheath purple, leaf stalk distinct 47 *C.dubia*
48. Leaf-sheath greenish, leaf-stalk indistinct, leaves fairly stiff 48 *C.semicordata*
 Leaf-sheath purple, leaf stalk distinct, leaves flaccid 49 *C.morganii*

Systematic account

This account is restricted to species which are or have been in cultivation. A few species which were in cultivation for only a short time, e.g. *C. inaccessa*, *C. coriacea* (= *C. lanceolata*) have been omitted. New species are entering cultivation from time to time, especially in New Zealand, and this list is almost certainly not up to date. However, all species well established in cultivation can be found here.

A few diagnostic characters are listed for each species, followed by brief comments on the ecology and distribution of the species in the wild, and on their status and usefulness in cultivation. NI = North Island of New Zealand, SI = South Island.

Group 1. Cushions or mats with short needle leaves

1. *C. laricifolia*

A tiny plant, forming dense prostrate woody mats bearing erect linear leaves of about 1 x 0.1cm, dark slate-grey above and silvery below. Delicate funnel-shaped flowering heads are borne on slender 6cm stems. Alpine localities including tundra, throughout much of SI. Very slow growing and uncommon in cultivation, but a charming trough plant when established. Easily confused with the non-woody *C. alpina* which has longer leaves.

2. *C. similis*

Closely related to *C. laricifolia*, but with wider more silvery leaves and dark red stems. Alpine localities, mostly above 1000m in a restricted area of NW Nelson. Only described in 1969. Very rare in cultivation; a promising trough plant.

3. *C. argentea* (Fig. 1, p.14)

Forms dense hemispherical silvery cushions of tiny needle leaves; rosettes about 1cm diameter. The stemless flowering heads are usually sparsely borne and somewhat unevenly formed, but this unmistakable plant is an outstanding subject when well grown. Alpine bogs and tundra, S. Otago and Southland. Easily propagated, and vigorous when young, especially in peat, but liable to uneven dieback especially after hot weather, and easily lost if not repropagated. Appreciates copious watering in summer and winter; flowers best in full light; tends to find troughs too dry, but a good show plant in a plastic pot. In peat grows well, but tends to be uprooted by birds.

4. *C. sessiliflora* (Fig. 2, p.14)

Like a larger version of *C. argentea*, the rosettes are about 3cm diameter, and usually less silvery. The best forms (e.g. 'Mt. Potts form') are, however, neat and silvery, and *C. argentea*, distinct in cultivation, may be no more than a highly condensed southern version of this more widespread species. Alpine localities throughout SI. More heat and drought resistant than *C. argentea*; an excellent trough and pan subject, but flowers best in peat in full sun.

Group 2. Dwarf shrubs with living leaves along the branches

5. *C. brevifolia*

A small prostrate shrub with short oblong leaves of about 1.2cm, pale olive above, white beneath, and short slender stems of about 6cm.

Alpine grassland and tundra in central Otago. Rare and apparently difficult in cultivation, probably best in peat.

6. ***C. walkeri***

A sprawling or even climbing shrub, stems to 2m with narrow greyish grooved toothed somewhat sticky leaves. Sheltered bushy places in the high rainfall area to the west of the divide, SI. Plants under this name, or '*C. webbii*' in Britain seem not to be true, but may be hybrid, possibly with *C. angustifolia*, and include more than one entity. One form seems to be slow and difficult, but another is easy and almost too vigorous for the rock garden.

7. ***C. philocremna***

This forms cushions of tiny, sticky toothed, inrolled leaves, dark green above, but felted buff to cream below, reminiscent of *Dionysia aretioides*. Restricted to crevices in a few cliffs at the head of Eyre Creek, W. Otago (a remote and very wet area where it was first discovered in the 1960s). Introduced on several occasions, but now probably extinct in cultivation, perhaps because its exciting appearance caused it to be treated as an alpine house plant. If future opportunities arise, good drainage should be accompanied by copious watering and a humid atmosphere.

8. ***C. lateralis***

A rather unexciting stiffly branched shrub with narrow green sticky cylindrical leaves. Rocky sites in Nelson and Marlborough. Rare and unimportant in cultivation.

9. ***C. ramulosa***

A low shrub with stout stiffly branched stems bearing stubby cylindrical crowded leaves and rather small daisies on shortish slender stems. The greenish *C.r.* var. *ramulosa* is less interesting and more uncommon in cultivation than *C.r.* var. *tuberculata* from the drier eastern side of SI which has dark grey leaves decorated with silvery knobs. Alpine localities in SI. An easy and unusual foliage subject for the rock garden.

Group 3. Dwarf shrubs with living leaves confined to the terminal rosette

10. ***C. hectori***

A low shrub with stout stiffly branched stems bearing brilliantly silver-plated stiff narrow leaves; smallish daisies are borne on narrow stems. An extremely distinctive and decorative plant, somewhat resembling *Euryops acraeus* vegetatively. Rocky alpine habitats in the southern two-thirds of SI. Slow and not always easy in cultivation, enjoying wet climates, but a wonderful foliage subject for the trough

or scree when suited; the flowers are disappointing.

11. ***C. allanii***

A vigorous rounded dwarf shrub, rapidly growing to 1m across; leaves oblong, whitish woolly on both surfaces; flowering heads on slightly overlong narrow stems of 10cm, but very attractive. Alpine herbfield in Nelson and Marlborough. A superb garden plant for foliage and flowers, best suited to the larger rock garden, which is often confused with *C. incana*. A.M. 1990.

12. ***C. incana***

Similar to *C. allanii*, but the leaves satiny rather than woolly below, even more brilliantly white on both surfaces, much slower and more congested in cultivation. Montane habitats in NI and northern SI. The true plant is much less common and vigorous than *C. allanii* in cultivation; most plants under this name are *C. allanii*, or *C. angustifolia* hybrids. A brilliant foliage subject for the trough or scree.

13. ***C. macmahonii***

Related to *C. allanii*, but totally distinct, forming loose orange-woolly cushions of congested rosettes. Only known from the summit of Mt. Stokes, SI. A potentially exciting challenge, but apparently difficult and scarcely in cultivation.

14. ***C. viscosa***

Leaves stiff, linear-oblong, recurved, shiny dark-green and grooved above, satiny white beneath, sticky. Alpine herbfields and tundra, much of SI. The true plant is rare and apparently difficult in cultivation; most plants so-named are hybrids of *C. angustifolia*, possibly with *C. viscosa*.

15. ***C. angustifolia*** (Fig. 3, p.15)

Similar to *C. viscosa*, but leaves grey-green above, shorter, less recurved. Many vigorous plants so-named in cultivation are hybrids, perhaps with *C. viscosa* and *C. walkeri*. The true plant from alpine fellfield in Canterbury and Otago is fairly restrained and rather dwarf. It is a quietly interesting plant for the front of the peat bed or a raised bed.

16. ***C. discolor***

Leaves oblong, 3cm, grey-green above, white below; flowering stems white-woolly. SI, widespread. Uncommon and undistinguished in cultivation.

17. ***C. du-rietzii***

Similar to *C. discolor*, but leaves 5cm and flowering stems hairless. Montane grassland, SI. Uncommon, but easy-going in cultivation.

18. ***C. haastii*** (Fig. 4, p.15)

A squat creeping shrub with short stout branches at soil level forming rosettes of shortly oblong leathery furrowed leaves, white below, the

margins somewhat recurved and minutely toothed; the flowering heads are borne on short stout woolly stems and are relatively large, dense and handsome. Alpine localities, especially tundra in SI. A very attractive plant which is rare and probably difficult in cultivation; may be best in peat.

19. ***C. bonplandii*** (Fig. 5 p.16)

A vigorous shrub, growing 1m across and 20cm high in cultivation; the ovate leathery leaves are dark green above and satiny white beneath with a blackish midrib; relatively large and attractive flowering heads are borne on sticky slender stems of 20cm. Montane habitats in the southern half of SI. Easy and widespread in cultivation; an excellent and attractive plant for the larger rock garden or wall.

20. ***C. lindsayi***

Similar to *C. bonplandii* but with longer narrower leaves and shorter flowering stems. Coastal cliffs of Otago and Southland. Rare in cultivation and possibly tender, but potentially a usefully less vigorous counterpart to *C. bonplandii*.

Group 4. Herbaceous plants forming pseudostems, with leaves less than 1cm wide

21. ***C. bellidioides*** (Fig. 6, p.16)

Totally distinct, the only small creeping herb in cultivation, forming mats of rosettes of small rounded dark green shiny leaves. The pleasing and relatively large daisies are borne on short slender stems. Wet rocky and gravelly places, especially stream and river gravels throughout SI. Widespread and not difficult in cultivation, but shallowly rooted and often lost in dry spells. A moderately attractive subject for the front of the peat bed. Two similar and related local endemics, *C. thomsonii* from the Eyre Mountains and *C. parva* from W. Nelson seem not to be in cultivation, but might be worth trying.

22. ***C. lyallii***

Another very distinct species, the 'false spaniard', indeed superficially resembles an *Aciphylla* vegetatively with tall rosettes of hard sharp-pointed narrowly linear erect leaves; the flowering heads on 20cm stems are uninteresting. Montane grassland throughout SI. Fairly easy-going in peat, unusual in cultivation, but sometimes grown as a curiosity.

23. ***C. alpina***

A tiny plant, creeping and forming little tufts of short erect needle leaves about 2cm long; superficially resembles *C. laricifolia* which however has woody bases; a scaled-down *C. gracilentia*. Bogs and tundra above 900m throughout SI. Rare and slow in cultivation, possibly worth growing for the attractive snow-white funnel-shaped flowering heads. Too small for the open garden, but a possible subject for pan culture or a peaty shady trough.

24. ***C. graminifolia***
 A *C. gracilentata* relative, but rather larger, with woollier flowering heads, and with the leaf-margins not recurved. Widespread in lowland grassland, NI, SI. Only occasionally met with in cultivation and possibly not entirely hardy.
25. ***C. asteliaefolia***
 The three Australian species are closely related, all forming tufts of narrow leaves, grey above and silver beneath. They differ from most of their New Zealand relatives (*C. vespertina* looks otherwise very similar, although tinted golden) in having no membranous pellicle on the upper leaf surface; all have attractive funnel shaped snowy white flowering heads and are easy-going and worthwhile subjects for the front of the peat bed or for a raised bed. *C. asteliaefolia* is the smallest of the three (leaves about 3mm wide and recurved), and comes from alpine herbfield in south-east Australia and Tasmania.
26. ***C. longifolia***
 Another Australian, from wet grasslands in the Blue Mountains of NSW; leaves about 6mm wide, more or less straight. Quite widespread in cultivation.
27. ***C. major***
 Forms tufts of narrow straight leaves, green above and silver below with recurved margins. *C. major* var *major* from low-lying grasslands around Auckland is a relatively robust plant with leaves about 1cm wide, but is very probably not hardy. The much smaller *C. major* var *brevis* from alpine grasslands on Mt Egmont (NI) is more suitable, and grows well at the front of the peat bed, although from a garden viewpoint it is similar and probably inferior to *C. gracilentata*, *spedenii*, *vespertina* and *asteliaefolia*. It has wider, greener, straighter leaves than these.
28. ***C. vespertina***
 A lovely plant forming tufts of narrow somewhat curved leaves with an inrolled margin; the golden-orange sheaths and golden pellicle lend an imagined touch of the setting sun in its western fastnesses as implied by the name. Only described from high alpine grasslands (with a very high rainfall) in central Westland in 1969, but quite widespread there. Unfortunately very rare in cultivation, and may prove difficult. Should be tried in peat and may succeed in Atlantic areas.
29. ***C. gracilentata*** (Fig. 7, p.17)
 Forms tufts of narrow (2-3mm wide) inrolled leaves which are flaccid and prostrate or ascending; the upper leaf surface is not grooved, and varies from dark green to a variety of brownish or leaden tints, often attractively mottled paler and covered with a silvery eroding pellicle; the undersurface is silky-white. Very variable, and if grown as a foliage subject it is worth selecting a good form; some have a curiously

reptilian appearance. Widespread in the mountains, NI and SI. An increasingly popular foliage subject at Shows; also suitable for a peaty trough. Has narrower leaves than most of its relatives.

C. x linearis is a name given to a group of hybrids frequently found in the mountains of SI. These probably mostly have the parentage *C. gracilenta x sessiliflora*. The best make very attractive tufts of narrowly linear erect silvery leaves and most closely resemble *C. spedenii*, which is usually a bigger, stiffer plant with grooved leaves. They are occasionally found in cultivation.

30. ***C. spedenii***

Close tufts of erect silvery linear leaves which are characteristically stiff and grooved. Alpine localities on the drier eastern side of SI, chiefly in Canterbury. Scarce in cultivation, but well established in NZ and potentially an attractive plant for the rock garden or peat bed.

Group 5. Herbaceous plants forming pseudostems, with leaves more than 1cm wide.

31. ***C. densiflora***

A creeping plant with rosettes of leathery, pale green, bumpy, bluntly toothed, hairless, oblong leaves, about 8cm long, satiny white beneath. The sticky 20cm flowering stems are purplish. Mountain grassland, much of SI. Unusual and unexciting in cultivation.

32. ***C. prorepens*** (Fig. 8, p.17)

Similar to *C. densiflora*, but smaller, leaves about 5cm, and leaves green beneath. Confined to high plateaux in central Otago. Fairly widespread in cultivation; not difficult but slow and restrained; an interesting subject for the peat bed. Grows in the wild with *C. haastii*, *C. viscosa*, and *C. brevifolia* and is apparently the most tractable of these tundra species.

33. ***C. glandulosa***

Similar to *C. densiflora* and *C. prorepens*, but leaves still smaller, about 2 x 1cm. Widespread in a variety of lowland and upland localities on both islands of NZ. Rare in cultivation and probably unexciting.

34. ***C. hieracifolia***

Forms clustered rosettes of thin but tough, smooth olive-green leaves, oblong, hairless above, satiny orange to cream underneath, the margins toothed. Montane localities, NI and Nelson. A variable plant in the wild; good dwarf orange-backed forms have been in cultivation, but proved slow and possibly not fully hardy; potentially a good foliage plant for the trough or exhibition pan.

35. ***C. dallii***

A much larger and more robust relative of *C. hieracifolia*; the toothed leaves of which are at least 4cm wide. They are usually a delightful rusty orange beneath, contrasting well with the olive upper surface.

C. traversii, also orange beneath the leaves, has leaves felted beneath, hairy leaf margins and woolly orange flower stems (the stems are sticky but virtually hairless in *C. hieracifolia* and *C. dallii*). Montane grassland, W. Nelson. Rare in cultivation, and unfortunately apparently difficult and not persisting. A magnificent foliage plant when well grown.

36. ***C. holosericea***

Resembles *C. dallii* in many ways, with wide thinly leathery toothed leaves, glabrous above and satiny beneath, but shining white beneath, and with huge flowering heads 6.5-7cm across. A spectacular plant. Coastal to subalpine zones of Fjordland. Uncommon in cultivation, but well established in west Scotland; useful in the peat bed or the larger rock garden. However, some plants so-named are quite different, having a pellicle on the leaf upper surface, and margins and undersurface of leaves velvety. They are probably *C. verbascifolia* and *C. semicordata* hybrids.

37. ***C. mackaui***

Huge, perhaps the biggest *Celmisia*, and totally distinct with floppy hairless leaves, sea-green beneath; the large flowering heads often fade purplish. Rocky places near the sea, Akeroa peninsula, east of Christchurch; now very rare in the wild. Rare in cultivation, but an undemanding and attractive plant which does well in sheltered cool sites such as the north-facing foot of a wall.

38. ***C. cordatifolia***

Forms dense tufts of leathery ovate leaves, not more than 12cm long, dull green and pleated above, velvety with rusty-orange hairs on the edges and beneath; the stout flowering stem is also orange. Shaded peaty places on a few mountains in Marlborough and Nelson. An extremely attractive plant, but as yet scarcely in cultivation. In effect, it is a dwarfed version of *C. traversii* with more rounded leaves.

39. ***C. traversii*** (Fig. 10, p.35)

Similar to *C. cordatifolia*, but with ovate-lanceolate leaves more than 12cm long. This beautiful plant has a curiously disjunct distribution on SI montane grassland, occurring southwards to N. Canterbury, and again 400km to the south in Fjordland (where it was originally called *C. praestans*). The true plant is very rare in cultivation; plants under this name are sometimes grown and offered. They have orange leaf margins, but cream to buff leaf undersides and flowering stems, and are probably hybrids with *C. verbascifolia*. *C. traversii* and its hybrids make superb plants for the front of the peat border, or a cool scree.

40. ***C. spectabilis***

Leaves lanceolate, not more than 2.5cm wide, leathery, often shiny green, furrowed above, thickly fawn to white felted beneath, the

margins hairless, turned down; flowering heads untidy and rather small in most forms. Widespread and common throughout the mountains of both islands of NZ. Very variable; var *spectabilis* is relatively small, the leaves not exceeding 12cm, felted pale buff to cream below. Var. *magnifica* and var. *lanceolata* have longer leaves; var. *lanceolata* has leaves white beneath – this is apparently the plant known as var. *magnifica* in cultivation. The true var. *magnifica* has leaves felted buff beneath. Both var. *spectabilis* and var. *lanceolata* are widespread and easy-going in cultivation, and make interesting feature plants suitable for a variety of sites in the garden. *C.s.* var. *spectabilis* becomes rapidly congested and appreciates regular division. Many garden plants labelled *C. spectabilis* are hybrids with, or forms of *C. semicordata* and lack the characteristic combination of the felted leaf underside and turned down leaf margin of *C. spectabilis*.

41. ***C. armstrongii***

Has long, very narrow erect stiff spear-shaped leaves, which characteristically bear two longitudinal orange stripes down the silvery yellow upper surface. Herbfield throughout SI, but rather local; not Fjordland. Rare in cultivation, and rather slow, but eventually makes a striking feature in the peat bed. Similar plants with wider leaves from Fjordland are correctly known as *C. coriacea* (= *C. lanceolata*) and must not be confused with '*C. coriacea*' of cultivation which is correctly *C. semicordata*.

42. ***C. petriei***

Resembles *C. armstrongii* in shape and size, but leaves even stiffer with a sharp point (*C. lyallii* has much narrower leaves), and lacking orange stripes, silvery. Widespread in a variety of habitats, some lowland, in SI. Rare and probably unexciting in cultivation.

43. ***C. verbascifolia*** (see cover plate)

Large rosettes of ovate-lanceolate leaves are dull green and sparsely hairy above (lacking a pellicle) and are felted cream to buff below with marginal leaf hairs; leaves are much wider than in *C. spectabilis* and lack the turned down and hairless margin of that species. *C. semicordata* does not have leaves felted beneath, and has a pellicle above. A very variable species of coastal and montane habitats from N. Canterbury southwards. Small plants with purple petioles were formerly called *C. petiolata*. Subspecies *rigida* (formerly *C. rigida*) has narrow erect silvery leaves, and is confined to Stewart Island. True *C. verbascifolia* is scarce in cultivation, but is robust and easy-going in sheltered peaty sites. Hybrids occur in cultivation with *C. semicordata*, *C. traversii* and possibly with *C. spectabilis*. All are worth growing.

44. ***C. hookeri*** (Fig. 9, p.34)

Similar to *C. verbascifolia*, but altogether more spectacular, with wider

leaves (more than 5cm) and huge flowering heads, between 6 and 10cm across (up to 5cm in *C. verbascifolia*). Dry lowland or submontane localities in NE Otago, now uncommon. Not uncommon in cultivation, and a spectacular subject for a sheltered wall-base.

45. ***C. sericophylla***

The largest of the Australian species, and like the others with narrow silvery leaves lacking a pellicle above; leaves recurved, spreading, about 1.3mm wide; heads relatively slender, snowy white, funnel-shaped on ascending stalks. Tasmania. Grows well in the peat bed where it makes an excellent foliage feature plant.

46. ***C. monroi***

Rosettes consist of stiff erect furrowed silvery leaves about 10 x 1cm, which in common with the next three species have a membranous pellicle above and silky white hairs beneath, the leaf-margin turned down; in many ways a scaled-down *C. semicordata*. Alpine habitats in Marlborough, and N. Canterbury. Scarce in cultivation, but a reliable subject which makes an attractive feature more in scale with the smaller rock garden than *C. semicordata*.

47. ***C. dubia***

Very similar to *C. monroi*, but with a purple leaf-sheath, and a distinct purple leaf-stalk; the flower heads are smaller. Montane grasslands, Nelson and N. Westland. Rare in cultivation, but I recently obtained it from seed labelled *C. monroi*, and it is proving a reliable and attractive plant for the rock garden.

48. ***C. semicordata*** (Fig. 11, p.35)

A robust plant, forming sizeable clumps of spear-shaped leaves, with a silvery or golden pellicle above, silky-white below; dense showy heads of some 6cm diameter are borne on stout white stems. A widespread and variable plant commonly found in a wide variety of montane habitats in SI. A distinct form with recurved leaves forming a spreading rosette is widespread in cultivation under the name 'Secretary Island form' (Fjordland). It looks a bit like *C. sericophylla* vegetatively (but not in flower), but has a pellicle. *C.s. aurigans*, with a beautiful golden pellicle from central Otago and Southland is becoming commoner in cultivation, as is *C.s. stricta* from W. Otago and adjoining Southland. This has stiff narrow silvery leaves, and is in some senses intermediate with *C. monroi*. Many hybrids of *C. semicordata* are grown, some knowingly, as in the excellent 'Inshriach Hybrids' raised by Jack Drake which probably include genes of both *C. verbascifolia* and *C. traversii*. All are superb vigorous garden plants which make excellent features for the larger peat garden or rhododendron bed. Many plants in cultivation labelled '*C. spectabilis*',

'*C. holosericea*', '*C. verbascifolia*' are either *C. semicordata*, or *C. semicordata* hybrids. None of those three species have a pellicle, or silky hairs beneath the leaves. *C. semicordata* was previously incorrectly known as *C. coriacea* (see under *C. armstrongii*), and most plants in cultivation are still so-labelled.

49. ***C. morganii***

Rather similar to *C. semicordata*, but with limp leaves, green above with only a slight pellicle, and slender green flowering stems. A rare plant from a few localities by streams at low altitudes near Westport, SI. Very rare and possibly not hardy in cultivation. *C. adamsii* from the Coromandel Peninsula, NI, has narrower leaves and is probably not in cultivation.

There are a number of other species probably not in cultivation. A brief synopsis follows:

C. rupestris. A relative of *C. walkeri* from Mt. Peel, Nelson.

C. gibbsii. A relative of *C. ramulosa* from Mt. Cobb, SI.

C. cockayneana. A smaller-leaved version of *C. lindsayi* from the Seaward Kaikoura, Marlborough.

C. sinclairii. The only dwarf shrub in the genus with leaves green and without hairs on both surfaces. From a restricted area in SE Nelson.

C. glabrescens. A local endemic from Stewart Island, related to *C. prorepens*.

C. rutlandii. A small broad-leaved relative of *C. semicordata* from N. Marlborough.

C. insignis. From a restricted area centred on S. Nelson, this species falls between *C. monroi* and *C. spendenii*, and also resembles *C. adamsii*.

C. polyvena. Resembles the hybrid *C. x linearis*, endemic to Stewart Island.

C. inaccessa. Fairly recently described from Fjordland, to the west of Te Anau, rather like a shrubby version of *C. prorepens*. May still be in cultivation in NZ.

A Change of Plan: California and Oregon

CHRISTINE WALKDEN

Any botanical trip takes a great deal of planning and thought, to ensure that everyone gains the maximum from the experience. I had spent 18 months organising a trek for 10 people to South America, when several killings and bombings occurred in the region to be visited. Neither British nor Peruvian Embassies could guarantee our safety, so I was forced into cancelling the trip six weeks before departure. What a position to be in – nine people having paid quite a lot of money, all the disappointment. What could be salvaged? Hundreds of phone calls later, quick action showed how relatively easy it is to re-organise a tour provided you know where to look and who to ask.

The USA is botanically very rich. Having visited Washington, Idaho and Montana previously I knew that the Pacific Coast was a treasure trove for the plant lover. So having selected the country, ensured that botanically it was the correct time of year, where were we to go? Phil Phillips and Michael Upward plus many other SRGC and AGS members were phoned, maps consulted, floras pored over until I selected California and Oregon.

The plan was to fly into Los Angeles, cut across into the San Bernardino Mountains, travel across the Mojave Desert, along the length of the Sierra Nevada and up into Oregon as far as Crater Lake. We would return down the coast of California to Los Angeles visiting good plant locations all the way, between the 17th June and the 10th July.

On arriving in Los Angeles there are several steps which will make your planning and organising much easier. Visit the Local AAA (American Automobile Association) office and obtain maps and tour books of the area you will visit. Call in at Forestry Stations for local detailed maps of treks and walks.

The Floras for the regions are *A California Flora and Supplement* by Munz and Kech, and *A Flora of Southern California* by Munz. Several useful pocket books may also be obtained and the following were most useful: *California Mountain Wildflowers* by Munz; *Wildflowers 3. The Sierra Nevada* by Horn; *The Audubon Society Field Guide to North American Wild Flowers (Western Region)*; *A Field Guide to Rocky Mountain Wild Flowers* by Craighead, Craighead and Davis; *A Sierra Nevada Flora* by Weesten.

Having left Los Angeles with great speed we headed for Redlands, the San Bernardino Mountains and the area around Big Bear Lake. I am told that in March this region is extremely rich but by June/July much of this is burnt up. However we did find *Calochortus nuttallii*, *Argemone*



Fig. 9 *Celmisia hookeri* (p30)

John Richards



Fig. 10 *Celmisia traversii* (p29)

SRGC Davidson Slide Library

Fig. 11 *Celmisia semicordata* var *aurigans* (p31) Old Man, Otago, New Zealand

John Richards





Fig. 12 *Oenothera xylocarpa*, Bridgeport, California (p39)

Christine Walkden

Fig. 13 *Primula suffrutescens*, Onion Valley, California (p39)

Christine Walkden





Fig. 14 *Myosotis alpestris*, Ben Lawers, Perthshire (p46)

Alfred Slack

polyanthemus, *Calyptridium umbellatum* and *Mimulus aurantiacus* ssp *australis*. *Fremontodendron californicum* reminded us where we were just in case the heat and jet lag still lingered.

The following day we made an early start, crossing the extremely hot Mojave Desert, aiming to arrive at Lone Pine by evening. This is a fascinating drive with *Argemone* sp, *Helianthus annuus* and *Yucca brevifolia*, the Joshua tree, adding to the interest.

By mid afternoon we were installed in a motel and some of us went off to Whitney Portal. This is a good road and most of the botany can be done from the car; the area up to 30m from the side of the road will reveal a lot without too much effort.

This drive set the scene for the rest of the trip. Growing in bone dry soil were *Penstemon bridgesii*, *Cryptantha confertifolia* and *Leptodactylon californicum*, the prickly phlox. The flowers which are about 1cm across are borne on slightly woody stems, which bear prickly leaves forming a loose clump. *Eriogonum ovalifolium* var *nivale* was extremely common in this area, as were *Eriogonum umbellatum* and many other eriogonums – when we could not identify something we jokingly said “oh it’s an eriogonum”! Other plants along this stretch were *Sphaerelces coulteri*, *Chamaesaracha nana* and *Nama rothrockii*, which at first we took to be a verbena. Further examination suggested *Polemonium eximium* but it could not be that, so it went down in my field notes as “polemonium-like flower with verbena-like foliage”. Only when I came home did I find out what this lovely plant was. Why is it not in cultivation? It is certainly a plant with ornamental value, with purplish rounded heads of flowers on plants 15–30cm tall, with foliage looking much like verbena.

Our next base was the town of Bishop, from where we visited Onion Valley. The road up to Onion Valley ends at a car park at 3000m where walks lead off to various lakes. The walk we selected was to Robinson Lake. In parts this was quite steep but many exciting plants were present to entice you higher: *Penstemon bridgesii* and *P. newberryi*, *Aquilegia formosa*, *Ledum glandulosum* var *californicum*, *Mimulus primuloides* var *pilosellus*, *Mimulus tilingii*, *Achillea lanosa*, *Monardella odoratissima*, *Habenaria dilatata* ssp *leucostachys*, *Iliamna rivularis* and *Argemone munita*. There were sheets of *Veratrum californicum* and that most impressive plant *Frasera speciosa*, whose common name is the Monument plant. A member of the Gentianaceae, this produces a narrowly cone-shaped plant with a single erect stem up to 1–2m. The leaves are long, in evenly spaced whorls with clusters of green flowers in the axils. What an architectural plant this is.

Growing in the shade and dampness of large rocks, in full flower was *Primula suffrutescens*. Sheets up to 2m by 1m were at their peak. The foliage of this plant looks remarkably like a saxifrage, producing mats of basal rosettes at the end of creeping woody branches. Each flower is about 2cm

across, the five lobes being notched at the end, forming reddish-lavender umbels (Fig. 13, p.36).

From Bishop the White Mountains to the west should not be missed. Spectacular views of the Sierra Nevada can be obtained from this mountain range along with a visit to the ancient bristlecone pine forest. Some of these *Pinus longaeva* are believed to be four thousand years old. Many of these trees have glowing golden wood which is gnarled and formed into the most amazing shaped specimens. Against a barren, harsh landscape of white dry rocky soil, stretching out for miles, the road from Schulmin Grove to Patriarch Grove is a superb sight.

The White Mountains are also botanically rich. Easily seen from the road are *Artemisia spinescens*, *Lupinus breweri*, *Oenothera caespitosa*, *Sphaeralces ambigua*, *Mirabilis multiflora*, *Phlox longiflora*, *Linum lewisii*, *Phlox diffusa*, *Mimulus whitneyi*, *Hymenoxis cooperi* var *canescens*, *Purshia tridentata*, *Monardella odoratissima*, *Gilia capitata*, *Astragalus kentrophyta*, *Oenothera nuttallii* and *Arenaria kingii* var *glabrescens*. Days like this caused me to have few hours of sleep, with long evening rambles through my floras to help me finally track things down.

At Saddleback Lake the ferry across saved a lot of time. The lake had been covered in ice the previous week and the boat taxi had only started to run that day. Unfortunately we were about two or three weeks too early to see the flora around this lovely lake in flower. However we did see *Gentianopsis holopetala*, *Arnica cordifolia*, *Streptanthus tortuosus*, *Wyethia mollis*, *Phyllodoce breweri*, *Kalmia microphylla*, *Allium validum* and several penstemons all beginning into growth.

On the way back to Bridgeport further botanising along the roadside came up with *Sedum obtusatum*, *Brodiaea lutea*, *Iris missouriensis*, *Oenothera hookeri*, *Sisyrinchium bellum*, *Aquilegia formosa* and the lovely, small growing, *Oenothera xylocarpa*. This oenothera was growing in bone dry 'dirt' by the side of the highway. It is a stemless perennial, with leaf-blades densely soft-pubescent, 3 - 6cm long, spotted red, pinnately parted. The bright yellow flowers, 8cm across, turn red as they age (Fig. 12, p.36). From what I can find out this is a local plant growing between 2100 and 3000m from Tulare County to Mono County. I'm sure in cultivation it would be a very attractive plant.

The following morning, just as we left Bridgeport, we came across what best can be described as a meadow almost 2km long and 1km wide just full of dodecatheons. I have never seen anything like this before; thirty or forty plants together maybe, but not a dense sheet of this size.

During the day we travelled over the Sonara Pass down to a place called Kennedy Meadows. The journey took us through woods which held many now-familiar plants, plus a few which turned out to be new. One

such was *Paeonia brownii*. This has rather fleshy, bluish green, divided leaves. The flowers are an attractive greenish to reddish brown, the globose single flowers hanging at the end of each stalk. The plant grew to around 45cm high, and is yet another American plant which I have never seen in cultivation.

What we found on our arrival at Kennedy Meadows was a camp site. Among the campers and their tents grew *Calochortus leichtlinii*; what a lovely plant to camp among! Other new subjects to add to my field notes included *Phacelia hydrophyloides*, *Potentilla glandulosa*, *Geum triflorum*, *Arnica cordata*, *Hackelia velutina*, *Amelanchier pallida*, *Prunus emarginata*, *Astragalus purshii* and *Astragalus whitneyi*, alas only in flower – the spectacular seed pods had yet to form. *Zigadenus venenosus*, *Wyethia mollis* and *Smilacina racemosa* completed the day's sightings.

Finding accommodation for ten people can be quite entertaining when you have not booked, especially when the Fourth of July starts to have influence. Somehow this date did not ring any warning bells for me, but a week either side the 'locals' have their annual break and all forms of accommodation are fully booked. In one motel, when I asked if they had rooms available for ten, the receptionist asked me if I was breeding them! He might well ask! This resulted on more than one occasion in us all sharing one room. Well, they do say adversity brings people together. I'm not sure of that, but ten sharing one shower and loo certainly does! Well let's face it, it was the plants we came to see – not the motels! Eventually we found a 'hut' for all ten of us in a place called Hope Valley. Was it aptly named?

Botanising in the Hope Valley, and over the Monitor and Ebbetts Passes, just west of the Nevada border, allowed us time to find many plants. *Sidalcea oregana* grew in the ditch while *Penstemon newberryi* grew and 'dripped' from every rock high up on the cliffs. We also found a most exciting plant – blood red, looking like a thing from outer space. The books stated "once seen, never forgotten", and they are right. *Sarcodes sanguinea* is short, fleshy and entirely bright red. No leaves, these are represented by scales, and the plant relies entirely on fungal mycorrhizae for its nutrition. The corollas are bell shaped. The plant can grow up to 60cm tall but most of the plants we saw were only 15cm tall. It belongs to the birdsnest family (*Monotropaceae*), which was formerly part of the wintergreens (*Pyrolaceae*) and is called the snow plant. It can be found growing among coniferous woods, from southern Oregon to southern California.

The day also turned up *Mimulus guttatus*, *Gilia aggregata*, *Delphinium glaucum*, *Aster alpigenus*, *Sedum lanceolatum*, *Arctostaphylos uva-ursi*, *Viola adunca* and *Allium campanulatum*. The intensity of the sun was reflected in the bright golden flowers of the state flower *Eschscholtzia californica*. In cultivation this plant never really seems to take on the glow it has in the wild, though nevertheless it is a good addition for the annual border.

Spectacular lakes and snow-capped mountains feature greatly in this part of the USA, and the next trek was over Carson Pass to Frog Lake, Winnemucca Lake and Round Top Lakes. The start is quite steep, but after a short distance it then becomes a pleasant day's walk. Members of the Ericaceae are obvious along this path with *Phyllodoce empetrifomis* growing everywhere and *Cassiope mertensiana* growing in damp spots with plenty of sun, to ripen flowering wood. The path between Frog Lake and Winnemucca Lake was abloom with *Caltha howellii* growing in the snow melt. Sheets of *Calyptridium umbellatum* grew quite happily with the odd plant of *Frasera speciosa*, *Castilleja* sp, *Rhodiola rosea* ssp *integrifolia*, *Heuchera rubescens*, *Phlox diffusa*, and *Hesperochiron californicum*.

The next day was spent mainly driving from Woodfood up to Carson City, through Reno without stopping, up to Susanville, over the Mount Lassen Park, past spectacular views up to the town of Redding.

One of the plants that I particularly wanted to see in the wild was *Darlingtonia californica*. I had been told that this plant grew around the western edge of Castle Lake. This is also a fairly well known location for the small and not so spectacular *Lewisia leana*. We found the lewisia growing up above the lake on the cliff face. It produces tiny rose-cerise flowers on open-branched stems about 15cm tall with up to eight or even ten flowers on each plant. The leaves form loose rosettes from a short thick caudex.

The *Darlingtonia* was also easy to find as it was in full flower, growing on the steep cliffs near the lake's western edge (fig. 33, p.97). This is a carnivorous herb with tubular leaves and large, nodding flowers which are a greenish-red colour. I was thrilled to see this plant and took several photographs to ensure that if it was not seen again it would not matter. My fears were groundless, as over the next few days we were to see thousands in various locations. The common name of Cobra Lily is very suitable.

The area around the lake is rich in good flora and both the pink and white forms of *Rhododendron occidentale* can be seen and smelt – what a lovely strong perfume this plant produces. Other plants seen during the day included *Clintonia uniflora*, *Lilium washingtonianum*, *Rubus lasiococcus*, *Trientalis latifolia*, *Chimaphila menziesii*, *Lilium pardalinum*, *Linnaea borealis*, *Calochortus elegans* and *C. macrocarpus*, *Ceanothus prostratus*, *Brodiaea lutea*, *Spiraea densiflora*, *Heuchera cylindrica*, *Tritelea hyacinthina* in its white and blue forms, *Tofieldia glutinosa*, *Pyrola picta*, *Campanula prenanthoides*, *Arctostaphylos patula*, *Apocynum androsaemifolium*, *Viola lobata* and that tiny member of the Fumariaceae, *Dicentra pauciflora*, only growing about 4 - 6cm tall, but showing all the charm and grace of its larger relatives. The flowers look like stags' heads. I'm sure that this plant would not be considered particularly garden-worthy, but I was most taken by it in the wild.

Mount Shasta dominates this part of the world, and with good accessibility to high levels it is well worth the visit, provided you do not encounter dense freezing mist like we did. *Pulsatilla occidentalis* was found near Panther Meadows, only growing in ones or twos, not like in Washington State where it is found in vast sheets. It is a spectacular plant with silver silky hairs up its stems and over its leaves. The plant grows up to 15cm tall, producing flowers about 2.5cm across – white with a central boss of stamens. Surely one of the most desirable members of the *pulsatilla* clan from this part of the world, it is remarkably difficult, if not almost impossible to grow in cultivation.

Due to the extreme cold and mist we came down from Mount Shasta and drove over to Gumboot Lake. Along the roadside we found *Asarum hartwegii*, *Asclepias speciosa*, *Clematis ligusticifolia* and *Dichelostemma multiflorum* which has the marvellous common name Ookow. *Cornus nuttallii*, *Rudbeckia laciniata*, *Anemone drummondii*, *Narthecium californicum*, *Pedicularis bracteosa*, *Solanum xantii var montanum*, *Linum perenne* and *Anemone oregana* were all present in the area. This stop also gave us the chance to talk to an American member who was researching *lewisias*. It is really strange that you can be in the middle of nowhere and come across an SRGC or AGS member. Roy Davidson was most helpful and was pleased to pass on useful information and good plant locations.

Kangaroo Lake proved to be quite a surprise, not just for the millions of *Darlingtonias* but the fact that this lake must have more toilet blocks around it than the entire highway system through California – a real mess in the making! However if you walk to the far side and climb the steep rock face there are lots of fine plants to be seen. We were now becoming quite familiar with most of them, but the small dark purple *Allium* growing over a distance of almost 1km on top of the cliff foxed me. Only growing 4 - 6cm, with only a tiny part of a leaf showing, this was a nice find.

Lewisias grow in profusion in this part of the USA, if you know where to look. Condry Park and Alec's Hole are marvellous places to see millions of *Lewisia cotyledon* in flower. On the same date the previous year Phil Phillips had found the plants in seed! I had never seen the plant in the wild before, but to see many thousands of *Lewisia cotyledon* turning the hillside pink was out of this world. All plants were the pink candy striped form and we saw no variation at all.

The day was hot and sunny and we got our first sight of Mount Shasta without cloud cover. The screes up to Alec's Hole were just covered in *Lupinus lyallii*, a yellow *Castilleja* sp and *Calyptridium umbellatum* in vast quantities. Within Alec's Hole we also located *Trillium ovatum*, *Erythronium grandiflorum*, *Lewisia leana*, *L. pygmaea*, plus possibly another species, *Phlox diffusa* and *Dicentra formosa*.

From California we made our way into Oregon and went up to Mount Ashland and Dutchman's Peak through forest roads. While making our base in Medford the day was spent up on Whiskey Peak, again a fine spot for the lewisia and also a lovely shell pink *Silene campanulatum* ssp *glandulosum*. I have no knowledge of this plant at all, but its form and colour were most attractive.

One full day was ear-marked for being typical tourists, so we headed off to Crater Lake. This is a fantastic spot, quite an atmosphere. The blue of the water is difficult to believe and the vastness of the lake quite something. We were about two weeks too early for any botany, but if time allows it's a sight well worth seeing.

Our last day for botanising was spent up on Cook and Green Pass. *Veratrum insolitum* grew in 2m spikes. Both *Dichelostemma congestum* and *D. multiflorum* were found, at least three species of blue penstemons, plus many of the goodies which had now become part of the everyday flora.

Three days were spent driving back, stopping off to see the California Redwoods. You feel like an ant while walking through these spectacular forests, while *Lilium pardalinum* grows along the roadside. This really is a part of the west coast trip not to miss. 2,000km back to Los Angeles was quite a drive, but with our minds ablaze with all the plants, colour and views, time quickly passed.

For those who want to botanise easily, this is an excellent and exciting part of the world. The flora is superb, and most roads are quite good for a saloon car, so distances can be covered quickly.

I would like to thank the SRGC for their travel award towards the cost of this trip, and to thank the people whom I contacted in haste, and who gave much useful information and help.



George Don of Forfar (1764-1814)

ALFRED SLACK

Although our Gaelic forebears must have acquired much plant lore over the centuries, there is little recorded history of the flora of Scotland until about the 17th century when Martin Martin and Professor Sibbald made some beginnings. At that time Linnaeus had not introduced his important standardising names so references to particular plants are often not clear.

Travel in the Highlands in the third quarter of the 18th century was becoming easier, and Lightfoot's *Flora Scotica* produced at this time used Linnaeus' names and provided a reasonable base. In fact Lightfoot nearly swept the board, leaving only the less common plants and those more difficult to identify to be 'discovered'.

A feature about this time was the upsurge in gardens and gardening (amongst the wealthy) and in the fourth quarter of the 18th century and into the first quarter of the 19th, a number of nurserymen took a great interest in the wild flora of Scotland, while at the same time learning to grow and propagate many species introduced from areas such as the European Alps.

Four such nurserymen were the two Dickson brothers, John MacKay and George Don, all of whom wandered in the hills of Perthshire, Argyll, Skye, Inverness-shire and Angus in search of plants. Occasionally they went further but distances were limiting on foot or horseback.

George Don was the most persistent. He would go for weeks on end, leaving his wife and family to tend his nursery while he searched crags, moors and summits for unusual plants. He carried a long pole with an adze on the end to dislodge the inaccessible specimens, so it is obvious that he lived before the days of conservation. Exactly how many plants new to the British Isles he found is hard to say, because his rival nurserymen were also making discoveries and it is at times difficult to say who was the first.

Don was born at Dundee in 1764. When he was seven (1771) the family moved to Balamoon. Where exactly this was is not clear, as the gazetteer of 1865 places it 5 miles north of Arbroath, whereas the gazetteer of 1895 states the position as 4½ miles west north-west of Brechin. In 1777 (at the age of 13) he was apprenticed to a clockmaker at Dunblane, and the next year he was working as a journeyman clockmaker at Glasgow.

He abandoned clockmaking the following year (1779) when he began to learn gardening at Dupplin in Perthshire, still at the young age of 15. At Dupplin we hear for the first time of trips to the hills. He visited the Ochils

and the edge of the Grampians. These early trips are not well documented and the plants he noticed were presumably the common ones with which he clearly became familiar. He spent five years at Dupplin and met Caroline Stewart who later became his wife.

In 1784 at the age of 20 he widened his horizons, so for the next five years his time was spent gardening in Worcester, Doncaster and London. He continued to take trips to nearby areas, and in Worcestershire, where he spent four of the five years, he found Hartstongue Fern (*Phyllitis scolopendrium*) and Gipsywort (*Lycopus europaeus*), plants which had not previously been noticed in that county. In 1789 (now 25 years old) he returned to Scotland and married Caroline Stewart. We next hear of him gardening in Glasgow.

1789 appears to be the year when he began 'regular trips' to the Highlands, and in that year he visited Ben Lomond finding Alpine Mouse-ear (*Cerastium alpinum*) and Russet Sedge (*Carex saxatilis*). He had visited Ben Lomond in 1779, but it is unlikely that as an inexperienced botanist of 15 he would recognise these two rather infrequent plants. In 1789 he also visited Maol Ghaordie where he saw Alpine Bartsia (*Bartsia alpina*) and Alpine Pearlwort (*Sagina saginoides*).

He spent three or four years gardening in Glasgow and we hear of trips, some of which are undated, which may have been made during this time, for instance to Ben Vorlich, Schiehallion, Loch Ericht and Loch Nevis, but one dated 1791 was to Forfar (presumably to visit his parents). While there he went to Restenet Mire and recorded the presence of Alpine Cottongrass (*Eriophorum alpinum*). With him on this occasion was the British Museum botanist Robert Brown, who had worked on Joseph Banks' plant collection from Australia. Don also foretold that this colony would become extinct within 10 years because of drainage and this, in fact, came to pass. The Alpine Cotton-grass is now extinct in the British Isles, though some think that it may linger yet in some unexplored corner of the Highlands.

Another trip from Glasgow was to Ben Lawers in 1793, when he saw Mountain Sandwort (*Minuartia rubella*), Snow Gentian (*Gentiana nivalis*) and Chickweed Willowherb (*Epilobium alsinifolium*). On this excursion he had John MacKay as a companion and together they went on to Glen Tilt and encountered Mountain Avens (*Dryas octopetala*) and Hair Sedge (*Carex capillaris*).

1794 saw a repeat performance, going with John MacKay to Ben Lawers again. This time they found Two-flowered Rush (*Juncus biglumis*), Alpine Pearlwort (*Sagina saginoides*), Chestnut Rush (*Juncus castaneus*) and Drooping Saxifrage (*Saxifraga cernua*). This is a very impressive list of plants of very great rarity, and it is worth recalling that Don had previously

found the *Sagina* on Maol Ghaordie. The discovery of *Juncus castaneus* is usually attributed to D. Dickson under the date 1798 and the somewhat inadequate locality "Scotland", but 1798 was the date of publication of the discovery not the date of the actual discovery and this highlights the difficulty of attributing credits accurately. Similarly the credit for *Saxifraga cernua* goes to James Dickson from Ben Lawers in 1794.

Still in 1794 George Don left MacKay and went on to Ben Nevis where he came upon Sea Pearlwort (*Sagina maritima*). This was the first record for an insignificant little annual plant which colonises rather bare areas on exposed sea-shores and mountain tops. I have never seen it on Ben Nevis and only occasionally by the sea. Then he went on to Skye to inspect well-known areas to see Northern Rockcress (*Cardaminopsis petraea*), Pipewort (*Eriocaulon aquaticum*) and others.

By the following year, 1795, he had left Glasgow and was living in Forfar having set up his own nursery. In August he visited Glen Clova and Loch Lee. Again in this year he made an addition to the British flora by finding Alpine Catchfly (*Lychnis alpina*) on a fascinating serpentine outcrop. Two years later, in 1797, he took a 99-year lease of Dovehilllock, north of Forfar, and here he moved his cultivating, setting up a nursery of plants for sale.

Another visit to Ben Lawers was made in 1798 and he found Russet Sedge (*Carex saxatilis*) which he had seen on Ben Lomond 9 years before. However it seems that Dickson had found it in 1797 and the record was published in 1804 under his name. There is a gap here until the end of the century while Don was no doubt busy with his nursery, but some of the undated trips may have been made in 1799 and 1800. In 1801 there was another visit to Clova and Loch Lee, and on to Lochnagar where he found Alpine Sowthistle (*Cicerbita alpina*) and Alpine Foxtail-grass (*Alopecurus alpinus*), both additions to our native flora.

In the following year, 1802, Cullen, Grantown-on-Spey and the Cairngorms received attention. At Grantown he met Creeping Ladies-tresses (*Goodyera repens*) which had previously been seen by Lightfoot in 1772 in a totally different locality in the West. That year of 1802 introduced another great change in Don's life. His friend John MacKay, who had been Principal Gardener at Edinburgh's Royal Botanic Garden since 1800, died and the Gardens asked George Don to take the post. It seems that he did so with some reluctance, but he retained his nursery at Dovehilllock where his father dealt with the work. During this period in Edinburgh we find references to some visits to Arthur's Seat, North Queensferry, Colinton and the Pentlands, but no striking discoveries were made except in 1804 when he fitted in another visit to Ben Lawers and came upon Alpine Forget-me-not (*Myosotis alpestris*) (Fig. 14, p.37). It is surprising that

previous visits by him and others had not revealed this very spectacular plant which about that time and later was said to occur on several of the Breadalbane hills.

In 1807 Don gave up the Edinburgh post and returned to Dovehillock. Characteristically we find him that year on a visit to Lochnagar and Glen Clova. Lochnagar introduced him to Alpine Scurvy-grass (*Cochlearia alpina*) which is now regarded by most botanists as merely a variety of the Common Scurvy-grass (*Cochlearia officinalis*). He also met Highland Saxifrage (*Saxifraga rivularis*) which was not new as Townson had found it on Ben Nevis in 1790, where it is very rare. I have seen it on the Cairngorms, Ben Nevis, the Grey Corries, Bidean nam Bian and An Teallach and it is known on several more of Scotland's highest hills. In Clova however he came upon a colony of a new sedge, the Mountain Bog-sedge (*Carex rariflora*) which is an arctic sedge confined in our islands to high level peaty places in the Grampian area.

1808 and 1809 saw further excursions to the Clova area and Wirran Hill where he thought he had found Alpine Buttercup (*Ranunculus alpestris*), but this has never been re-found on Wirran Hill in spite of visits by a number of botanists including myself, and it seems possible that some mistake may have been made in the labelling of his nursery garden when he brought the specimen back home. All gardeners know how easy it is for some animal such as a blackbird, a squirrel, even the wind to move a nameplate. This incident and others were unfortunate for Don's reputation so that J.D. Hooker in his Student's Flora of 1870 lists 24 species which he consigns to limbo as "one of Don's reputed discoveries". Nevertheless Don was a first class botanist who did champion work.

It is astonishing how repeated visits to some favourite areas can turn up a surprising number of interesting finds. Other botanists including myself have found this. Of course differences in weather, time of year and even time of day can account for passing a plant unseen on one occasion and being immediately attracted to it on another. Be that as it may, Don went to Ben Lawers again in 1810 and there recorded the first Scorched Alpine-sedge (*Carex atrofusca*) to be seen in Britain. This was one of the species consigned to limbo by J.D. Hooker in 1870. However it was re-discovered in 1885 and again in 1892 and is now also known elsewhere in Scotland.

Moving on to 1812 we encounter a bumper year. Glen Clova and Glen Isla were the venues, and an astonishing 4 species new to the British Isles were revealed. The Yellow Oxytrope (*Oxytropis campestris*), Purple Coltsfoot (*Homogyne alpina*), Silvery Lady's-mantle (my invented title for *Alchemilla conjuncta*) and Holy-grass (*Hierochloe odorata*) were disclosed. All four are rare in Scotland, none occur in England or Wales, and of the four only one, the grass, in Ireland.

The Holy-grass is the least rare as it occurred in five areas, though now reduced to four. The Oxytrope was in 2 counties, but in 1960 I was lucky enough to find it in a third. Silvery Lady's-mantle may be native in 2 counties but it has escaped from cultivation elsewhere, and Purple Coltsfoot is only known in one county.

Like the Scorched Alpine-sedge, Purple Coltsfoot was put into limbo by J.D. Hooker in 1870 and remained there for another 80 years. Then in 1951 a chance search on a showery day led me to a colony which may or may not be the identical colony which Don found.

In the same year, 1812, it appears that Don made two other important finds, of the Woolly Willow (*Salix lanata*) in Glen Callater and of the Curved Woodrush (*Luzula arcuata*) in the Cairngorms. He has not however been credited with these two discoveries.

In 1813 he visited the West Highlands, and on his return home he was in a poor state of health. He died early the following year. Two of his five sons became very competent botanists, and were instrumental in informing the botanical world about their father, in particular his last few years. Communications were possibly not as quick then as they are today, and no doubt some information was lost somewhere along the way.

A number of accusations have been levelled at George Don. Some have said that he visited a locality and stripped it of its more interesting plants. No doubt the adze which he carried did a lot of damage, but he often travelled alone and a single collector's destruction can recover before the next visit. The devastation was much worse towards the end of the 19th century, when the Victorian botanists were more numerous and tended to collect overmuch to "exchange" with their friends. This system was actually beginning in Don's day, and he distributed a number of sheets of pressed plants to those who could pay for them.

Another accusation was that he visited an area and "planted" things there which he could later "find". This is not impossible but it is well-known that the chance of a plant growing and surviving in an area already inhabited by a closed cover of established plants is very slim.

Of the 24 plant species discredited as "reputed discoveries" by J.D. Hooker in 1870, six have been rediscovered, they are:

Golden Chervil (*Chaerophyllum aureum*), now known as an introduced plant well established, as at Callander.

A form of Corn Cleavers (*Galium valantia*), is now recognised as occurring casually in corn-fields.

Slender Rush (*Juncus tenuis*) turned up again in 1883 and has increased markedly since then, particularly in West Scotland. This is an American plant which is considered to have found its way here with cargoes coming across the Atlantic. It is astonishing that Don should

find it in Glen Isla (an eastern glen) a full 70 years before its spread really got going. If his identification was defective it is still strange that he should mis-identify it as a plant that did eventually make its debut.

Scorched Alpine-sedge (*Carex atrofusca*) re-found in 1885 on Ben Lawers and now known elsewhere.

Purple Coltsfoot (*Homogyne alpina*) rediscovered in 1951 in Angus which was the county where Don found it.

A form of Bearded Couch (*Elymus caninus* ssp. *donianus*) rediscovered in Perthshire (the county where Don found it) in 1951 and since then also in Sutherland. This was originally treated as a separate species but has recently been regarded as a sub-species.

Many of these six resemble other species fairly closely, and Don has to be congratulated on his acuity in noticing small differences and bringing them to the attention of botanists. Much advance in botanical science has been made since Don's time by learning the power of this approach. Several of the six also grew in awkward or rather inaccessible corners, and he evidently had the knack of peering in just such places.

But what of the other eighteen species consigned to "limbo"? At least thirteen of them were of horticultural interest, and it seems very likely that some mix-up took place between what he brought home and what his nursery grew. This appears to be particularly the case when he brought home immature plants which had to be "grown on", as with the Alpine Buttercup (*Ranunculus alpestris*) which he brought from Wirran Hill. The visit was in April. There exists a contemporary account of the Dovehillock nursery written by a friend, Patrick Neill, who applauded the large range of plants being raised, but reading between the lines he disclosed a certain untidiness.

The thirteen species of horticultural interest are:

<i>Ranunculus alpestris</i>	<i>Potentilla opaca</i>
<i>Silene alpestris</i>	<i>Sanguisorba media</i>
<i>Saxifraga muscoides</i>	<i>Chaerophyllum aromaticum</i>
<i>Saxifraga pedatifida</i>	<i>Galium cinereum</i>
<i>Arenaria fastigiata</i>	<i>Centaurea intybacea</i>
<i>Hypericum barbatum</i>	<i>Crepis pulchra</i>
<i>Potentilla tridentata</i>	

The remaining five species fall into a different category as one is a Hawkweed (*Hieracium cerinthoides*) which name is now used for the series Cerinthoidea of the micro-species of *Hieracium*. The remaining four are members of the grass or sedge families and J.D. Hooker's names are *Eriophorum capitatum* Host., *Carex hordeiformis* Wahlenberg, *Phleum michelii* Allioni and *Triticum cristatum* Schreber.

Carex hordeiformis has experienced name changes and now is

C. hordeistichos. It is interesting that T. Drummond who eventually acquired Don's Dovehillock nursery produced a specimen (presumably from that nursery) of the same species of *Carex* in 1830 (sixteen years after Don's death).

Perhaps then, on all counts except for the tidiness of his nursery, we must accord to George Don the title of plant hunter, discoverer and recorder of the highest rank.



III.

George Don (1764-1814).

Courtesy R.B.G. Edinburgh

Plant Portraits

Arum idaeum

Nicholas Turland

Arum idaeum (Fig. 15, p54) is endemic to the South Aegean island of Crete, where it is found in all the major mountain massifs above an altitude of about 1400m. It grows in patches of deep, loamy soil overlying limestone and produces its leaves, which are typical of the genus, in the early spring. In late April or May, these are joined by the inflorescence, which consists of an erect, greenish-white spathe rolled up around the spadix to form a tube with a pointed apex. This opens to one side to reveal the beautifully contrasting, dark purple appendix (the term used for the visible part of the spadix). The inflorescence is followed by a head of berries, which are carried on a stout, upright stalk and become bright orange-red when ripe.

In its native home, *Arum idaeum* experiences a hot, dry summer, when the earth in which it grows becomes desiccated. It survives this period in a dormant state, being re-awakened by the onset of the autumn rains, which can be very heavy on Crete when they first begin. Roots sprout from the 'neck' of the tuber when the surrounding soil is moistened and the shoot starts to grow upwards. All of the areas in which I have seen *Arum idaeum* growing are subject to snowfall during the winter. This can lie for weeks or even months, during which time the shoot remains below ground-level (the tubers can be 20cm deep). When spring arrives and the snow quickly melts away, the leaves, and subsequently the inflorescence, are able to develop. After flowering and fruiting have been completed, the plant becomes dormant once again, oblivious to the unfavourable conditions which will prevail until autumn.

In cultivation, *Arum idaeum* appears to present no problems. It should be grown in a nutrient-rich, well-drained calcareous loam, with the tuber planted 10-20cm below the soil surface. In areas where hard frost penetrates far into the soil, a deeper planting is perhaps advisable. Having said this, however, the species seems to be perfectly hardy, at least in the southern half of England. I have not yet seen the plant grown in Scotland, but know of a healthy specimen which has lived for a number of years just outside the alpine house at the Royal Botanic Gardens, Kew. Here it flowers and fruits with no apparent damage from frost. I have Turkish material of *A. dioscoridis* in my own garden, which has had leaves frozen

solid on many occasions in the past, only to recover completely when temperatures rose above zero. I can think of no reason why this species should be more hardy than *A. idaeum*.

My own attempts at growing the plant have been limited. I sowed wild-collected seed in late autumn 1988 but, to date, no seedlings have appeared. Apparently, I was a little too late in the year with my sowing which should, ideally, have been carried out by the end of August. Seed from the same collection was successfully germinated by another grower so there was evidently no lack of viability.

Until quite recently, *Arum idaeum* was considered synonymous with *A. creticum*, which is also found on Crete. (This is the case in Flora Europaea). How this classification could have remained undisputed for so long is very surprising, since *A. creticum* has a larger, bright yellow spathe, which is recurved to almost completely expose the equally bright yellow appendix. The other main difference lies in the altitudinal ranges of the two species: *A. creticum* is found from as little as 100m right up to 1500m or more, while *A. idaeum*, as mentioned earlier, occurs from about 1400m upwards. At the site where the photograph was taken, on the southern side of the Psiloritis massif in central Crete, the two species were growing and flowering together on 14th April, 1989.

Material might be obtainable from specialist nurseries, although I have yet to see it offered. It is worth scanning lists in search of a 'pale' or 'white' form of *A. creticum* or asking nurseries if they have a plant which fits the description. It is certainly a species which deserves to be more widely grown.

Trachelium asperuloides

Lyn Bezzant

Trachelium asperuloides (*Diosphaera asperuloides*), Award of Merit 1938, (Fig. 16, p55) is a member of the family Campanulaceae. It is endemic to Greece and is found growing in shady rock crevices in the gorge of the River Styx. The plant forms a soft, dense symmetrical cushion of very small, glossy, light green sessile leaves. Terminal clusters of up to five deeply lobed light blue flowers appear in July. The specimen illustrated measures about 10cm in diameter and is 5cm high. I have grown it in a clay pot plunged in sharp sand in an unheated alpine house, shaded during summer from bright sun. The compost consists of 1 part lime chippings, ½ part loam and ½ part peat. The pot is top dressed with about 1cm of lime chippings to help keep the lower leaves dry.

After flowering the plant gets a light clip over and all loose ends are gently brushed out with a soft paint brush. Repotting is best done in spring as new growth starts, and at least every other year. *Trachelium asperuloides*

appreciates a normal supply of water during the growing season with an occasional weak liquid feed, and to be kept just moist during the winter. An overhead fine spray of water does not seem to do any harm in dry conditions, but on the whole I try to keep the foliage of this plant dry. Small soft cuttings will root in the alpine bench sand plunge if taken during the warmer months and kept moist and uncovered.

This plant is a seedling, the parent of which was bought from Broadwell Nursery. Seed is sometimes offered in the specialist exchanges.

***Androsace carnea laggeri* 'Andorra'**

Margaret & Henry Taylor

What makes a good alpine? Attractive, hardy, compact, easy to grow with no special fads and easy to propagate, that about fits the bill. The easy propagation is vital. Why bother with other temperamental plants when *A.c. laggeri* 'Andorra' (Fig 17, p.55) is such a paragon? Well that quadruple-barrelled name is a bit much to fit on a label (and to keep writing here).

Androsace carnea itself, as found in the central Alps can be a tiny plant 1cm across with washed-out, pale pink flowers. *Androsace carnea laggeri* of the eastern and central Pyrenees makes large attractive mats of dark green needle-like leaves covered with clusters of good pink flowers in spring. The crème de la crème *A.c. laggeri* 'Andorra' has deep rosy pink buds opening to large pink flowers with a darker pink ring around the yellow eye. Flower stalks 1cm tall gradually lengthen to 4cm with age and each bears on average six flowers. For sheer flower power 'Andorra' takes some beating. Looking at last year's diary, it started to flower in late March and was still in bloom at the end of April unscathed by three nights of -8°C . But you would expect a plant to be hardy when its origin is 2450m up a Pyrenean mountain.

It was introduced in 1975 – which says something for its durability – from an exceptionally dwarf large flowered plant. Cuttings root very easily in a clear plastic egg box half filled with vermiculite. There is no need to dip the cuttings in hormone.

It is a good trough plant and also easy to grow in a pot. Other cushion plants have a tendency to die with us before attaining any size but 'Andorra' has made a healthy 25cm bun in a clay pan. It is plunged outdoors in all weathers getting no protection and the pot is handy for taking it to flower shows. The compost is a gritty leaf mould mix. Now and again, when we remember, we give the pan a quarter turn to persuade the flowers to open simultaneously over the complete dome.

Snags? In a word, aphids. These brutes skulk inside the cushion gnashing away until a prize plant goes yellow and falls over at a touch. We regularly pour poison down the beasts' throats using an insecticide containing dimethoate – look for the small print on the bottle. Dimethoate is partially systemic which helps it to reach the enemy within.

Several nurserymen now stock *Androsace carnea laggeri* 'Andorra'.



Fig. 15 *Arum idaeum*, Psiloritis, Crete (p51)

Nicholas Turland



Fig 16 *Trachelium asperuloides* (p52)

Ron Bezzant

Fig 17 *Androsace carnea laggeri* 'Andorra' (p53)

M. & H. Taylor





Fig 18 *Cassiope stelleriana* (p58)

Ron Bezzant

Fig 19 *Daphne arbuscula* (p58)

Glassford Sprunt





Fig 20 *Tropaeolum azureum* (p60)

I. & M. Young

Cassiope stelleriana

Lyn Bezzant

Cassiope stelleriana (*Harrimanella stelleriana*), Award of Merit 1937, (Fig. 18 p.56) is a member of the family Ericaceae. In the wild it inhabits open rocky moorland along the Pacific coast of North America and northwards to the Aleutians, Alaska and Japan. It is a miniature prostrate shrublet which forms a 5cm high dense mat of interlacing branches clothed in dark green, finely leaved shoots. The flowers, which appear in April, hang from short slender stems and are pure white rounded bells with conspicuous red calyces.

The cool, moist conditions of the peat bed, and a position sheltered from drying winds suit this plant. It enjoys plenty of light and our west of Scotland wet climate. With me it has flourished for years in a sheltered trough devoted to small ericaceous plants, and has become inextricably intertwined with *Gaultheria thymifolia* and *Vaccinium oxycoccos*. I have also grown it in a large plastic pot plunged in a frame, covered in winter and shaded in hot summer weather. The lime free compost consists of 2 parts peat, 1 part each of loam and sharp sand. A top dressing of spent pleione compost and sieved peat or leaf mould is brushed into the foliage in spring. After flowering the plants are given a light clip over. *Cassiope stelleriana* must never be allowed to dry out. In hot weather an evening spray of lime free water is beneficial.

Small rooted fragments can be carefully detached from the edges of the plant and grown on in the above mentioned compost. Short soft cuttings taken in summer can be rooted in a mixture of half sand and half peat and kept close. The plant is occasionally available from specialist nurseries and has from time to time appeared very briefly on Club sales tables.

Daphne arbuscula

Glassford Sprunt

The name *Daphne* was originally applied to the bay tree, which had its name changed, and *Daphne* was subsequently transferred to its present genus. This genus has many species which are of interest to gardeners, and a number which are of particular interest to rock gardeners. The word *Daphne* is thought to be derived from a word meaning "odour", and *arbuscula* means "like a small tree".

Daphne arbuscula (Fig. 19, p.56) has been around in gardens for a considerable number of years, its existence having been recorded in 1855. It won an Award of Merit as long ago as 1915 and was awarded a First Class Certificate in 1973. Its natural habitat is in the Carpathian Mountains. Characteristically it is a semi-prostrate shrub with many branches. It is also evergreen, the leaves being dark green and often glossy and more or less linear. These leaves crowd the ends of the branches leaving the central parts of the branches bare. I get the impression that the leaf death, which occurs every winter, is of the two year old leaves. The dead leaves tend to hold on and

require tidying up in the early spring, especially if showing is contemplated. The shrub is slow growing and may put on only 12 - 18mm each year.

The flowers appear terminally on the branches and in clusters. The number of flowers to each cluster can vary considerably. The flowers appear in a strong flush usually in April and May, although there may be a few stragglers outside these times. The flowers are strongly fragrant, and are usually pink with a hint of purple.

It is surprising how relatively seldom *Daphne arbuscula* appears on the show bench. It may be that the biggest disincentive is the price and/or the difficulty of obtaining a plant. It does not seem to be a particularly difficult plant to grow as long as its wants are attended to. In its natural habitat it grows in the fissures of cliff faces in dolomitic limestone and also in conglomerate rock. This would suggest that it requires a constant source of moisture but also fierce drainage.

In the garden it is seldom possible to mimic satisfactorily the conditions found in nature, however it is possible to get reasonably close. I grow mine in clay pots which are in a moist sand plunge bed. Plunging means that the compost in the pots remains moist much longer than it would do in a free-standing clay pot and therefore the composts normally available in this country have to be modified.

I use a mixture of: 1 part of John Innes Compost No. 3, 1 part of coarse grit - up to 6mm, 1 part of grit-sand - up to 4mm and ½ part of sphagnum moss peat.

In view of the cries about the preservation of our peat bogs I will almost certainly change this in the future to an equivalent amount of leaf mould. This gives the necessary drainage with a certain ability to retain a small reservoir of water in the organic material. They do not seem to be too fussy about the pH. During the winter I keep the compost just moist, but make certain that they have an adequate water supply during the growing season. I also feed regularly with a weak solution of a tomato fertiliser.

Daphne arbuscula, in common with other Daphnes, enjoys good light and in their native habitat they grow in full sun. Herein may lie a potential hazard in growing them, in that it may well be that the sudden unexplained collapse that is seen in the genus may possibly be due to the shortage of water at a critical phase in its growth cycle.

I note that my original plant appears to be growing on its own roots and that my most recently acquired specimen is a grafted one. It will therefore be of interest to compare how each reacts over time.

I have never tried propagation of this species. Seed is, I understand, rarely ever set in this country and this may be due to those in this country originating from the same clone. Cuttings appear to give a ready means of

increase if taken from half-ripe wood in the period of June to August. My senior plant has now reached a size where this can be contemplated and I hope to do this this year. Propagation by layering and grafting are also appropriate means of increasing this species, although if cuttings succeed then grafting seems to be a little excessive.

Tropaeolum azureum

Ian & Margaret Young

Tropaeolum azureum (Fig. 20, p.57) is a herbaceous plant that scrambles through low scattered bushes on the hot rocky hillsides of its native central Chile. It is much like *Tropaeolum tricolorum* in leaf and stature but the flowers which arise from the leaf axils are, unlike any other *Tropaeolum* we know, a violet blue with a white centre and yellow throat. The flowers are more the shape of a violet than that we usually associate with the genus. The climate where it grows is comparable to the Mediterranean, with a short seasonally wet period during early growth and then very hot and dry; this gives us a clue to its cultivation.

Our experience with this plant started on the 16th of April 1988 when we received seed of the above, P & W 6055, from the Pern and Watson expedition to Chile and Argentina. The five seeds we received were sown immediately in a peat and sand compost and placed in a north frame open to all the elements. The seed started to germinate on the 9th of May 1988 and within a few days all five seeds had sprouted. We decided to prick out the seedlings after a further two weeks as growth was quite rapid. All plants were forming small tubers which were carefully potted on, four into 7cm square plastic pots and one into a 12cm clay pot, all in a similar peat and sand compost with some added base fertiliser. Each was given a juniper twig to twine up.

By early June three plants had grown slowly, the one in the 12cm clay pot had grown well and produced one tuber of about 2-3cms at the very bottom of the pot with a series of smaller ones up the stem. Perhaps by over-potting the plant is encouraged to produce more tubers instead of flowering; this may be a way of increasing stock. The fifth one was in full flower with 15 blooms, which with the help of a fine brush, produced a crop of seeds sown in June 1988 as soon as it was ripe. (Only one germinated in late March 1989 but on investigation, the other seeds remain healthy and we have high hopes that they may germinate in 1990).

The plants very quickly died down after this and we treated them all in slightly different ways to try to find a way to keep the tubers alive. We lost one plant that we kept dry and one that we planted in the garden has not been seen again!

The one that flowered was repotted into a 10cm clay pot and kept in a frame, plunged in sand which was always kept moist so the plant at no

time became arid and the last was kept in a similar situation in a frost free plunge in an alpine house.

In late March 1989 the plants that had been kept plunged in damp sand came back into growth, the one in the alpine house we let get too dry and the plant immediately went dormant again but the tuber is healthy. The one in the frost free plunge has a healthy tuber but no new growth, probably because it was too dry.

The plant in the frame, the one that had flowered the first year, grew healthily and flowered in the late April and May. We did not fertilise the flowers this time and no seed was set.

At the time of writing (mid-March) the surviving plants have been well watered for about three weeks and the plant that has flowered for the last two years is just coming through.

From their behaviour in pots, we assume the tubers grow at considerable depth in the wild, where, even in hot, dry weather, they would remain cool, with some moisture available. The method of cultivation we have decided upon is to plant the tubers at the bottom of a deep clay pot in an open compost (we use one part fibrous loam, one part peat and two parts grit). Keep dry, but not arid, from the time the plant dies down until late February/early March, then supply plenty of water and at no time during growth let the plant dry out or it will immediately go dormant. We understand that in Chile the rainfall does not always come, so this retreat into dormancy is the plant's method of survival. The plants prefer a shady spot as the delicate leaves, which in the wild would be shaded by the scrub, are easily burned in full sun. An occasional liquid feed would appear to be beneficial.

It is certainly a welcome addition to the range of alpine house plants and well worth every effort to satisfy its needs and ensure its continuation, and wider distribution, in cultivation.

Physoplexis comosa

Ronald McBeath

Since the earliest days of rock gardening, and regardless of the changes in plant fashion, a small number of alpine plants such as *Anchusa caespitosa*, *Campanula zoysii*, *Cypripedium calceolus*, and *Daphne petraea* have been the object of much admiration and have always been held in awe, with growers trying to obtain and successfully cultivate them. One other such plant is *Physoplexis comosa* (Fig. 21, p.74).

Reginald Farrer thought highly of this plant and devoted two pages to it in 'The English Rock Garden', although much of his text is about how hard it is to dislodge with a trowel from "the most microscopic of crannies of an apparently unbroken cliff face" or "neither hammer nor crow bar nor the rod of Moses will secure you perfect roots of more than one *Phyteuma* out of a hundred" – more than enough to make one wince with horror at

the thought of such destruction.

There is in fact no need or reason to dig up any plants, as seeds are available every year from seed lists and many nurseries now stock the plant. If the seeds are sown in a pot in a gritty seed compost in February and stood outside in a cold frame, germination should be good. As soon as seedlings are large enough to handle they are best potted singly in the longest small pot available, in a gritty potting compost. If you wish to grow the plant as a specimen pot plant, then check each year just as the growth is starting, to see if it is pot bound, and only then should it be repotted. In its natural habitat it is a crevice plant in limestone cliffs, not a meadow plant in rich brown soil and is much more likely to be killed by kindness rather than starvation. Protection in a cold frame or alpine house is recommended from late autumn through to the spring to keep out excess moisture, but for the rest of the year an open frame in full sun, exposed to all weathers is best.

In the open garden it can also be very successfully grown in a scree, raised bed, or in a trough as is the plant illustrated. In fact it can be very long lived and the plant in this trough in The Royal Botanic Gardens, Edinburgh is about 20 years old. The only treatment it receives each year is the protection of a pane of glass throughout the winter. Self sown seedlings are now established in a number of crevices in this trough, a sign of a contented plant.

In the wild it is found in Austria, Italy and Yugoslavia. For many years it was known as *Phyteuma comosum* but has now been placed in its own genus, *Physoplexis*. In the true phyteumas the individual flowers have no stalk and the corolla lobes are free after anthesis, in *Physoplexis* the individual flowers have a distinct stalk and the corolla lobes remain coherent at the apex. The flowers are held in a head of up to twenty flowers, each flower is tubular and inflated at the base, the flower colour is lilac-pink deepening to a dark purple at the tip. There is reputed to be a white form but it is very rare in the wild or in gardens.

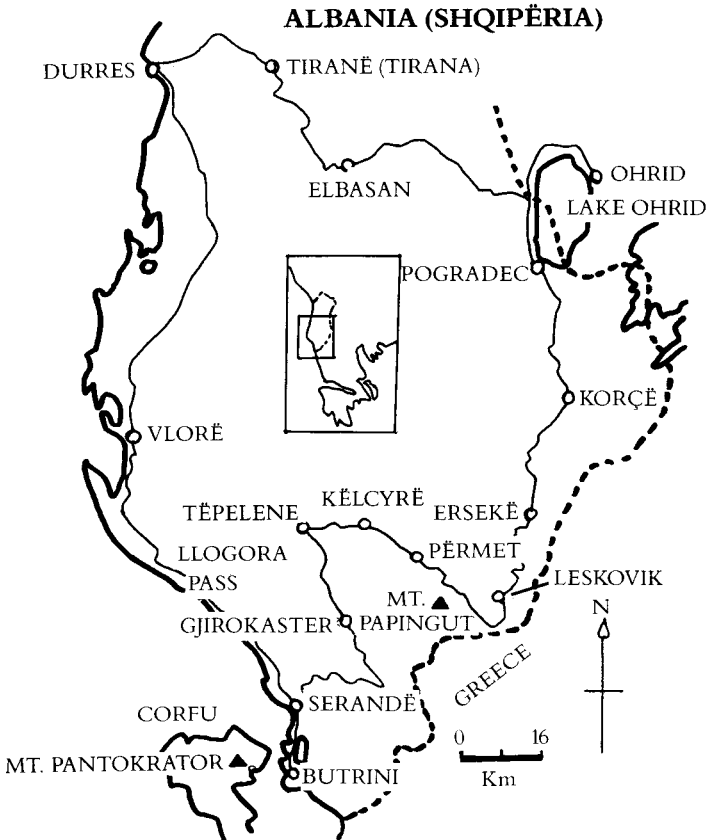
Physoplexis comosa was awarded an F.C.C. and a C.C. at the Newcastle Show in May 1990.

Eds.

Into Albania

CHRIS NORTH

Albania is a small country, about one third the area of Scotland, sandwiched between Yugoslavia and Greece. It borders the Adriatic Sea which, at the southern extremity, is only 4km from the Greek island of Corfu. The country has been successively overrun by various invaders but gained its present boundaries as an independent self-governing nation in 1912. Since 1948 Albania (Shqipëria) has been a hard-line communist state, inaccessible to western visitors. At last the country is being opened to tourism and when I saw an advertisement for a botanical tour I could not resist the opportunity.



Like other Balkan countries, Albania has substantial mountains, rising to 2,693m at Mt. Jezercë in the north near the Yugoslav border and with other peaks over 2,000m in the east and south. There are several outcrops of serpentine, which is associated with metals such as chromium and nickel, which are mined as an important export. Serpentine is interesting from a botanical point of view as it is toxic to many plants and thus harbours a special flora of species which have a degree of tolerance.

Winters can be quite severe in the central and eastern parts of the country, with snow lying on the hills well into summer, but the area near the Adriatic has a more typically Mediterranean climate. However, the rainfall is higher than in most parts of the region and the north of Albania is close to a part of Yugoslavia which has the highest precipitation in the Mediterranean – higher than that of the west of Scotland.

The most readily available publication on the flora of the region is the handbook on flowers of Greece and the Balkans by Polunin (1980). A more thorough treatment is the relatively new and substantial flora of Albania by Demiri (1981), available at a remarkably modest price in the country. It is written in Albanian but has 2484 line drawings of plants which are very helpful if one does not speak the language! Also very useful is an appraisal of the orchids of the region by Göltz and Reinhardt (1984) but this is in German and not readily available. One can obtain a tourist map in Albania itself and at least one can be bought in Britain – published by Baedekers, of Albania, Yugoslavia and northern Greece, but the spelling of place names sometimes differs from that in the authentic Albanian version.

Our party of eleven was led by Dr John Akeroyd from the Botany Department of Reading University, a former pupil of the late Oleg Polunin who did so much for wild plant enthusiasts through his books. John was a great help throughout the trip and we would have been at a loss to identify many of the plants without his professional touch.

We flew to the resort town of Ohrid in Yugoslavia on the 15th of May and travelled by road to the Albanian border on the following day. Having passed the Yugoslav customs check we walked through no-man's-land carrying our suitcases to the Albanian frontier. After a lengthy, good humoured examination we boarded the coach with our English speaking Albanian guides, who never attempted to restrict us in any way.

Our first stop for botanising was near the shores of Lake Ohrid on the Albanian side. In stony scrub by the roadside we saw *Convolvulus altheoides*, *Dictamnus albus*, *Helleborus cyclophyllus*, *Iris sintenesii* and *Linaria angustissima*. The convolvulus had particularly silvery leaves of a somewhat metallic sheen. The dictamnus is the showy 'burning bush' and we saw quite a few more specimens of this conspicuous plant. The iris is a rhizomatous species with grassy leaves and attractive purple flowers

resembling those of *I. graminea* but without flattened stems. The linaria has long, dense spikes of small yellow toadflax flowers. A short distance further on we saw bushes of box (*Buxus sempervirens*), the yellow-flowered scorpion senna (*Coronilla emerus*) and danewort (*Sambucus ebulus*).

Our hotel for the night was at Korçë, some 40km south of Lake Ohrid. After a short break to clean up we were taken to a hilly area by a winter ski run for plant hunting. Here, in the grass and under trees we saw:

<i>Acanthus spinosus</i>	<i>Convolvulus lineatus</i>
<i>Ajuga genevensis</i>	<i>Eryngium campestre</i>
<i>Anchusa undulata</i>	<i>Helleborus cyclophyllus</i>
<i>Arum italicum</i>	<i>Scrophularia peregrina</i>
<i>Campanula patula</i>	<i>Silene conica</i>

Amongst the plants we could not identify with certainty were species of euphorbia, lathyrus and onobrychis. The arum was especially interesting for it appeared to be *A.i. byzantinum*, with smaller spathes than the type, tinged with red around the margins. Unlike the usual form, the leaves tend to start shrivelling before the inflorescences have passed their prime. Demeri (1981) does not record *A.i. byzantinum* for Albania; Polunin (1980) says that it is found in the east Balkans and Crete. Amongst the trees and shrubs we noted the cornelian cherry *Cornus mas* covered with its tiny yellow flowers, much *Robinia pseudoacacia* and *Pyrus elaeagrifolia*. The last of these is a small, sometimes spiny, tree resembling the willow-leaved pear *Pyrus salicifolia* which is frequently seen in our gardens.

The following day we continued our journey southwards through the plain of Korçë which lies at about 800m above sea level. Climbing out of the plain there were pine woods with bracken and some *Juniperus communis*. There were also areas of typical Balkan woodland with small trees of various oaks, hop-hornbeam *Ostrya carpinifolia* and the shrubby oriental hornbeam *Carpinus orientalis*. They included the Valonia oak *Quercus macrolepis* (= *Q. aegilops*), a stocky tree distinguished by its leaves with pointed serrations and felted grey undersurface and its large acorn cups with long scales; at one place we saw it grown as a plantation – the acorn cups are used in tanning. The name ‘Valonia’ (sometimes spelt Valona) may refer to the Albanian coastal town of Vlorë, so we were near to its home area.

Soon we were in view of the snow-clad Grammos mountains which rise to 2,523m on the Greek border. They are one of the few areas of granite in the Balkans and have not been fully explored botanically. Stopping near the village of Ersekë we were delighted to find the attractive *Hypericum rumeliacum*, with its petals, sepals and leaf margins spotted with blackish dots. With it grew two species of astragalus – one of which was probably *A. spruneri* – and an interesting thyme which, judging from photographs,

could be *Thymus cherlerioides*.

Passing by rocky hillsides with box *Buxus sempervirens* and *Acer monspessulanum* one could see primroses *Primula vulgaris* with pale yellow or nearly white flowers, *Ajuga genevensis* and a hellebore. Stopping by a lake near the town of Leskovik we had a good view of the snow-capped Mt. Papingut (2,485m). Here grew the attractive yellow *Linum flavum*. There was a gladiolus, probably *G. illyricus* but the species are difficult to identify with any degree of certainty. Other plants included *Vicia dalmatica* (like a large-flowered *V. cracca*), *Convolvulus arvensis* and *Salvia viridis* which is often grown in our gardens as an annual when it is referred to as *Salvia horminum*.

We travelled past pine woods and one could identify various shrubs and trees, including:

Cercis siliquastrum

Cistus incanus

Erica arborea

Myrtus communis

Platanus orientalis

Rhus cotinus

Spartium junceum

I may have been mistaken but I think I saw groups of the orchids *Orchis italica* and *Gymnadenia conopsea* whilst passing in the coach.

Turning north-west the road took us along the valley of the River Viose which flows down from the Pindos (or Pindhos) mountains in Greece and through the town of Përmet. The plain beyond it grew many crops including cereals, tobacco and figs. At Këlcyrë we turned westwards through the Gryka pass. At the entrance there were large groups of the shrubby Christ's thorn *Paliurus spina-christi*. It has spiny, flattened, horizontal branches covered with tiny yellow flowers that are followed in late summer by strange-shaped fruits that look like miniature cardinal's hats. There were also many bushes of *Phlomis fruticosa*, *Punica granatum* and *Spartium junceum*, all of which reminded us that we were nearing an area of more typical Mediterranean vegetation. At the end of the pass we turned southwards to Gjirokaster past the town of Tëpelene, which Lord Byron visited in 1809 when it was a stronghold of Ali Pasha.

Gjirokaster (its name is a corruption of the Latin, meaning around the castle) is an interesting town with old stone buildings of a special local style, which have influences of both Turkish and Greek architecture. A typical example of these is the 'birthplace' of Enver Hoxa, designer of the People's Socialist Republic of Albania. Whilst visiting there we noted that, between stones just outside the house, grew one of the only truly Albanian, or rather Epirotic endemic plants we saw – *Capsella grandiflora*. It closely resembles the common shepherd's purse *C. bursa-pastoris* but, as its name suggests, the flowers are larger, about the size and general appearance of the 'white alyssum' of our gardens and they have a similar honey-like scent.

The castle is impressive but is used as a rather sinister museum of cannon

and other war equipment. However, there were several interesting plants around it, including:

Capsella grandiflora
Clematis flammula
Clematis vitalba
Digitalis lanata
Dorycnium hirsutum
Erysimum sylvestre

Leopoldia comosa
Lysimachia atropurpurea
Trifolium ochroleucon
Umbilicus horizontalis
Vicia lutea

The digitalis is a foxglove with a dense head of rather small, pinkish-grey or yellowish-white flowers. It is a perennial and not difficult to grow in the garden. The erysimum is a delightful small wallflower-like plant with light yellow flowers. The recently published OPTIMA Mediterranean-Checklist classes it as having been reported from Albania in error but it does occur at Gjirokaster. The lysimachia is unlike others of the genus with spikes of small, dark red flowers which seem to remain unopened, and very wavy leaves. It is widespread throughout the Mediterranean but often overlooked.

Our journey the following day was to be relatively short, so we spent some time looking for plants on a hill above Gjirokaster before departing. In a rocky and grassy area grew a number of plants we had not previously encountered:

Alcea pallida
Anchusa cretica
Arum italicum
Asphodeline liburnica
Bunias erucago
Campanula drabifolia
Crepis rubra

Echium plantagineum
Euphorbia characias
Micromeria graeca
Rumex pulcher
Silene cretica
Stachys germanica
Tordylium apulum

The arum was the usual form with green spathes and 'marbled' leaves, not the variety *byzantinum* that we had seen earlier. It is not certain that the campanula was, in fact, *C. drabifolia* though it looked like it superficially; neither Polunin (1980) nor Demiri (1981) record it in Albania. *Crepis rubra* is an annual or biennial with capitulae of pink flowers rather like the perennial Grecian dandelion *C. incana* but larger. It is a species mainly of the north-eastern Mediterranean region but common in parts of Italy. There were quite a few butterflies here including the southern white admiral.

Continuing along our planned route to Sarandë, in the province of Dropull we passed some villages of Greek speaking Albanian citizens. Soon we turned westwards over the Muzine pass. Here we saw much *Phlomis fruticosa* and when we stopped the ground seemed in places to have a complete cover of *Salvia officinalis* – the wild form of our garden sage. At the highest part of the pass there was much bracken and we saw a pair of Egyptian vultures soaring. Stopping lower down, there were several

interesting plants including a species I believe to be *Verbascum creticum* or *Verbascum arcturus* – whichever is the up-to-date name. It grows to about half a metre, but is usually shorter, and has fairly well-spaced apricot-coloured flowers with violet hairs on the stamens. It is common in parts of Corfu as well as Crete and is said to grow in Sicily and Sardinia. Another interesting plant here was the uncommon *Moenchia mantica*, a member of the Caryophyllaceae and somewhat like a greater stitchwort with bowl-shaped white flowers.

Approaching the Mediterranean seaside resort of Sarandë there was a very fine salvia growing by the roadside, probably a form of *Salvia virgata* with large, almost lilac-coloured flowers. With it grew the goat's rue *Galega officinalis*, a fairly common plant of our herbaceous borders at home.

Having been settled in our hotel we went on a tour south to Butrini the following day. Our objective was the classical site of Buthrotum which has Illyrian, Greek, Roman and Byzantine remains. The ruins are rather extensive. It is in a pleasant wooded site near a large brackish lake which has a narrow passage to the Ionian sea and is dominated by a fortress built by Ali Pasha. On the site there were many plants we had seen earlier and also the following:

<i>Allium subhirsutum</i>	<i>Pallenis spinosa</i>
<i>Anacamptis pyramidalis</i>	<i>Prunella laciniata</i>
<i>Anagyris foetida</i>	<i>Ruscus aculeatus</i>
<i>Berteroa obliqua</i>	<i>Scutellaria altissima</i>
<i>Blackstonia perfoliata</i>	<i>Securigera securidaca</i>
<i>Centranthus longiflorus</i>	<i>Trigonella foenum-graecum</i>
<i>Fumaria capreolata</i>	<i>Vicia lutea</i>
<i>Gynandrisis sisyrinchium</i>	<i>Vicia melanops</i>

The scutellaria is a rather tall skull-cap growing to about 50cm high or more and a somewhat uncommon species found in deciduous woods of south-east Europe. The name 'skull-cap' refers to the curious shape of the calyx. *Securigera* has been included in *Coronilla* and closely resembles that genus. The pods stand in a group like the spokes of an inside out umbrella and their ends are curved like a shepherd's crook. *Trigonella foenum-graecum*, a small legume with trifoliolate leaves and yellow flowers, is fenugreek, the main constituent of Indian curry. Its presence can be identified at a distance in warm air on account of the familiar aroma. In a cool shady place with the tiny *Selaginella denticulata* and the fern *Anogramma leptophylla*, I saw one plant of the uncommon, and rather insignificant orchid *Epipactis microphylla*. It is recorded from Albania by Göltz and Reinhard (1984), but not as far south as this.

We were taken to a wooded area beside a trout stream to have lunch. Plant hunting revealed *Symphytum ottomanum* with small white flowers

and, like many other symphytums I have seen, it was badly eaten by insects. In a dry sunny area we found an orchid which seemed to be *Serapias vomeracea* ssp. *orientalis*. Some of the specimens had rather broad lips and superficially looked like *S. cordigera* but the ridges at the base of the lip were parallel and not divergent as in the latter species. However, Göltz and Reinhard (1984) do not record this sub-species in Albania and probably class it as *Serapias vomeracea* ssp. *vomeracea*.

The following day we set out for Tiranë (Tirana) travelling northwards. At first the road runs parallel to the coast on high ground with fine views seawards. We stopped by stony garrigue where we saw *Micromeria juliana*, *Silene behen*, *Stachys ocymastrum* and *Malcomia maritima*, along with *Haplophyllum coronatum*, a rue-like plant with flat heads of yellow flowers, and *Linaria genistifolia*, an attractive species with relatively large flowers. It is a somewhat variable species; ours was rather short-growing with an unbranched stem.

On rocks by the roadside we saw *Euphorbia dendroides* which grows to 2m tall as an attractive rounded shrub. The road rose to 1,025m at the Llogara Pass and here there was a distinct alpine feeling. In the short grass among rocks, and between fine groups of *Pinus leucodermis*, grew:

<i>Anthemis tenuiloba</i>	<i>Parentucellia viscosa</i>
<i>Cerastium alpinum</i>	<i>Silene italica</i>
<i>Hermodactylis tuberosus</i>	<i>Tordylium apulum</i>
<i>Onosma</i> sp.	<i>Viola speciosa</i>

The anthemis is a variable species usually found in mountains. This form was an especially attractive one with broad white ray florets – some forms have no ray florets at all. The viola (Fig. 22, p.74) is a mountain pansy with a fairly long spur and finely divided stipules. It occurred in yellow, mauve and bicolour forms. Flora Europaea says that it is found in the Crna Góra Mountains of Yugoslavia and in north Albania. We had found it in the south. It is surprisingly like *V. aethnensis* that grows on Mount Etna and the Gargano peninsula of Italy which we had visited some six weeks earlier. The Gargano juts out towards Albania and there are theories that it was joined to this area at one time cutting off the shallow northern Adriatic Sea as a lake.

Along with the above were groups of *Orchis quadripunctata*, *O. pauciflora*, *Ophrys ferrum-equinum* and *O. lutea*. However the most exciting find of the whole tour was the discovery by one of the party of a single specimen of *Orchis albanica*. This has only recently been described by Göltz and Reinhard (1984) and somewhat resembles *O. morio* but is generally taller, fewer flowered and has the side petals spreading rather than formed into a distinct 'hood'. It only just misses being an Albanian endemic for it has been recorded from one site in Yugoslavian Macedonia.

Coming down from the pass we stopped to look at some purple orchids, thinking that they might be more *O. albanica* but they turned out to be *O. laxiflora* and were growing alongside *Aristolochia rotunda*. We then drove northwards through flat cultivated land to arrive at the capital city Tiranë. The following day we set off eastwards and lunched at Elbasan, a steel producing town with chimneys belching forth alarming quantities of thick brown fumes. A short, final, botanising stop revealed blue gromwell *Lithospermum purpurocaeruleum* (*Buglossoides purpurocaerulea*) which grows in some of the southern counties of England, *Teucrium chamaedrys* and *Salvia ringens*. The last of these is a magnificent species growing to a metre high, with large dark blue flowers with a white mark on the front. It is said to be hardy in Britain.

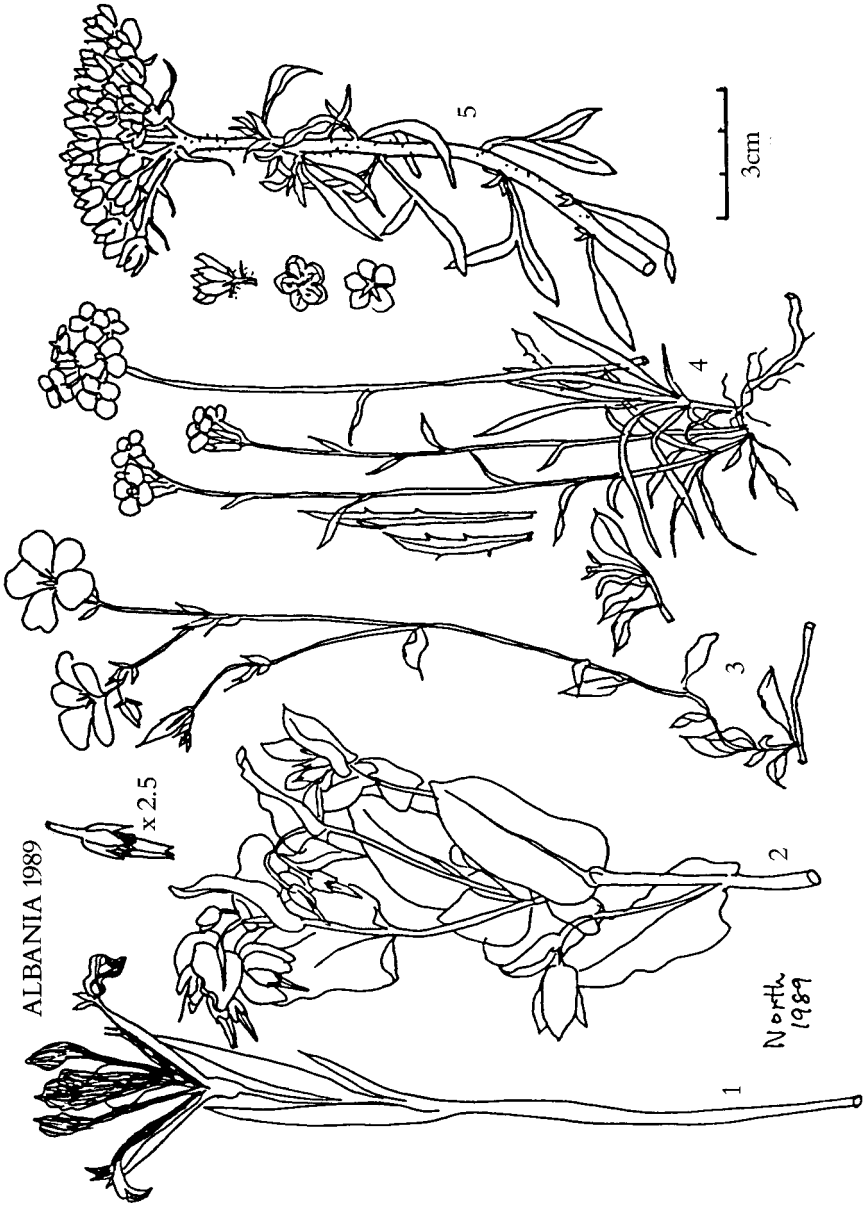
Albania and the Albanians were somewhat different to what I had expected. Looking at the country from Mount Pantokrator on Corfu, one half expected to find a wild country populated by goatherds, perhaps with a touch of centaur blood. In fact the Albanians are quiet spoken and polite. We were kindly treated and not at all harassed and the food was good. The plants we saw were what one might expect in the Balkans, with few endemics, for the country is small and we only saw parts of the southern half. I would gladly go back for more extensive botanising.

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Flowers of Albania (p.71)

1. *Iris sintenesii*
2. *Cerinth minor*
3. *Linum flavum*
4. *Erysimum sylvestre*
5. *Haplophyllum coronatum*



ALBANIA 1989

North
1989

x 2.5

3cm

The Lady of the Snows and her Cousins

SANDY LEVEN

There are few plants suitable for the rock garden which are more magnificent and eye catching than the pulsatillas. They are wonderfully architectural plants which provide a bold splash of colour in spring and early summer. Planted correctly, with the sun backlighting the feathery seed heads, they give added interest in summer.

Most alpine flower calendars contain a picture of a pulsatilla. One I bought in the Voralberg last summer had a splendid illustration of *Pulsatilla vulgaris* for January. The sight of the purple goblets in a low meadow contrasted markedly with the sleet on my window and the wind howling in from Ben Lomond. Also, prominent amongst the postcards in almost every alpine gift shop and restaurant you will find at least one of a pulsatilla. They are obviously great favourites with the public, along with gentians, trollius and edelweiss.

Pulsatillas look too tall and refined to tolerate the conditions in their mountain homes, and the often harsh spring weather at flowering time. Many of them rush to flower as soon as the snows recede, rapidly following the soldanellas into bloom. They are in seed before many of their neighbours are in flower. They are undoubtedly "showy plants" but they possess a beauty, grace and elegance surpassed by no others. They dominate their homes, having the largest, most splendid flowers; their pubescent leaves and stems are magnificent in the sunlight and their feathery seed heads demand to be touched. At all stages of growth they are superlative plants to photograph, especially when they are lit from behind.

Pulsatillas are members of the Ranunculaceae, cousins of buttercups, aquilegias, hellebores and anemones. At one time they were classified as anemones, and many modern American flower guides still refer to 'Anemone patens' and 'Anemone occidentalis'. They do not have true petals. Instead the sepals look like petals and are correctly known as tepals. Their common name is Pasque flower although I have never heard anyone say 'Aren't the Pasque flowers great this year'. All my friends who refer to them at all, call them 'pulsatillas', and I would suggest that pulsatilla is as common a name as 'buttercup', 'rose' or 'dahlia.' The name 'pasque flower' indicates that pulsatillas are in flower at Easter, and *Pulsatilla vulgaris* was used in olden times to dye Easter eggs green.

The genus is widespread throughout the northern hemisphere, in Europe, Asia and North America. They are mainly plants of subalpine meadows. Many have large open flowers while others have more tubular nodding small flowers. The seed exchanges of our club, the AGS and ARGS list many different species and cultivars. Seed is best sown fresh when germination can be quite rapid. Dry older seed from the seed distributions can be erratic in its germination. I sow the seeds in a mixture of John Innes, perlite and grit, cover them with a fine layer of compost to hold them in place, then top dress the pot with grit. When large enough to handle the seedlings are potted individually into quite deep pots and then repotted as needed.

***Pulsatilla vernalis* The Lady of the Snows**

This is one of the most beautiful of the slightly taller growing alpine plants. In flower it is about 20-25cm tall, the flower stems rising clear of the foliage, which if the plant is isolated from its neighbours tends to form a broad dome up to 12cm high. In a trough the plant can be altogether more compact, even though it does not look starved. To flower well, it needs to be well fed but have its roots somewhat restricted. Last spring I had growing, in a hypertufa trough, a three year old plant, barely 12cm across, with ten flower stems. Perhaps it enjoyed the trip to the Glasgow Garden Festival as a foliage plant, in one of the troughs which comprised the Stirling Group's gold medal exhibit. My two largest and oldest plants are grown all year round in an alpine house. They are in 20cm pots. My first plant of *P. vernalis* was a seedling given to me by Mr Jack Crosland. I received it when I was quite new to growing and especially to showing alpines. The only things I had shown, until three years before, were cocker spaniels and Irish setters. The other plant was a seedling of a form originally from the south side of the St Bernard's Pass. The foliage of the two forms, while basically a three lobed leaf, cut three times, is of different colours. One plant always has darker, more shiny leaves than the other, which has a bronzy hue. The plants in the pots are grown in a rich well drained material. They are fed about once a month with liquid fertiliser. Pulsatillas build up their flower buds towards the end of the year. Outside they are more or less herbaceous in that the old leaves die away. In pots or troughs the older leaves die and the young leaves over-winter. By December the plump, pubescent, shiny flower buds are sitting at soil level like little pointed acorns, waiting for Easter. At this time it is important not to allow the foliage of the plants to become too wet or even persistently moist. I had become blasé about the plant and thought I had mastered its cultivation, but one February evening at twilight, when I went to check the plant which Jack gave me, and which gained a Certificate of Merit at the Edinburgh Show, I noticed that most of the buds had blackened and begun



Fig 21 *Physoplexis comosa* (p61)

R.B.G. Edinburgh

Fig 22 *Viola speciosa*, Llogara Pass, Albania (p69)

Chris North





Fig 23 *Pulsatilla vernalis*, Pordoi Pass, Italy (p78)

C. & I. Bainbridge

Fig 24 *Pulsatilla patens flavesces* (pp82,92)

Polly Stone

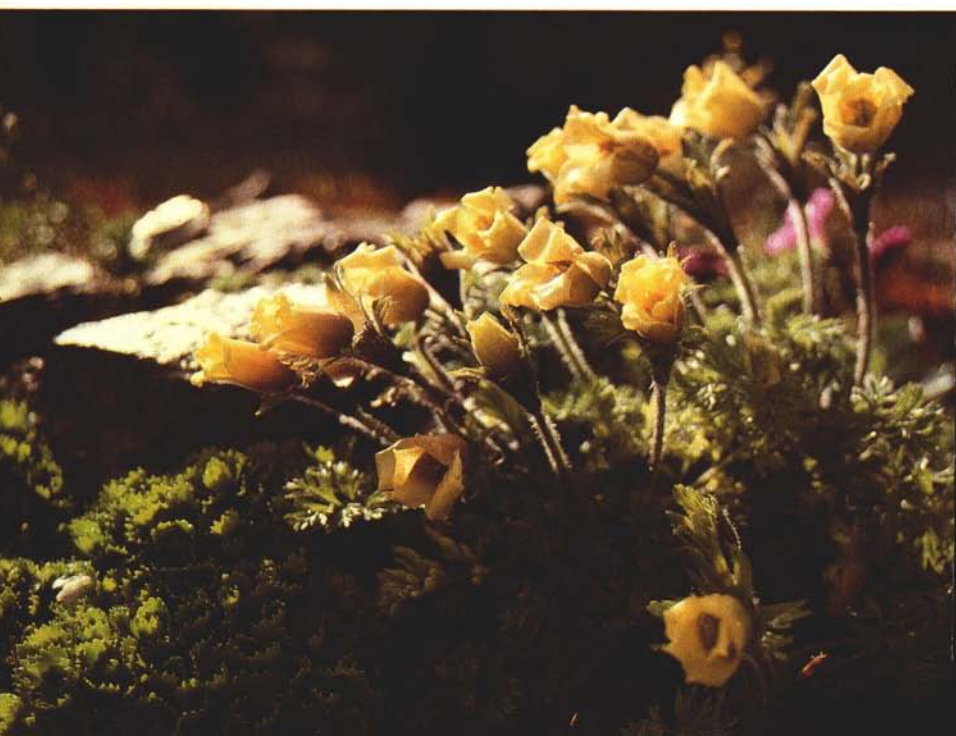




Fig 25 *Pulsatilla alpina* (p79)

Sandy Leven

Fig 26 *Pulsatilla alpina apiifolia* (p80)

Sandy Leven





Fig 27 *Pulsatilla aurea* (pp82,92)

Polly Stone

to rot. I had to pull these off as the rot had spread down the under-soil stems. Luckily the plant recovered in spring, with a luxuriant growth of new leaves, even more fortunately the other plant was unaffected and was taken to Edinburgh Show for me by Evelyn Stevens, where it gained a Forrest Medal. Why did one plant succumb to a black rot and the other in an adjacent pot flourish? When I saw the black flower buds, they were dry and crisp to touch, and I think they suffered from stemrot and died from below. This may have been, in part, caused by repotting the plant too late in the year and allowing it to sit with stagnant soil around its root ball. I don't think one plant could have been given so much more water than the other but the large pot would hold the water longer. Happily the plant grew away strongly and looks none the worse. Perhaps it will be stronger next year.

In March the flower stems lengthen and the buds swell. The buds can be covered in blue, white or golden hairs. *Pulsatilla vernalis*, like other pulsatillas, gives double value in magnificent flowers and wonderful seed heads. The flowers are cream cups with a splendid central boss of golden stamens backed with varying amounts of greyish blue, which fades to a pinkish hue. I have been told that near Nuria in the eastern Pyrenees, *Pulsatilla vernalis* has flowers which are pink on the backs of the tepals. A plant exhibited at the 1989 Morecambe show was certainly pink on the outside of the tepals, and this is a variation which I am looking forward to in my seedlings. The flowers may look straight up or be at right angles to the stem; the former is the more attractive. The seed heads develop tantalisingly from the faded flowers. At first, wisps of thin silvery feathers peep above the dried out tepals, and as the tepals shrivel and the seeds mature, the plant becomes a dome topped with a cloud of bearded seedheads. When light shines through the wispy feathers the tiny hairs light up and seem to be iridescent. Unfortunately *Pulsatilla vernalis* does not quite match *P. alpina* or *P. halleri slavica* with their magnificent hair-clad stems and flower buds, but its seed heads are equal to both of these. The seed is ripe when it can be removed with a gentle tug. Fresh seeds germinate well if sown as soon as ripe; it will self-sow in the alpine house in the soil plunge or in the grit surrounding *Primula allionii* or *Draba mollissima*! More practically, sow the seed fresh into a mixture of J.I. No 1, grit and Perlite and cover the seed with a layer of grit. Wait till the seedlings become plantlets with at least two true leaves and transplant them into a fairly rich, well drained mix. If planting outside or into a trough, wait until the plants are a reasonable size. Pot grown plants transplant well at any time of year except when the weather is extremely cold or excessively hot or dry.

I have seen *P. vernalis* in the wild on the St Bernard Pass, the Col d'Iseran and the Pordoi Pass in the Dolomites (Fig. 23, p.75). Its foliage is quite

distinctive and easy to recognise. It also grows in the Pyrenees and Scandinavia as well as being widespread in the German, French and Swiss Alps. It grows in alpine meadows at altitudes of between 1500 and 3000 metres.

Unusual colour forms of *P. vernalis* have been reported growing on Obenberg near the Brenner Pass in southern Austria. These forms were “in every shade, from claret to pink and rose, with one perfect white and backed with French grey to act as foil. Some were in flower, some in bud, all had a thick coat of softest fur”. (A.G.S. Bulletin 1955, V.23, p81). Also in the A.G.S. Bulletin (1950, V.18, p124) double and coloured forms of *P. vernalis* were reported in the Engadine. In the mountains surrounding St Moritz are variants on the usual white form, “rarely one is a tender rose; some with wine red sepals with purple red markings towards their tips”, an exceptional rarity is a double flowered form. In the double flower the central boss of stamens was still visible.

Pulsatilla alpina

The visitor to the European Alps in summer is very likely to come across 60cm high plants of *Pulsatilla alpina* in seed. It often covers huge areas of damp mountainside and seems to be unpalatable to sheep; certainly they prefer grass. In July some diligent searching for a hollow which contains a late snow pocket will reveal some plants in flower. Several years ago, before my children went to school, we visited the legendary Mont Cenis area in early June. There were still patches of snow. Other areas which looked like snow were large clumps of *P. alpina*, just coming into flower (Fig. 25, p.76). They started flowering at 15-25cm. The flowers are among the largest of the pulsatillas, easily 12cm across and pure pristine white. We sat on rocks amongst the clumps because the ground was quite wet with the melting snow water, eating our picnic above Mont Cenis, gazing over clumps of white *P. alpina* towards the greenish blue mountain lake under a cloudless sky; quite unforgettable.

Several years later all the clumps on that same west facing slope were in seed by mid July. We had to search hard for flowers; only on a north facing slope, on the road to the Petit Mont Cenis, which the sun hardly touched, did we find *Pulsatilla alpina*. Here, however, they grew singly or in very small clumps. Large clump or small, it is still a spectacular plant. The reverse of the glistening white tepals is flushed with varying amounts of blue. The whole plant is covered in shimmering white hairs. The blue on the tepal reverse is most obvious when the buds are still closed. The seed heads are again large. They seem to shine, as if some mountain sprite had painted the green feathers with silver.

P. alpina is generally found on limestone areas. Its close cousin *P. alpina apiifolia* favours acid rocks. Rarely, as on the Petit Mont Cenis, the two may be found together.

I once convinced myself that I had found hybrids between *P. alpina* and *P. vernalis* but now I am not so sure. The plants seemed to have different leaves and were intermediate in height.

P. alpina apiifolia is very similar to *P. alpina* except in flower colour (Fig. 26, p.76). The flowers are a good sulphur yellow, sometimes paler, sometimes darker. Its former name *P. a. sulphurea* was an accurate description. I have never found large clumps of *P. a. apiifolia*; perhaps I have not been in the right areas. In my experience, it is a rarer plant and where it occurs, the individual clumps are smaller.

Last year on the Bindelweg above the Pordoi Pass in the Dolomites we found some exceptionally beautiful plants with 10cm cups of pale yellow backed by rich blue! A truly wonderful colour combination. Perhaps seed grown plants will throw up this variation. Not far away on the Passo di Monte Giovo (Jaufen Pass) single cups of purest sulphur with no trace of blue stood like golden communion cups amongst quite long grass.

***Pulsatilla vulgaris* The Pasque Flower**

P. vulgaris is the most commonly grown pulsatilla. There are many colour forms, and some should be in every garden because they have a long useful season. Well manured soil results in large plants, while poorer soil results in smaller but more compact plants. Those in poor soil do not necessarily look starved. In the garden the leaves and buds appear in late March or early April. The stalks slowly lengthen and when they are about 10cm the buds turn outwards and begin to open. In fruit the stems are 30cm high. In many gardens *P. vulgaris* seeds itself around. All are spectacularly beautiful in bud; they have large silky flowers and the usual feathery seed heads. Not as tall as *P. alpina*, it is more suitable as a garden plant. Once planted it is unwise to disturb it, although clumps of good forms can be split up. I think this leads to loss of vigour, and it certainly sets flowering back a couple of years.

The wild form is either a rare British native or a Roman introduction. It is found in East Anglia, the English chalk hills, Normandy and Brittany as well as more widely in Europe. It often grows near Roman roads, is a compact growing plant with violet flowers but when planted in the garden it becomes coarser and resembles the form more commonly grown.

There are several named varieties of *P. vulgaris*, the most sought after being 'Budapest'. This has large lavender flowers covered with golden down. At the 1990 Morecambe show there was a terrific seedling of 'Budapest'. It was notable for its large outward facing flowers in soft lavender with a central boss of yellow stamens surrounding a bright purple style. 'Mrs Van der Elst' is a sought-after pink form, and the *P. rubra* of commerce is often *P. vulgaris rubra*. Good white forms exist. They often have nice fresh green foliage. In the garden, these should all be given full

sun and a rich well-drained position. In a pot they resent root restriction, and a deep pot or a long tom suit them best.

Pulsatilla halleri slavica

The first time I saw *P. halleri slavica* was at one of the early spring SRGC shows. The plant shown was Mr Harold Esslemont's magnificent plant which he had grown from seed sent by Dr Kazbal. Mr Esslemont has been very generous with the seed from his plants and several growers now have offspring of his plant coming to maturity. Mine flowered in 1989 for the first time. In Central Scotland it flowers in late March, before *P. vernalis*.

In cultivation in a deep pot its flower buds start to open on 15cm stalks which slowly lengthen, and in full flower is about 40cm tall. In seed, it is taller. The flowers are rich violet, with cups similar in form to *P. vulgaris* but the colour is much stronger, almost luminescent. Its outstanding feature is the magnificent dense white hair which covers the stems, leaves and the outside of the sepals. So dense can the hair be on the opening leaves that they appear to be silvery white.

Two American Pulsatillas

Pulsatilla patens

While staying in Sherridan, Wyoming we took a trip into the Bighorn Mountains. This limestone range rises steeply from the hot western plains, and one quickly comes to rich, flower filled meadows whose dominant plants are lupins and the large yellow daisy *Hymenoxis grandiflora*. Amongst these are magenta *Geranium viscosissimum*, pale yellow *Castilleja sulphurea*, and the seed heads of *Geum triflorum* and *Pulsatilla patens*. Higher up, on large blocks of limestone talus rocks, are large mats of *Petrophytum caespitosum* just coming into flower. The buds, like little brown and green marbles, pushing up through the tiny light shrubby branches, quickly elongate into stalked lamb's tails about 4-5cm tall. Also here at Steamboat Point is *Boykinia jamesii*. It is a mark of how early *P. patens* flowers that it should be in feathery fruit while these other alpine plants are in their peak flowering. The seed heads wave in the wind and glisten in the sun, waiting to ripen and blow away to germinate quickly. A meadow higher up was full of these fluffy seedheads, of both geum and pulsatilla. The only flowering plant of *P. patens* we could find in July was growing at the bottom of a 1m deep ditch and it had only two or three flowers, but these were worth the search. They were pale, silky, lavender cups backed with glistening white hairs. The plants have a basal cluster of deeply cut basal leaves. The flower stalks have a solitary flower above a ruff of three unstalked divided leaves. The flowers are 6cm wide with the tepals 2.5cm or more long. The leaves are palmately divided into segments and cut

again into narrow divisions. The plant grows 15–40cm tall and flowers from April to July, depending on altitude and aspect. It is, like the European *pulsatillas*, primarily a plant of grasslands, and ranges widely over Western and Central USA and Canada.

Whilst it is a plant of grassy meadows in Wyoming, *P. patens* prefers a different habitat in Alaska and the Yukon. It is still an early blooming plant but prefers dry, sandy or gravelly soil such as roadsides, south facing cliffs or steep slopes. Another subspecies extends well into Europe and it grows in Siberia and Russia as well.

I have grown *P. patens* from seed collected in Wyoming. My experience is that the plant is slower than *P. vernalis* to build up to flowering size. Sown in spring 1984, I have still not had any flowers.

Colour forms of *P. patens* exist, from pale lavender to deep purple, occasionally pink or even white. *P. patens* is the official state flower of South Dakota and the Province of Saskatchewan.

Pulsatilla patens wolfgangiana is reported from the Canadian prairies where it grows in grass stabilised badland slopes. It flowers in May and has lovely blue-purple flowers which turn the arid rangelands from brown to blue almost overnight. It is a companion of the white flowered *Phlox hoodii*.

Joseph Halda, in the SRGC Bulletin, describes *P. patens* in Asia (Fig. 24, p.75), growing south of Lake Baikal at 400m just where the larch forest ends. Growing in stony slopes were large golden-yellow flowers which resembled adonis. Here violet forms were rare. He reported that wood grouse gorged themselves on the flowers; they ate so many that they could hardly run and it was possible to club them. This yellow form of *P. patens* is distinct from *Pulsatilla aurea* from the Caucasian meadow lands (Fig. 27, p.77).

Pulsatilla occidentalis

The literature says the flowers of *P. occidentalis* are usually creamy white tinged with purple, and the foliage is grey green. The flowers we saw at Crater Lake in the Oregon High Cascades were almost a greenish white rather than a creamy white and the leaves were grass green. I did not find it to be as attractive a *pulsatilla* as the European *P. alpina*, although it is a splendid plant. It has a ring of prominent stamens. We found it growing in the black volcanic soil above the Crater Lake among rocks. In summer it receives practically no rain, but one winter 16m of snow fell on the area.

Perhaps it was the black arid habitat which detracted from the flowers' beauty. The area is spectacularly beautiful, with views north to the High Cascades towards Mounts Washington, Jefferson and Hood and from the crater's edge into the lake towards Wizard Island. The white *Pulsatilla occidentalis* sway in the breeze from the ridge down to the water's edge. The bank is so steep that they must be safe from all human predation. Even

despite the inaccessibility, they did not form large clumps, nor were the plants inclined to mass together. They preferred to be isolated from each other all over the slope.

P. occidentalis flowers at the same time as *Saxifraga rhomboidea*, *Lupinus lepidus lobbii*, *Mimulus lewisii* and *Erythronium grandiflorum*. It ranges down the Cascades and into the Sierra Nevada, and is a plant of gravelly soils rather than grasslands. I have not seen it in cultivation. It may be difficult to please but given good drainage it should be possible.

There are many other pulsatillas; I have written about those which I have seen. Some species like *P. pratensis* have smaller, tubular, nodding flowers. One thing is sure; the pulsatillas are the most regal plants of the mountains. I am keen to grow more. This year I have sown about 20 pots of seed from the distributions, plus some collected in Mongolia, which has already germinated. Time will tell what treasures this distant land holds. I hope that in a few years' time, my garden will contain the Mongol hordes. Perhaps there will be one truly noble individual who can be the Genghis Khan of Pulsatillas.

As a postscript, if any member has an excess of plants of *P. vulgaris* 'Budapest' or 'Mrs Van der Elst' please send them to Dunblane, where they can have a home beside their cousin, the Lady of the Snows.



Pulsatilla alpina apitifolia

Joel Smith

Growing for Gold

HAROLD ESSLEMONT

As I was convalescing in hospital recently following an accident I was greatly cheered by my gardening friends who came in regularly and talked about plants. This set me thinking about my fifty years as an alpine gardener and encouraged me to put down in print some of my experiences of growing and exhibiting plants.

Over a period of almost forty years I have been exhibiting regularly at SRGC Shows and for about thirty years presenting plants for awards to the Joint Rock Plant Committee of which I was a member for fourteen years. This was one of my favourite Committees. Most of the members had a specialised knowledge of certain groups of plants, so I learned a great deal from the discussions.

Going over my plant records recently, I find that overall I have received 43 Forrest Medals, 5 First Class Certificates (FCC), 9 Awards of Merit (AM), 11 Certificates of Preliminary Commendation (PC) and 37 Certificates of Cultural Commendation (CC).

My father had a large garden but he had a full-time gardener so he didn't work in it himself. Nevertheless I was always interested in the garden and can remember at Prep School receiving the Gardening Prizes for tending my small rectangle of ground, usually filled with bedding plants. I never received academic prizes at school so the Gardening Prizes were a bit of a bonus.

When I bought my present house in Aberdeen in 1937 I decided to concentrate on alpines so that I could grow a wide range of plants in a small space. The first thing I did was build a small rock garden.

My gardening career was interrupted by service in the RAF from 1941 to 1946. Towards the end of my service I was promoted to a staff appointment in Norfolk where, in my spare time, I continued my gardening by growing a large crop of tomatoes in old petrol tins.

Soon after I was back from the war I joined the local SRGC Group and later the AGS and the RHS. In 1947 I was widowed and I now found myself spending a lot of time in the garden.

I quickly acquired a small 10' aluminium glasshouse with makeshift blinds and an Access frame. The glasshouse bench was covered with gravel and I grew shade plants underneath the bench. On the bench I later had a large box filled with sand in which I plunged some specimen plants. Long tom pots were available and I bought a cast of various sizes from 4"-8" as well as some deep pans.

In 1960 I borrowed money to buy an 18' custom-built alpine house. Full details of this can be found in "An alpine house in Scotland" (SRGC Journal IX,149, 1964). In this house all the plants were plunged in sand as is the present system in the alpine house at the RBG Edinburgh.

In retrospect I would install minimal electric heating to keep the house just above freezing in winter. I found that plants at temperatures as low as -20°C couldn't take up water and died. I always admired Roy Elliott's vapour dispensers for insects but don't feel they are essential in the cool summers of north Scotland.

I grew most of my exhibition plants in pots in the alpine house but found that some plants such as primulas (excluding *P. allionii* and a few others) were best grown in a north border and potted up in the autumn for showing in the spring.

Shows

Jack Crosland and I soon became good friends with our love of alpiners although we were always keen rivals at Shows. We would regularly exchange whatever rarities we had spare.

In the late 1950s most Shows were two-day affairs so we evolved a system between us to enable us to compete regularly. Jack was a representative for Paton and Baldwin and so his time was more flexible than mine. On Thursday afternoon we would fill the car with plants and Jack would go off to Edinburgh or Glasgow or wherever, set up the exhibits and return at midnight. On Saturday we would both go down to the Show, collect our plants and prizes and return home late at night. This was our regular pattern for around five Shows a year. As Shows changed to one-day affairs on Saturdays, transport problems became much easier, even though it usually meant a very early start in the morning.

My first Forrest Medal was in 1956 for a small plant of *Shortia uniflora* covered with 36 flowers, grown under the staging.

I tended just to grow one plant of each species so that I could have a wide range of different things. For example, I acquired a small plant of a good form of *Androsace imbricata* (later *A. vandellii*) which never let me down. It was one of a number of plants I bought from Ingwersen's. It won its first Forrest Medal in 1958 and peaked at Edinburgh at the International Conference in 1961. There it was in line for the Forrest Medal along with a splendid plant of *Daphne petraea* from a Trade Stand. The judging was four apiece so the judges called in Mrs Boyd-Harvey to give a casting vote which she did in favour of the androsace. Afterwards she said she had done so because it was more difficult to grow.

I always admired *Paraquilegia grandiflora* at the Rentons' garden at Branklyn. The ever-generous Mrs Renton gave me a small plant which I grew in my Access frame but greenfly quickly killed it. Mrs Renton kindly

replaced it and I then grew it in the alpine house in my usual gritty mixture of three parts John Innes and one part chicken grit with a top-dressing of turkey grit. I then surrounded it with a collar of tufa. It went on to win two Forrest Medals and one Farrer Medal.

I only made one attempt at showing in London. I boxed up six plants in 1966 and set off for London by the night train. I took a taxi to Vincent Square, tabled my plants and then returned the next night. It was my most successful day ever. The *Paraquilegia* received the Farrer Medal for the best plant in the Show, and a Cultural Commendation, while another three of my six plants, *Haastia pulvinaris*, *Ranunculus sericophyllus* and *Ranunculus chordorhizos*, each received a Preliminary Commendation and a CC.

On another occasion I sent the *Paraquilegia* to Glasgow with a friend. He left the box in the station entrance while he went to get a taxi. While he was doing this a small boy came along and removed half the flowers on the *Paraquilegia*! In spite of this it was still in line for the Forrest but didn't quite make it.

Plants

Eritrichium nanum

I soon decided that it would be very helpful to see plants in their native habitats so, in 1951, I went on the first of many AGS tours led by Mr and Mrs Gerald Parker, this time to Switzerland. I enjoyed it so much and the price was so reasonable at £50 inclusive for two weeks that I made this my pattern for the next 14 years. In all, I visited the Swiss Alps, the Dolomites, Greece, Crete, Corfu, Rhodes, Cyprus and Turkey. On one Swiss tour I saw *Eritrichium nanum* for the first time. I had never seen it on the Show benches so I decided to take up the challenge. I collected a few plants from a cliff where they were as plentiful as daisies. In these days there were few restrictions on the export of alpine plants.*

It was a great struggle to prevent them damping-off in the winter and I never managed to keep them for more than three winters. Watering had to be immaculate. They were plunged in sand and, if further watering was needed, the pot was dipped in water for a few minutes. I managed to produce a plant for the 1958 Aberdeen Show with 70 flowers which won the Forrest Medal. The ideal would have been to grow *Eritrichium* from seed but I was never able to obtain viable seed.

Dionysia aretioides

Dionysias can be the very devil to grow but I always found them fascinating. I received seed of *D. demawendica* (later *D. aretioides*) from an expedition to Iran and germinated a few. *Dionysias* had not been shown much until then and judges in the main did not seem to realise that

*Members will know that *Eritrichium nanum* is now a protected plant and should not be wild collected. Eds.

D. aretioides, coming from the moist Elburz valley, was one of the easier ones, certainly not as difficult as some androsaces. I exhibited a well-flowered but small plant in the Seed Class at Edinburgh in 1967. My usual practice in coming into a show was to have a quick look round to spot the Forrest Medal plant but I couldn't see it anywhere. To my surprise my seedling dionysia had received a First Prize and also the Forrest Medal. This plant gained another Forrest Medal in 1971 but I unfortunately neglected to take cuttings or save seed so I lost it. It is interesting in retrospect to read Show Reports in the early 1980s where pleas are made for judges to see beyond dionysias and give the top prizes to less fashionable genera!

Anchusa caespitosa

I grew this plant for a number of years and won a Forrest Medal in 1962 and also a Cultural Commendation. I grew it hard in a long tom pot surrounded by lumps of soft tufa. The advantage of hard growing is that it keeps the leaves shorter and allows the vivid blue flowers to be seen better.

Kelseya uniflora

All ambitious rock gardeners should try to have a 10-year project in hand. When I saw in Ingwersen's catalogue small plants of *Kelseya uniflora* for sale I bought one and planted it in a block of soft tufa, drilling a one inch hole right through the tufa. At first it looked ridiculous in a 10 inch pan but after 8 years it filled the pot and received a Cultural Commendation and a Forrest Medal.

Daphne petraea

At the same time as I bought the *Kelseya* I bought a plant of *Daphne petraea* on its own roots. I treated this in the same way as the *Kelseya* but used a lump of hard tufa this time. It took 14 years to reach winning size but was also rewarded with a Forrest Medal and a CC. This was without doubt the finest plant I ever grew.

I also grew *D. petraea grandiflora* grafted onto *D. mezereum* which took 8-10 years to become a show plant. One must be careful when repotting grafted plants of this daphne not to expose the rootstock as this almost inevitably leads to death of the whole plant. Jack Drake confirmed to me that he lost his good plant in this way.

Campanula morettiana

I collected cuttings of this species in the Alps, rooted them in peat and sand and found that, planted in holes bored right through a lump of soft tufa, they made a splendid pan. It is a spectacular plant but it is always too late for the spring shows although I did once win a Forrest Medal for it in the autumn show in North Berwick. This was a small plant of the white form in soil in a pot, but with only 3-4 flowers. Thank goodness judges nowadays take less account of rarity in awarding Forrest Medals. I am not

ashamed to admit that, over the years, I won a number of Forrest Medals with plants which were rare but which could not really be called “the best plant in the Show”.

Jankaea heldreichii

This is rarely seen on Show benches. I obtained a plant from Henri Correvon while in Switzerland with which I won a Forrest Medal at Dunfermline in 1961 with three flowers! It is essential to remember that this is a crevice plant and that it should not be over-potted. I lost it by re-potting the year after getting the Forrest. I now grow it in a medium size double pot with a neck of tufa. The space between the two pots consists of peat and sand, kept damp enough to create the moist atmosphere it likes. It is interesting to note that the RBG Edinburgh now propagate it by leaf cuttings.

Draba mollissima

I suppose I must have obtained my first plant of *Draba mollissima* in about 1960. As a five-year old small plant it settled down quickly and in a few years was on the Show benches. It could be guaranteed to flower well every year. In all it gained three Forrest Medals (in 1965, 66 and 76) as well as an FCC and a CC in 1976 when it had around 1500 flowers. It was then 21 years old and I decided that it was really too big in its 12" pot to take to shows. Accordingly I gave it to Alf Evans as a christening plant for the new alpine house at the RBG. It is still there after 13 years so that it is now an impressive 34 years of age. It is now in the largest available pan in the RBG and recently received a Farrer Medal for the best plant at an AGS Show.

Fritillaria gibbosa

Judges rarely give Forrest Medals to bulbs but I did manage to get one for *Fritillaria gibbosa* in Edinburgh in 1969 as well as an AM in 1984. These bulbs were from the BSBE expedition to Iran in 1969 of which Brian Mathew was a member and in which I had a share. They are now 25 years old but have hardly increased in number, just producing a little rice from time to time. It seems to be self-sterile and only produced seed once, when I obtained pollen from a friend's plant. It should be re-potted every year when dormant and grown in a sand plunge bed, only being watered when growth appears. I have passed this plant on to a keen exhibitor so it should still continue to grace the Show benches.

Kalmiopsis leachiana 'M. le Piniec'

I obtained my plant from the USA and have grown it for many years in an open border in peaty soil. I pot it up for Shows when the buds show colour and then cut back the flowering stems immediately after flowering, trimming it into shape to allow fresh growth to emerge in the summer. This plant received a Forrest Medal in 1965 and an FCC in 1988.

Phlox triovulata

This is a beautiful plant in a pot when seen coming up through soft tufa. I obtained a Forrest Medal for it in Edinburgh in 1966.

I wrote an article for the AGS Bulletin (Alpine Anthology, Vol. 36, 110, 1968) describing a successful method for producing offsets. The parent plant is potted in a large orchid pot (with holes at the side), plunged in a large pot with peat and sand. The roots run through the holes in the orchid pot and eventually produce small plants in the space.

Cassiope wardii

I obtained a rooted layer of *Cassiope wardii* from Jack Crosland from a plant with which he had won a Forrest Medal. He originally got his plant from the late Bobby Masterton at Cluny who was successful in propagating from rooted layers. It seems almost impossible from conventional stem cuttings. I grew my plant in a typical ericaceous compost and kept it plunged in an open frame, closed in winter and given a light shade in summer.

Raoulia eximia

I think I must be unique in winning a Forrest Medal with a dead or almost dead plant. This I achieved at a Show in 1964 with a large pan of *Raoulia eximia* which very definitely expired very soon after if it wasn't already dead at the Show. It was a large plant which I had obtained from a friend in New Zealand.

It is important not to keep it too dry in winter. It needs more moisture than you might think from its appearance but in nature it receives nightly mist up in the mountains. I certainly regularly give it a spray throughout the summer.

I have now come to the end of my active gardening career and am more convinced than ever of the adage that a gardener needs two lives – one to learn what to do, the second to do it. We alpine gardeners are fortunate in having a wonderful and relaxing hobby. I have had forty years of fascination and interest which I have never regretted for a moment.

When the world wearies and society ceases to satisfy there is always the garden.

(This article was dictated by Harold Esslemont and edited for publication by Alastair McKelvie who researched many of the facts and is responsible for any errors).

Some Western American Alpines, A Personal Commentary: Part Three

MIKE AND POLLY STONE

Ranunculaceae

As we progress down the alphabet, reaching this family marks a return to more familiar territory after the American specialities of *Phlox*, *Eriogonum* and *Lewisia*. Most of the species we found within the buttercup family have their counterparts in the Old World; and the parallels are worth drawing, as they may give our European based readers an instant impression of the plants.

There is something very appealing about the basic simplicity of the buttercup flower; it has a certain functional elegance, a concept also found in engineering and mathematics. A slender reinforced-concrete arched bridge can actually enhance a scene, and be rather more attractive than much modern so-called sculpture. "Function defines form" as someone once said.

Starting with Anemone, the rhizomatous *A. oregana* is clearly a rather more delicate and refined equivalent of our own *A. nemorosa*. Like the latter, its colour can vary from reddish purple through lavender to blue, white or pale pink. It is typically a plant of the cool mountain forests in the Cascades of Oregon and Washington, but can apparently extend onto open hillsides. We were delighted to find a very beautiful deep china blue form on Mount Hood, opening from darkest inky-blue buds.

Higher up on these volcanic cones in the pumice desert zone, there grows *A. drummondii*. This has often been compared with *A. baldensis* of the European Alps, frequently having the same bluish reverse to the ample sepals, followed by globular woolly seedheads. There are differences in style however; in our experience *A. baldensis* runs about producing single flowers here and there whereas *A. drummondii* forms many flowered upright clumps, to 30cm high. The latter's foliage is villous giving it a more mat appearance than the European plant. Its distribution extends beyond the Cascades, south to the Sierra and across onto the Northern Rockies. Plants from the northern part of the distribution are sometimes called *A. lithophylla*.

We have been rather disappointed with the forms of *A. multifida*

which we have raised from various seed exchanges, the dull red flowers being far too small for the size of plant. There are apparently dwarf forms of this continent-wide species in the western Rockies bordering the Great Basin. These have been segregated as *A. m.* var *tetonensis*. *A. lesseri* of horticulture belongs here somewhere.

There is, on the other hand, no doubt concerning the dwarfness of the arctic alpine *A. parviflora*. The prospective grower should not be deterred by the name, most of the plants we saw were below 10cm, and white flowers around 2cm in diameter are quite showy on this scale. Centred on Alaska and the Yukon, it is distributed across Arctic Canada and down the Rockies to Montana. Apparently absent from Wyoming it reappears (as a post glacial relic?) in Colorado, both on the tundra and in high cold woods. The three lobed foliage is distinctly less cut than other anemones. Like many cold growing alpinines it is said to be difficult in cultivation; hopefully it may well appreciate northern Scotland.

Another Anemone with a disjunct population in Colorado is *A. narcissiflora*. We treat the typical European Alps form of this circumpolar species as an herbaceous border plant where its heads of white flowers, appearing relatively early, are most welcome. The Colorado variant has rather larger flowers on shorter stems, generally around 30cm, and has consequently been given the status of *A. n. zephyra* (Fig. 29, p.95). Normally white, we found a dark-foliaged pale lemon form growing in a shallow gully cut into a ridge top in central Colorado. The flowers, around 3cm across, were carried singly or in twos, on stems of 15cm or less. All in all, a highly desirable plant, one of the best we had the good fortune to see.

Since it can be confused with *A. narcissiflora* in the wild, it might be as well to digress from Anemone for a moment and mention *Trollius laxus albiflorus*. Unlike the European globeflower the latter opens its flowers out flat, and has the same range of colours as *A. narcissiflora*: from white to rich cream. The two can occur together in central Colorado, but the *Trollius* is more widespread up the Rockies into Canada, across to British Columbia and thence down into Oregon. The Anemone is most easily distinguished by the conspicuous involucre, or whorl of hairy leaves, below the flower cluster, lacking in *Trollius*. The Anemone has roughly diamond-shaped sepals (the showy part of the flower in this genus) and no true petals, whereas the *Trollius* has more rounded sepals, and a ring of vestigial true petals between the sepals and the central boss of stamens. In our short experience, the *Trollius* was in rather moister ground, sometimes downright soggy!

Returning to anemones, the remaining American alpine species which we saw are perhaps, in an international context, better placed in *Pulsatilla*. This genus is segregated from *Anemone* on the grounds that the styles

elongate and become feathery in fruit. There can be few gardeners unfamiliar with the typical seed-heads of *Pulsatilla vulgaris*. Within Europe there are several variations on the pasque flower theme, such as *PP. montana*, *halleri* etc; but in the American west there is only one: *P. patens*. By some quirk of plant distribution this last also occurs in Eastern Europe, and across the north of Asia. The American populations have been called *P. p. multifida* with synonyms *P.* or *A. ludoviciana* and *nutalliana*. It is clearly an adaptable plant, able to grow in prairie and alpine tundra alike, always flowering as soon as the snow retreats. 1988 was an early season, and even on top of the Beartooth Plateau *P. patens* had already ripened its seed by late July. This gave us a chance to introduce an alpine form to our garden.

P. patens within the US is generally a softer colour than *P. vulgaris*, typically a pale lavender. The foliage differs in that the primary divisions are palmately subdivided, i.e., the secondary lobes spread from a point. We also grow a pale yellow form as *P. patens flavescens* originating in Siberia (Fig. 24, p.75). Incidentally, this has recently been confused in cultivation with *Pulsatilla aurea* from the Caucasus (Fig. 27, p.77). The latter is clearly a member of the *P. alpina* clan, with wide-open, upward facing flowers developing well before the foliage extends. Its flowers are a rich golden yellow, much deeper than the alpine *P. alpina apiifolia* which was better served by its old name of *P. a. sulphurea*.

The American representative of this group is *P. occidentalis* which, although it does share some of *P. patens* range, for example in Montana, extends further south and west into the Cascades and Sierra. It also relates to *P. alpina* in being exclusively a mountain plant, but lacks the purity of whiteness of the European. Plants we saw had pale cream flowers reminding us of some we saw in Austria where the calcicole *P. alpina alpina* had met and mingled with its acidophyllous counterpart *P. a. apiifolia*.

P. occidentalis is well worth growing, for its own sake, the foliage is more finely divided than in the others, and of a beautiful bright green as it emerges. The seed heads are larger and elongated, with the feathery tails tending to be angled downwards, for all the world like a miniature of one of Tina Turner's wigs. An extensive stand in the wild is most striking. All these pulsatillas should be raised from autumn sown seed, planted in rich scree and left undisturbed thereafter.

The *Ranunculus eschscholtzii* group

Every visitor to the European Alps must be familiar with the magnificent but horticulturally intractable *Ranunculus glacialis*. In the Western mountains much the same ecological niche is occupied by *Ranunculus eschscholtzii* (s.l.) (p.103, diagrams A-D). Picture a brilliantly glossy yellow-flowered *R. glacialis*, flowering in the bare loose soil recently vacated by a retreating snow-bank, and you won't go far wrong.

The *R. eschscholtzii* complex has been divided by various authors into a number of varieties and/or subspecies, depending chiefly on the nature of the dissection of the basal foliage. The current Flora of Utah, which takes a pragmatic view of most taxonomic problems, states bluntly that the importance of these distinctions is unclear. From the gardener's point of view the precise degree of the leaf dissection is far less important than the ratio of flower size to stem height. We have raised quite a number of exotic buttercups over the years only to discard them as no improvement on the *R. repens* running wild in our grass. The latest disappointment is *R. helenae* from the Caucasus. Similarly some of the smaller flowered white forms of *Erigeron compositus* fail the "lawn test" when compared with *Bellis perennis*.

The *R. eschscholtzii* group, as a whole, has a very wide range from Alaska and the Yukon down to California and extends eastwards to the Canadian Rockies, thence south as far as Arizona. It crosses onto the Siberian side of the Bering Strait where it overlaps with *R. glacialis chamissonis*. A cream-flowered beauty with hybrid vigour: now there's a thought for an intrepid plant hunter!

R. eschscholtzii itself has basal leaves which are divided around half-way to the base into three main lobes, these then terminate with relatively broad blunt teeth (p.103, diagram A). This typical phase is not a high alpine, but a plant of moist subalpine forests and meadows; in fact it has the American vernacular name of "Subalpine buttercup". It is probably one of the less horticulturally desirable members of the group, often failing the "lawn-test". However, in many parts of its range it extends upwards to occupy the *R. glacialis* type snow melt habitat. Some of these alpine populations were treated in the past as separate species, and were included as such in a recent issue of *The Rock Garden*. With one possible exception, they are perhaps better placed as varieties of *R. eschscholtzii*. We shall consider them in order of increasing leaf dissection.

R. e. var *oxynotus* has foliage of the same basic shape as typical *R. eschscholtzii*, but apparently slightly fleshier, the leaf bases persisting for 2-3 years around the thicker caudex. It is a Californian alpine of the Sierra Nevada and White Mountains which we have not yet seen.

Next, we come to those forms still with only moderately dissected foliage, but the segments are more sharply pointed or acute (p.103, diagram B). In the Cascade - Sierra region this is referred to as *R. e. suksdorfii*, while a recent Wyoming manual uses the epithet *R. e. eximius*, also at varietal level. The descriptions match, so it is perhaps best to follow Hitchcock and Cronquist and regard them as synonymous. We found a superb group of this variety high on the Beartooth Plateau, the plants were slightly taller on average than the *R. adoneus* we had seen earlier in Colorado (see below), at about 15cm, forming larger multi-stemmed clumps topped with huge



Fig 28 *Saxifraga chrysantha* and *Claytonia megarrhiza*, Mount Evans, Colorado (p102)

Polly Stone



Fig 29 *Anemone narcissiflora zephyra*, central Colorado (p91)

Polly Stone

Fig 30 *Ranunculus adoneus*, Colorado (p98)

Polly Stone





Fig 31 *Caltha leptosepala*, Mosquito Range, Colorado (p99)

Polly Stone

Fig 32 *Boykinia (Telesonix) jamesii*, Pike's Peak, Colorado (p102)

Polly Stone

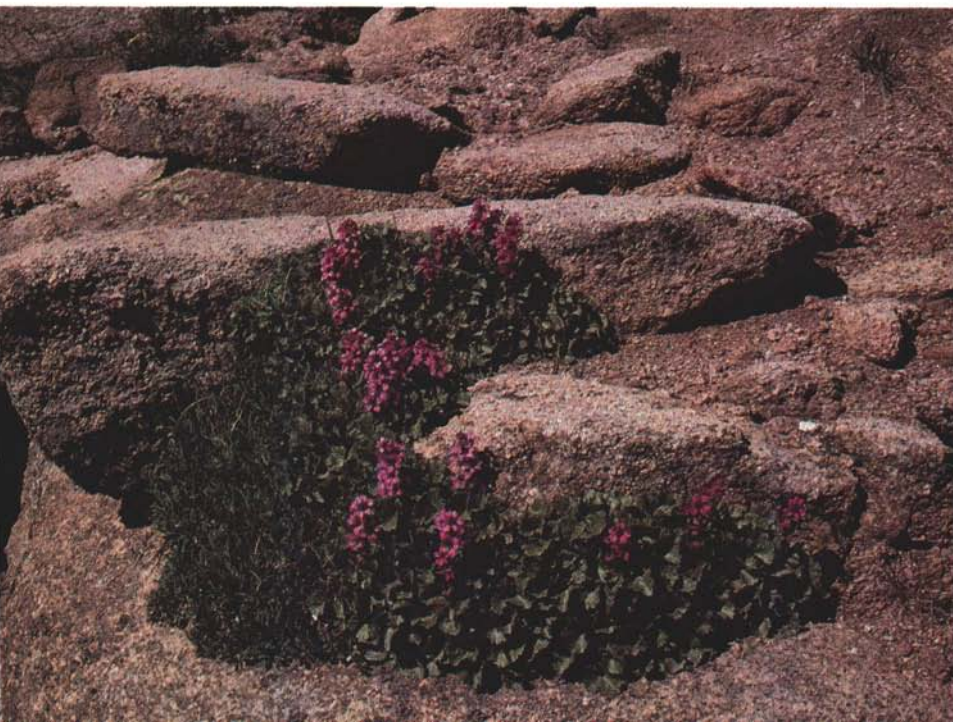




Fig 33 *Darlingtonia californica*, South Oregon (pp41,101)

Polly Stone

glossy golden saucers fully 3–4cm in diameter. So far it has proved growable, and we live in hope that our climate can keep it in character on the scree. Both *R. e. eximius* and *R. e. suksdorfii* were treated as species in the *Rock Garden* survey.

A further stage in leaf-division takes us to *R. e. trisectus*, with a distribution extending from east Oregon through Idaho to Utah and Wyoming. We discovered plants fitting this variety in the White Cloud Peaks of Idaho (p.103, diagram C). A smaller plant than the above-mentioned super *R. e. eximius*, around 10cm high, with flowers up to 2cm across, the three primary leaf-lobes are divided to very near the base, but the secondary segments are relatively broad and obtuse. It was growing in bare grey-black clay and rubble, the sort of medium builders leave in a new garden. We draw the line at re-creating these conditions, and suspect that plants transferred to the garden climate would soon show their disapproval too. Cultivation is never that simple!

Finally, we come to the most finely dissected of all: *R. adoneus* (Fig. 30 p.95) which has retained its species rank in most books, although it has sometimes been referred to as *R. eschscholtzii* var *alpinus*. Although often thought of as a plant of the Colorado tundra, its distribution extends north to Montana, and westwards through Utah to parts of Idaho. It is **not** apparently found in the Cascades of Washington or Oregon (Mount Evans is, of course, just west of Denver, Colorado). One reason it is regarded as a species could be that *R. eschscholtzii trisectus* is absent from Colorado, thus maintaining a clear division (compare diagrams A and B with D). In *R. adoneus* the foliage is divided into linear or narrowly oblong segments, at most 2mm wide. Most populations we saw comprised relatively small plants, with only two or three stems of 10cm or so, but carrying flowers equally as large as *R. e. eximius*, up to 4cm in diameter. In one north-facing hollow, about 500m long by 100m or so wide, there were millions of spaced plants, many in running snow melt. A magnificent spectacle, reminding us of the display of *R. glacialis* on the flats beyond Lac Savine in the French Alps!

This taxon has the highest ratio of flower size to stem height and foliage but, in the way of things, is probably going to be the least amenable in the garden. We intend to keep trying!

R. macauleyi (sic) cannot be passed by without comment, since it too has been mentioned in consort with the *R. eschscholtzii* group. In fact, its sepals, covered with black or reddish-brown hairs, indicate a closer relationship with the arctic *R. nivalis*, found for example in Norway and Spitzbergen. *R. macauleyi* has somewhat truncate leaves with rounded shallow teeth at the apex. It is found over a relatively limited range from west-central Colorado southwards into New Mexico, growing in rocky

alpine meadows. Said not to be a specialised snow-melt plant, it could well play the part of *R. bilobus*, if *R. adoneus* plays that of *R. glacialis*. It is a high priority for our next visit.

Finally we come right down in scale to the tiny *R. pygmaeus*, almost overlooked when searching for the finest *R. e. eximius* to photograph by the Beartooth snowbank. Only 2-3cm high, with flowers 1cm across, the former is a perfect miniature buttercup which, *pace* Farrer, we thought worthy of introduction. The tiny three or five lobed fleshy leaves are perfectly in proportion. A plant we brought back grew very well, setting copious seed in 1989, which germinated immediately on being sown fresh. Some seed which Poll missed even germinated in neighbouring pots. We have a feeling the individual plants may not be very long lived; but then many of the choice European ranunculi tend to die out unless regularly divided.

A colony of this diminutive species on a trough together with other small fry, such as *Hutchinsia brevicaule*, *Gentiana pumila pumila*, or *Primula minutissima* could be a charming sight indeed!

Returning to the garden, the white flowered American calthas are worth consideration. While they cannot compete with the Himalayan *C. palustris alba* for ease or vigour, neither do they become so gross later on in seed. There are two species, possibly three; the more widespread being *C. leptosepala*, from Alaska down to Colorado, with its relatively elongated leaves (Fig. 31, p.96). The finest stands we found were growing along snow-melt streams together with *Primula parryi*, their clumps of white setting off the primula beautifully. Many were dark blue in bud, retaining a pronounced bluish reverse to the sepals as the flowers opened. The sepals vary in number from six to twelve; semi-doubles were quite common.

The closely related *C. biflora* has a much narrower distribution down the West Coast in the Cascade – Sierra. It differs in having more rounded leaf blades, and more starry flowers. We have found it more adaptable in the garden, tolerant of drier soils than in the wild, and willing to flower regularly. *C. howellii* from California is really just a smaller version of this, sometimes regarded as *C. biflora* var *howellii*. Seedlings from an autumn 1988 sowing flowered in the spring of 1990, while still in 7cm pots, so it obviously retains the tractability of the larger type plant.

From bog to scree and our last member of the Ranunculaceae: *Clematis tenuiloba*. Fred Case commented that although he'd been recommending this plant for many years, no-one had taken much notice until Henrik Zetterlund took some to Europe. As Henrik's photograph shows (**Rock Garden** 81 p415) a good colour form is well worth growing. Like *Aquilegia jonesii* it was in seed when we reached the Bighorns, but our photographer's loss is the gardener's gain. Fred Hunt flowered one of his resulting *Aquilegia* seedlings in the autumn of 1989.

Rosaceae

While *Clematis tenuiloba* ran about in the limestone rubble, on some of the nearby vertical faces cushions of a much better known alpine were plastered – *Kelseya uniflora*. We have grown this for many years on a winter covered trough, but have never been particularly impressed with the squinny pink stars it reluctantly produces. Technically a shrub, its tight mats flowering down the rock faces were really quite striking, lacking the dead patches one often sees on wild cushion-plants.

Like *Kelseya*, *Petrophytum* was once included in the genus *Spiraea*. Having seen *Petrophytum caespitosum* spraying its little creamy spikes from tight glaucous mats, wedged into crevices in the walls of a desert canyon in Idaho, we can understand why it is difficult for us to maintain. Spread all the way from California to South Dakota, *P. caespitosum* is, according to Roy Davidson, never really alpine. On the other hand, *P. hendersonii* is an alpine endemic of the Olympic Mountains. We find it very much easier in cultivation, but its cushions are looser and far less blue – “ain’t it the way”!

Yet another *Spiraea* relative is *Luetkea pectinata*, whose bright green spreading mats have adorned our garden from peat-beds to scree for many years. Superficially like a mossy saxifrage, the leaves are more finely crisped, and being evergreen are particularly notable in winter. The flowers are nothing special – just creamy spikes, dying untidily and detracting from the foliage effect. Knowing how well *Luetkea* does here in moist shade, it was quite a surprise to see it thriving in full sun on the pumice slopes of Mount Hood; but there must be adequate moisture available underground.

Often growing where snow lies late, *Luetkea* is not restricted to the Cascades, but occurs from Alaska to California and east to Montana. It is another example of the curious convergence in appearance of some members of the Rosaceae with equivalents in Saxifragaceae, just like *Aruncus* with *Astilbe*.

Lower down on Mount Hood, and again later on Mount Rainier, in the high forests, we had another surprise of a different kind, a plant form we didn’t realise existed, a tiny trailing bramble, with white strawberry flowers, perfectly in proportion. There are two species, the trifoliate *Rubus lasiococcus*, and *R. pedatus* with five-lobed leaves. Both are excellent prospects as delicate ground-covers for the woodland garden, and should prove easy to control as they spread only by overground stolons. *R. lasiococcus* is the more strictly montane of the two, restricted to the Cascades and Olympics, whereas *R. pedatus* is more widespread horizontally and vertically.

Our club emblem, *Dryas octopetala*, must be one of the most successful and cosmopolitan of arctic-alpines, so it is hardly surprising to find it throughout the Rockies. At the southern end of its range in Colorado it occurs at high altitude, where it is a primary coloniser. Opinions differ as to how many taxa

there are within the genus *Dryas*, one American study claimed eight intersterile species in that continent alone! Be that as it may, the Colorado populations are often assigned to *D. o. var hookeriana*. We found them somewhat tighter in growth, but otherwise very similar to the European plant. Some did have slightly off-white flowers. We grow *Dryas* from Scotland, Norway, and the French Alps. The French form is perhaps the best garden plant, with large freely produced flowers and an obvious silvery reverse to the foliage.

Sarraceniaceae

Among the many sights which Fred and “Boots” Case wished to show us on our travels together were the Californian “big-trees” and a Darlingtonia-bog. While neither is really our thing, we had to admit that each was pretty impressive in its own way.

The Californian pitcher plant, *Darlingtonia californica*, (Fig. 33, p.97) was larger than we had visualised, up to 0.5m high. Our first sighting gave us quite a start, the serried ranks of pitchers appearing to menace us like so many angry cobras. Standing fully exposed to the Oregon sun, on a south facing slope, but with their feet in trickling water, it is hardly surprising that our attempts at cultivation have failed. So hot was it here that I soon longed for the high ridges and cool breezes of the alpine zone.

We have raised several species of eastern pitcher plants – *Sarracenia*s, from seed using our sphagnum method and standing the seedpots in saucers of water. Germinating *Darlingtonia* this way was no problem, but our seedlings have always died when their pots are frozen hard in winter. *Darlingtonia californica* differs from *Sarracenia* in possessing a strange twin-lobed beard dangling from the hood in front of the entrance to the insect trap.

Saxifragaceae

As it is with those other classic backbone genera of the rock garden, *Primula* and *Gentiana*, so it is with *Saxifraga*; the New World has only a little to add to the Old. There are quite a number of saxifrages in the American mountains, but many fall into the ‘more curious than beautiful’ category. *Saxifraga tolmei*, to be encountered frequently high on the Cascade volcanoes is a typical example with its fleshy sedum-like leaves and dirty greeny-yellowish-white stars. Said to be very difficult to grow, it will appeal only to those who like a challenge for its own sake.

We are growing *SS. bronchialis*, *cherlerioides* and *tricuspidata* on our troughs. The first two are very like their European relatives in the *Trachophyllum* section, *SS. aspera* and *bryoides*. *S. tricuspidata* forms a looser dark green cushion but retains the usual off-white spotted flowers of this group.

S. rhomboidea is a *Micranthes saxifrage* found in the Rockies from Montana southwards. From a rosette of leaves lying flat on the ground, it throws up a single stem to around 20cm, carrying a congested head of tiny white flowers. While *S. rhombioides* is scarcely in the first rank of saxifrages, it has a neighbour atop the same ranges which gives way to none – *S. chrysantha* (Fig. 28, p.94). From a low mat of rosettes, each 1-2cm across, arise stems of around 4-6cm, carrying single relatively large golden flowers, more or less spotted with orange. Like the better known circumpolar *S. flagellaris*, it is a member of the *Ciliatae* (*Hirculus*) section but differs from the latter in its hairless leaves, and in not producing runners. *S. chrysantha* is closely related to the arctic *S. serpyllifolia*, under whose name it is sometimes found. Just reaching Montana in the Beartooth Range, it can be found southwards from there into New Mexico on talus slopes at high altitude.

Once included as a Saxifrage, *Boykinia (Telesonix) jamesii* is another of the classic Rocky Mountain plants all alpine enthusiasts would wish to see. We were very fortunate to find it, in all its glory, on Pike's Peak. The stout, shortly creeping rootstocks carry long-petioled rounded leaves, with scalloped edges. The inflorescence is an upright cyme with leaf-like bracts among the flowers, the spatulate petals giving an open-centred feel to the individual blossom.

In the Pike's Peak form the flowers are large and a rich bright magenta pink. Further north in the Bighorns, the paler petals were scarcely longer than the sepals. The dominant dark centres give the flowers an overall purplish hue. The two populations also differ in habitat, the Pike's Peak plants form large mats in a coarse granite sand at the base of rock outcrops (Fig. 32, p.96), whereas the northern ones were in limestone crevices alongside such as *Kelseya uniflora*. The latter population also had smaller, darker green leaves in the wild, but this colour difference has disappeared in cultivation here.

The two forms are, to our mind, at least as distinct as say, *Primula daonensis* is from *P. hirsuta*, and we would agree with the epithet *B. j. var heucheriformis* for the limestone plants. *Boykinia jamesii* has apparently been found at an intermediate station in the Medicine Bow range of south Wyoming. It would be interesting to know which form these take after!

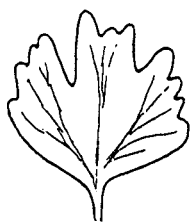
We have grown the Himalayan Grass of Parnassus *Parnassia nubigena* for very many years, having raised it originally from Nepalese seed, but *P. fimbriata* had always eluded us. Several sowings from various exchanges failed to produce a single germination! Found in moist acid soils all over the American West, *P. fimbriata* has the typical long stalked reniform leaves of the genus. Now that we have the plants, it appears quite easy to grow in a cool shady bed, the only problem being its attraction for slugs, particularly the delicate flower stems. It may never match the ease and vigour of its Himalayan cousin, but is well worth attempting for the distinctive flowers, the petals beautifully fringed towards their bases.

Farrer, in 'The English Rock Garden' dismisses the 'Leatherleaf saxifrage' in one short sentence: "Leptarrhenas (sic) are worthless dowds". As far as we can ascertain, the genus is monotypic, and *Leptarrhena pyrolifolia* is far from worthless as a foliage plant, especially attractive in spring as the new growth develops. The plant forms close mats of horizontally creeping rhizomes, rooting down as they go like an iris. The thick obovate leaves are bright green when young, paler beneath, becoming dark green on the upper surface, increasing the contrast with the silvery reverse as the season advances. The leaves, which have serrate margins, persist all year. They can apparently be anything from 3-15cm long, but with us only attain some 6cm. The inflorescence is congested atop a relatively tall scape, the white petals at 2mm scarcely exceeding the calyces, the stamens prominent, so the whole gives the impression of a greenish cluster. At home this species inhabits stream banks and moist meadows in the mountains, from Alaska southwards to the Cascades of Oregon and down the Rockies, just crossing the American border again at Glacier National Park, Montana.

With such a northerly distribution and habitat, it is entirely possible that *L. pyrolifolia* may fail altogether or be thoroughly miserable in hot dry gardens, justifying Farrer's condemnation. Persistent evergreen leaves are a drawback in the garden if they are browned or otherwise damaged. That said, we must add that we find it easy and vigorous in a cool moist north-facing border where it associates well with Trilliums.

to be continued . . .

Variation within *Ranunculus eschscholtzii* s.l.



A

R. e. var *eschscholtzii*
Subalpine woods, Wyoming



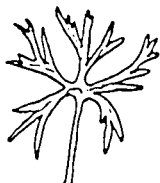
B

R. e. var *eximius*
Snowpatch, Beartooth Plateau



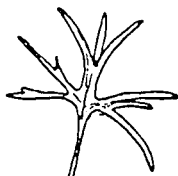
C

R. e. var *trisectus*
Cirque, White Cloud Peaks, Idaho



D

R. adoneus (*R. e. alpinus*)
Snowpatches, Colorado Rockies



The Sterilisation of Composts – Principles, and Methods using Conventional and Microwave Ovens

EVELYN STEVENS

In this age of 'convenience' goods many gardeners buy their composts in sealed polythene bags from garden centres, and feel little need to know about compost sterilisation. Nevertheless there are still people, myself included, who make their own composts from the raw materials of loam, leaf-mould/leaf-litter, peat and coarse sand or grit. Further, even if we buy ready-made composts, these do not remain sterile once the bags have been opened and the compost is in use, and it is worthwhile to understand what is implied by this concept of sterilisation.

The principles of sterilisation

A truly sterile soil or compost would be one in which there were no living organisms. In my previous articles (Rock Garden XX, 1987, p277 and XXI, 1989, p278), I emphasised that soils are complex mixtures of materials, and that many of the different components are important to plants for healthy growth. Not only are there inorganic soil particles, air spaces and films of water covering the soil particles, but there are also organic components.

The organic components of the soil can be divided into two categories, dead organic material and living organisms. A major fraction of the living organisms on a bulk (biomass) basis are plant roots themselves, but apart from these, there are myriad other organisms. These include numerous species of micro-organisms (soil bacteria and fungi), insects, mites, centipedes, earthworms, nematode worms, slugs and weed seeds. Many of these have a vital bearing on plant growth, some effects being beneficial and/or essential and others harmful.

Many of the organisms in the soil, for example, many of the bacteria and fungi, earthworms, mites and insect larvae are beneficial to plants in that they are responsible for the breaking down of dead organisms. Dead organisms constitute reservoirs of 'locked up' plant nutrients – reservoirs, because many of the chemicals for plant nutrition are derived from the recycling of dead organisms, (most of the requirements for nitrogen come from this source), and locked up because many of the chemicals of which they are made are complex ones which need to be broken

down to simple chemicals in solution. Comparing a piece of flesh with a solution of salt in water helps one to visualise the complexity involved in the processes of breaking down dead organisms by a wide variety of soil organisms.

The aim when soil or compost is sterilised for gardening, is to retain alive the beneficial organisms, while killing the harmful ones. It is readily understandable that it would be impossible to achieve perfect differential killing, and what is actually practised is 'partial sterilisation'. In partial sterilisation the numbers of all organisms in the soil, both harmful and beneficial, are greatly reduced, but conditions are employed which aim to minimise the deaths of beneficial organisms and maximise the numbers of pathogenic ones killed. Another aspect of this is that competition exists for nutrients amongst micro-organisms in the soil. This means, for example, that if a batch of seedlings were sown into a completely sterile compost, and if this subsequently became infected with the air-borne spores of a pathogenic fungus, the competitors of the latter might not be present and the seedlings would be very likely to succumb to the fungus, which would be thriving extra well in the absence of competitors.

Heat sterilisation

The most commonly used methods for soil or compost sterilisation involve heating in one way or another. Heating not only kills living organisms, it also affects the chemistry of the non-living components of the soil. Such effects are very complex and are not yet fully understood, but it has been clearly established that a variety of soluble substances toxic to plants may be produced, both from the organic and inorganic components of the soil, when soil is heated too much. Some of these soluble toxic substances are, in fact, nutrients when present in normal amounts, but when enhanced amounts are released into solution in the soil by the action of heat, they act as toxins. So not only does heating produce toxins, but it also wastes chemicals which would otherwise be released gradually in small amounts to be used as plant nutrients. It is worth knowing that over-heated composts are not permanently toxic: the toxic effects gradually diminish with time.

It is therefore not a simple matter to kill harmful organisms in soils and composts, while leaving alive the beneficial ones and avoiding adverse chemical changes to the soil. It comes as no surprise to realise that the methods designed for compost sterilisation involve compromises, and fairly careful regimes of treatment.

As far as chemical changes are concerned, suffice it to say that it has been established that toxicity can be avoided if we ensure that the soil or compost to be sterilised is moist (i.e. not too dry or very wet) and avoid heating it to too high a temperature (temperatures above 100°C (212°F)

are very harmful) or for too long. So it is desirable to use a thermometer and clock, and to bear in mind that the aim is to produce a dry steam within the mass of compost to perform the sterilising process.

Experiments have shown the conditions which are effective in killing various types of plant pathogens. Duration of heating is an important factor. Heating to lower temperatures for a longer period of time is better than higher temperatures for a shorter time as this avoids chemical changes in the soil and also reduces the number of beneficial micro-organisms killed. Some data on the temperatures that kill a number of pathogens in soils are as follows:

Nematodes and eelworms	49° (120°F) for 10 minutes
Most fungi	50°C (122°F) for 10 minutes
Insects and slugs	66°C (150°F)
Most weed seeds	77°C (170°F) for 10 minutes
Some fungi	82°C (180°F) for 10 minutes

Heating of composts to sterilise them can be done in various ways. One method is to use an electric steam steriliser, but it is not one which I have used, so I cannot comment on it. A method I have found very simple is based on that advocated by Royton Heath (1981) using a kitchen oven – maybe not so accessible to the man of the house! A turkey tin (30cm x 35cm) is filled with either sieved, loosely-packed and moist loam or leaf-mould/leaf-litter (mixtures of materials should not be sterilised together) to an even depth of about 8cm, and then placed on a shelf in the middle of the oven which has been pre-heated to 82°C (180°F), and left there until the temperature reaches 77°-82°C (170°-180°F). I use a soil or sugar thermometer dipped into the mass of loam or leaf-mould to measure the temperature, and am careful not to let the temperature rise above 82°C (180°F). Also I am very conscious of the need to keep the treatment time as short as possible; it takes 15 to 20 minutes or maybe a bit longer. The material is then removed from the oven and laid out as a thin layer out-of-doors to cool down as quickly as possible, thereby reducing the amount of adverse changes in the chemical state of the soil and the number of deaths in the beneficial bacterial population. It is recommended that the materials are used when freshly sterilised, but I have often not heeded that advice and have not noticed any deleterious effects as a result.

Microwave sterilisation

Since January 1989 I have been the happy owner of a microwave oven – a birthday present from my mother-in-law, but I do not think she realised what one of its uses was to be! I have stopped using the ordinary oven and now use the microwave oven for sterilising. It is more convenient, quicker, and more economical in its use of electricity.

R. S. Ferriss (1984) has developed procedures for microwave radiation

treatment of soil to eliminate or reduce populations of soil-borne plant pathogens, and it was on the strength of this work that I changed to sterilising loam and leaf-mould in the microwave oven. Ferris compared microwave radiation treatment with fumigation with methyl-bromide-chloropicrin and with autoclaving (sterilising using a pressure cooker) and found that it caused fewer changes in certain aspects of soil chemistry, killed less of the beneficial soil bacteria and resulted in less recolonisation with certain pathogenic soil fungi. He concluded that microwave treatment could be a satisfactory method for home horticulturists to treat small amounts of potting compost.

The regime I have developed is as follows. The oven is a Matsui 170TC, 650W. I fill up a 4 litre plastic ice-cream box (18cm x 18cm x 18cm) with lightly compressed, evenly moistened, sieved loam, leaf-mould, or leaf-litter, and put it in the oven on high power for between 8 and 10 minutes. I find that it usually takes this time for the material to reach a temperature of about 80°C (176°F), I try to avoid having the temperature rise above 82°C (180°F), and certainly never let it rise above 90°C (195°F). Note that it is important not to leave the thermometer, if it has metal parts, inside the microwave oven while it is on. I then spread the material out in a thin layer out-of-doors to cool down as quickly as possible.

Uses of sterilised composts

It obviously takes time, effort and money to produce sterilised compost, and therefore it is worth considering when to use it and when it is less necessary to do so. I will use a sterilised compost for plants which will be most at risk from attacks from pathogens of one sort or another, or will be at a disadvantage in the competition for nutrients. With these criteria in mind, I use sterilised compost for sowing seeds, pricking out seedlings, potting up rooted cuttings, potting on choice plants and potting up bulbs grown in the alpine house or bulb frame.

Seeds contain a rich abundance of nutrients, the purpose of which is to nourish the emerging seedlings. By sowing seeds in sterilised compost, the risk of attack by other organisms is minimised: for example, fungi, insect larvae or slugs may steal these stores of nutrients while the seeds wait for conditions suitable for germination. Sterilised compost will also eliminate competition from germinating weed seedlings – with the additional benefit of giving you confidence that any emerging seedlings are the ones you sowed and not the weeds!

I also use sterilised compost for potting up both seedlings and rooted cuttings. In both cases one is dealing with very delicate young tissues; with seedlings, the whole of the plant is fragile and, with rooted cuttings, the newly formed root systems are particularly so. It is virtually impossible not to cause some damage to the outer protective layers of these delicate

young tissues. Until repair to the damage has been achieved, they are, for example, particularly vulnerable to fungal attack. Another aspect of this is that the total mass of a tiny seedling is very small, and often this applies to rooted cuttings as well; attack to any part of them will represent a large proportion of the whole. Therefore repair may well not have been achieved before the whole of the young plant has succumbed totally to fungal attack or the munching of a slug.

Another group of plants which I favour with sterilised composts are those I regard as 'difficult', or particularly valuable and choice. These two factors often amount to the same thing! These plants include the high alpine like aretian androsaces, *Dicentra pusilla*, *Paraquilegia anemonoides*, *Primula allionii* and so on – in fact, many of the plants to which people accord the protection of an alpine house. I will always treat these plants to sterile compost no matter how big they might become; I would rather be safe than sorry, and they are worth every effort.

I have another category of what I regard as 'special' or 'not so easy' plants that I grow in pots. This is in order to enjoy them as well-grown plants because they have the benefit of alpine house or frame protection against the ravages of the rains and winds of spring. I also like to be able to take them to the Shows. These I initially treat to sterilised compost, but as the plants are moved on into bigger and bigger pots, I regard them as being so well established that this is no longer necessary. Examples of these have been *Primula* 'Beatrice Wooster', *Primula* 'Linda Pope', *Primula petiolaris*, *Rhododendron pumilum* and *Callianthemum anemonoides* in 15-22cm or even larger pots.

The last group of plants I favour with sterilised composts are pot-grown bulbs kept in the alpine house or frame. Bulbous plants comprise, by virtue of their storage organs, a rich and dormant reservoir of nutrients for much of the year. They are particularly susceptible to attack by many organisms, for example, fungi and slugs. I think it is well worthwhile to give them the best chance of avoiding onslaughts from their numerous enemies by surrounding them with sterilised compost – not that this will be a deterrent to marauding mice.

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Southern Iceland: Ash and Alpines

BRIAN KNIGHTS

Last year we finally decided that the time had arrived for us to indulge ourselves and fulfil the ambition we shared to holiday in Iceland. We chose a package based upon a hotel in Hveragerdi, about 35 kilometres from Reykjavik, and therefore the excursions were centred on the southern part of Iceland.

Siggi, our driver and guide, was very knowledgeable on all those aspects which would take visitors on a tour of Iceland: geology, birds and plants in particular. Indeed we had a most excellent week notwithstanding the moderate weather. The geology and the scenery were magnificent with a remarkable range of features which included extinct volcanic craters, thermal springs, waterfalls and glaciers. For me, however, what really thrilled were the plants and the way they were displayed.

We departed on the last day of June from Glasgow for ten days, the last three of which were spent in Reykjavik. During the latter time we visited the Botanic Garden. This was a good place to go, giving an idea of what could be grown in Iceland, but the latitude obviously precludes the range of possibilities which we enjoy. Pansies, for example, dominated bedding plants and there were few plantings of shrubs and bushes.

The greenhouse industry based on geothermal energy at Hveragerdi was also an unexpected diversion; top class in terms of display and maintenance of house plants, and the prices were modest in relation to other costs in Iceland.

As far as seeing the wild flora is concerned, our holiday was not ideal. We were in a party of 14 and interests were diverse. With bus trips to various sites of interest we could not stop at will to see everything that caught the eye or find the best plant to photograph. Some kind of self-drive arrangement may be better, possibly with camping facilities and perhaps based upon previously gained knowledge.

Books are expensive in Iceland and the published flora at £30 (at least) is no exception. It is a well illustrated and well written book with good colour photographs, and it is a help to have such a book to hand.

Although the flora of Iceland is relatively limited with only about 400 species, the northerly latitude means that not only are many of the plants so-called Arctic-Alpines but also many of these are found at low altitudes. More conveniently still, the history of recent volcanic activity in much of the country means that there is relatively little fine-graded soil. Mostly the

surface is composed of lava flows, coarse alluvial deposits and volcanic ash or cinder. As a result, plants tend to grow singly in a loosely structured soil similar to a coarsely graded scree.

With plants growing singly and a free draining soil, they are easy to see and many put on a superb display. There is no doubt that this is a most effective way to grow the plants we saw. What was even more remarkable to me was how sensitive to altitude the display was. Going up or down 50 metres would radically alter the dominant plants so that in one place a splendid show of *Silene acaulis* would catch the eye whilst it would be replaced down the road by clumps of *Dryas octopetala*. Thus, the zonation was as marked as were the plants themselves. *Silene acaulis* in one foot diameter mounds, almost hemispherical in shape, were a sight frequent and truly wonderful to behold, and I had not previously seen such splendid displays of *D. octopetala*. Members of the club would have been proud of the display of our emblem.

We only twice saw *Loiseleuria procumbens* and it also exhibited marked zonation. The first time it was growing along with *Cassiope hypnoides* and the pair of them plus other alpinines such as *Saxifraga oppositifolia*, which had essentially finished flowering by early July, also demonstrated another advantage of the natural method of 'gardening' found in Iceland, namely the beneficial effects of a 5cm or so top dressing from time to time of wind-blown volcanic ash of grains the size of peas. The last such had been about fifteen years previously. What Mount Hekla did from 35 kilometres away we have to do from a shovel one metre away. On the face of it we are not tough enough with our plants!

Lichens and mosses occurred frequently, particularly on lava flows, *Vaccinium uliginosum* and *Arctostaphylos uva-ursi* replaced *Calluna vulgaris* and its allies almost totally, whilst small willows such as *Salix herbacea* and *S. lanata* were common in many areas of otherwise bare ground. *Silene uniflora* (which strongly resembles *S. maritima*) was a very spectacular representative of its genus. Other white flowering plants included *Arenaria norvegica*, several Saxifrages and Crucifers. Our favourite was a pale, creamy coloured bedstraw, *Galium normanii* which particularly seems to enjoy the moraine at the foot of a glacier. We saw only five species of orchids, three of which were familiar; lesser twayblade *Listera cordata*, the frog orchid *Coeloglossum viride* and the coralroot orchid *Corallorhiza trifida*. One had a familiar name, *Dactylorhiza maculata*, but a rather unfamiliar look, although it formed a pretty stand in a patch of primeval birch scrub. The last was perhaps the one seen most often but even then not frequently and was a relative of the butterfly orchids: *Platanthera hyperborea*, known in Iceland as northern green orchid. The leaves were more upright than the ones we are familiar with but otherwise it was similar in appearance and

most attractive. As with the other species, these benefited from being in an open position and therefore easily seen. The coralroot orchid, of which we saw only one solitary specimen in flower, was growing in a piece of almost bare ground with by far the smallest heathers *Calluna vulgaris* I have ever seen underneath it!

Final impressions: Expensive, but worth the visit and very exciting. The hot springs and geothermal areas are particularly fascinating and seeing superb plants growing on volcanic ash-fields exposed to Iceland's elements reminded us just how hardy they are.



Platanthera hyperborea

Edith Clark

Book Reviews

Modern Miniature Daffodils: Species and Hybrids

by James S. Wells

Published by B. T. Batsford Ltd.

170 pages, 105 colour photographs, 6 plates of coloured drawings

Price £25

Narcissus: A Guide to Wild Daffodils

by John W. Blanchard

Published by the Alpine Garden Society

202 pages, 46 colour photographs, 9 distribution maps of the Sections

Price £22

Enthusiasts for the smaller daffodils have been without an up-to-date book covering their enthusiasm for a very long time, but now two have arrived almost simultaneously. It is happy therefore that the two books have different priorities though some overlap was bound to occur.

Modern Miniature Daffodils approaches the subject from the gardener's point of view. That it is written by a North American gardener does not reduce its value at all. Like many gardeners he values species and hybrids equally and seeks out the 'best' plant by using the eminently practical approach to the sections used by the American Daffodil Society. His chapters on outdoor and indoor cultivation are meticulously written and comprehensive with perhaps just slightly too much emphasis on the wide use of fungicides. Useful chapters on hybridising techniques and the control of pests and diseases follow. The largest part of the book describes in detail, section by section, the vast range of species and hybrids which he has grown, and is illustrated copiously with mouth-watering photographs. Be warned, you will not be able to resist them! From his wide experience he is able to make sensible comments on the profoundly difficult problem of naming wild plants in the garden using the Flora Europaea, or Fernandes (1968) scheme as seems appropriate.

In **Narcissus**, John Blanchard has devoted his book to wild daffodils and encourages the reader to study and enjoy them both in the wild and in cultivation. His chapter on cultivation assumes the ability to prepare suitable composts to match the needs of the plant with the conditions offered by the grower. This is undoubtedly the correct approach but is little help to the less experienced grower. Those who have tried a few narcissi and are keen to expand the range grown will find in this chapter a

careful distillation of years of experience which is the hallmark of the entire book. After a short chapter on pests and diseases there follows a chapter on classification which is a lucid introduction to the difficulties surrounding the naming of narcissi and is both readable and memorable, a considerable achievement! The chapter ends with a key to the sections of narcissus.

The rest of the book takes these sections in turn and presents a distribution map and, where appropriate, a key to the species of the section. The photographs are taken largely in the wild. The species descriptions are fascinating, usually including the history of early discovery and naming, a record of more recent re-examinations of the sites, comment on cultivation and the occasional amusing anecdote. A list of typical plant measurements is included, often with protestations concerning its too narrow interpretation. The book closes with a chapter on the wild hybrids and a list of specific names.

Two readable and most useful books on this lovely genus are therefore presented to us, each with its own objective and character. Choose carefully or, if you love narcissi, buy them both.

D.F.M.

Frank Kingdon-Ward – “The Last of the Great Plant Hunters”

by Charles Lyte

Published by John Murray Ltd.

218 pages, 26 black and white plates

Price £16.95

In this book Charles Lyte tells us of the life of that great plant-hunter Frank Kingdon-Ward; the last of a long line of professional plant-hunters who combined botany with exploration, and introduced so many marvellous Himalayan plants from North Burma, Assam, China and Tibet.

Kingdon-Ward was a loner and he was tough, really tough, and undaunted by discomfort and hardship. He had a passionate obsession with the wilderness but was a fine scientist with a sharp penetrating analytical mind. He described journeys through some of the most hostile countries in the world, from the bleak uplands of Tibet with grit-laden gales, to mountain slopes and gorges swept by rain and sleet or blanketed with thick soaking mists. The climate varies from sub-tropical to arctic, the only things common to the whole region being perpetual rain, snakes, wild animals, giant nettles and myriads of blood-sucking insects to contend with. Kingdon-Ward did not train teams of native collectors. He liked to see a plant growing and make accurate field notes which proved invaluable to the plantsman and horticulturalist. He had an eye for a good garden-worthy plant and had confidence in the quality of the plants he discovered.

Rhododendrons were his great joy and he went to all sorts of trouble to collect seed and herbarium specimens. He loved to make up popular names for his discoveries – like ‘Coals of Fire’ (*R. cerasinum*) and ‘Yellow Peril’ (a *R. campylocarpum* variety). His travelling companions marvelled at his stamina and perseverance. After a hard day’s trek when the others collapsed exhausted into camp, he would set off to explore the surrounding area, and on one of these forays he spotted ‘Orange Bill’ (*Rhododendron roylei*). Snow lay everywhere; the valley ahead blocked by avalanches forty, fifty feet deep beyond the outpost of the forest. Half way down the slope in dense scrub he caught a glimpse of orange, vivid among the crimson glory of Rhododendrons.

“It was raining steadily, the task of forcing a way through shoulder high scrub was no light one. There was the bush two hundred yards away. I forced my way through the thicket, a stiff fight, but at last, out of breath, out of temper, torn, soaked to the skin and cold I reached for my goal. It was that dreamed of but scarcely hoped-for, a treasure, a real orange flowered Rhododendron. In that moment of triumph I was almost delirious with pride and joy – ‘Orange Bill’ – the Prince of orange Rhododendrons. I cried aloud for I felt lyrical.”

He returned that October to collect seed and that battle was even more difficult.

Such was the man, Kingdon-Ward’s purpose was to collect seeds of beautiful hardy plants for British gardens, and dried specimens of interesting plants for study – that, as he said, was his profession. To explore unknown mountain ranges, find out something about their history, the distribution of their plants and any other secrets they were willing to reveal – this was his hobby.

His remarkable memory enabled him to remember exactly where a particular plant grew, even after a period of years. A striking example of this is given by the story of *Cypripedium wardii*, which he finally collected from the same spot where eight years previously he had originally found the plant!

Charles Lyte has whetted our appetite. Luckily Kingdon-Ward was a prolific writer, and most of his books are collectors’ items, and much sought after, but well worth the search. The book is a masterly description of Frank Kingdon-Ward, the man, his life, and his collecting. It will be popular with all gardeners who like to know something of where and how many of Kingdon-Ward’s plants were discovered and introduced to our gardens.

J.H.A.M.

A Guide to Rock Gardening

by Richard Bird

Published by Christopher Helm

142 pages, 20 colour plates, 30 line drawings by Duncan Lowe

Price £12.95

Richard Bird's latest publication could well become the rock and alpine garden enthusiast's most useful book of reference when embarking on any new project – be it constructing a rock garden or alpine house, a tufa cliff or a trough – there is in depth advice on all aspects of alpine gardening.

The grower's appetite is whetted in the first chapter on habitats in the wild, and subsequent chapters are filled with detailed and practical information on materials to use, design, composts, propagation, appropriate plants and even pitfalls and pests. Many useful tips may be gleaned from the expert.

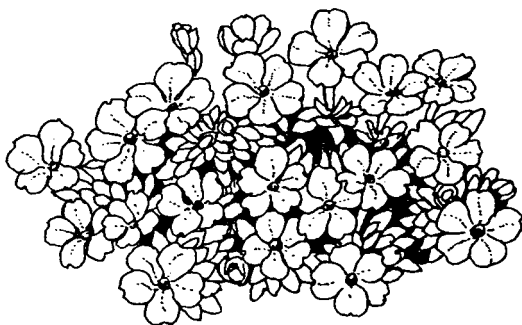
Duncan Lowe's line drawings are superb and complement the text admirably. The colour plates are rather dark, perhaps the fault of the printer rather than the photographer.

A good generic plant list is given with typical requirements of the species including a "recommended for beginners" sign. There is an appendix with lists of plants for specific situations such as peat beds, troughs, waterside and others. A list of plants suitable for the alpine house would have been an appropriate addition but this is a minor criticism of an excellent book.

It is unfortunate that the proof reading of names in the list and elsewhere could be improved; the address of the S.R.G.C. has been printed as Erchiston Park!

A Guide to Rock Gardening is recommended to beginner and enthusiast alike; full of step-by-step advice, useful information and graphic description. A reference manual destined to be well thumbed by its owner.

B.C.



Androsace vandellii

Edith Clark

Discussion Weekend

September, 1990

Queen Margaret College, Corstorphine, Edinburgh

Friday 7 September to Sunday 9 September 1990

Scotland's capital city can perhaps lay claim to be the cradle of rock gardening in the country, and certainly the Royal Botanic Gardens hosts the best collection of rock garden and alpine plants in the country today. A visit to Edinburgh would not be complete without a visit to 'The Botanics' and this year's programme allows time to do just that, guided by RBG staff if you wish.

The excellent lecture programme covers a wide range of subjects from a series of lecturers who have not previously spoken at SRGC discussion weekends, and several of whom are rarely heard on the 'Scottish circuit'. We will cover a wide spread of the globe, from the relatively accessible Greek mountains to the wilds of China and the rarely-visited South American Andes. We will look at a number of aspects of cultivation, from how to cope with new plants, to raised beds and troughs, and will look in detail at that very popular genus of hardy orchids, the pleiones. There will be a chance to exchange dwarf bulbs on Friday evening, and a lecture on an aspect of their cultivation.

Queen Margaret College is situated on the west side of Corstorphine Hill in the west of Edinburgh. It is on Clerwood Terrace off Clermiston Road, which runs between Queensferry Road and St John's Road Corstorphine. It is of easy access for drivers from almost all directions, and there are bus services available from central Edinburgh; details on request.

Accommodation is available from Friday evening to Monday morning, 10th September, in single study bedrooms. **Members requiring vegetarian meals, or with any other special requirements, should make these requests at the time of booking.** All the lectures and the autumn show will be held on the campus site. A list of local hotels and attractions is also available on receipt of an s.a.e.

There will be a number of trade stalls, and a club plant stall and plant auction, for which plants would be greatly appreciated. In addition, books and paintings will be on display and sale. We hope there will be large entries for the autumn plant show and for the holiday photographic competition (details in the Show Schedules). Please support both of these and add to your and everyone's enjoyment of the weekend.

An informal programme of garden visits will be arranged for those staying on until Monday morning.

Programme

Friday

- 8 pm **Greek Mountain Plants in the Wild and in Cultivation**
Dr John Richards, Hexham
- 9.30 pm Dwarf bulb meeting and dwarf bulb exchange

Saturday

- 10.30 am Guided tours of the Royal Botanic Gardens, Edinburgh.
Meet at the West Gate
- 2.30 pm *The William Buchanan Memorial Lecture*
Unnatural Rock Gardening
Duncan Lowe, Lancaster
- 4.15 pm **Plant Hunting in China:**
The Jade Dragon Snow Mountains of Yunnan
Dr Chris Grey-Wilson, Suffolk
- 7.00 pm Reception and dinner at Queen Margaret College
After dinner speaker: Mr Alfred Evans, Edinburgh
- 10 pm Plant Auction

Sunday

- 9.45 am **Pleiones and their Cultivation**
Ian Butterfield, Buckinghamshire
- 11.30 am *The Harold Esslemont Lecture*
The Andes and Patagonia
John Watson, Kent
- 2.30 pm **The Cultivation of New and Rare Plants**
Brian Burrow, Lancaster

Prices

Residents

- Friday evening meal-Sunday afternoon tea £76.00
- Saturday morning coffee-Sunday afternoon tea £59.00
- The above prices include the cost of the Saturday evening banquet.
Members wishing to stay for Sunday evening meal, bed and breakfast
should add £15 to the above prices.

Non-Residents

- Saturday or Sunday morning coffee, lunch, afternoon tea and all lectures
on that day £19.00
- Saturday evening Reception and Banquet £13.00
- Applications for bookings together with the appropriate remittance should
be sent to the Registration Secretary, Mrs Jane Thomson, 88 Liberton Drive,
Edinburgh EH6 6NR. Telephone 031 664 1512.
Please send s.a.e. for acknowledgement of booking. Members wishing
further information should contact Jane at the above address (s.a.e. please).

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Abbreviations- FaM Farrer medal, FM Forrest medal, FCC First Class Certificate, AM Award of Merit, PC Preliminary Commendation. Bold type (eg 25) indicates an illustration number.

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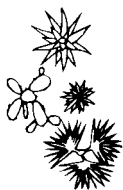
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