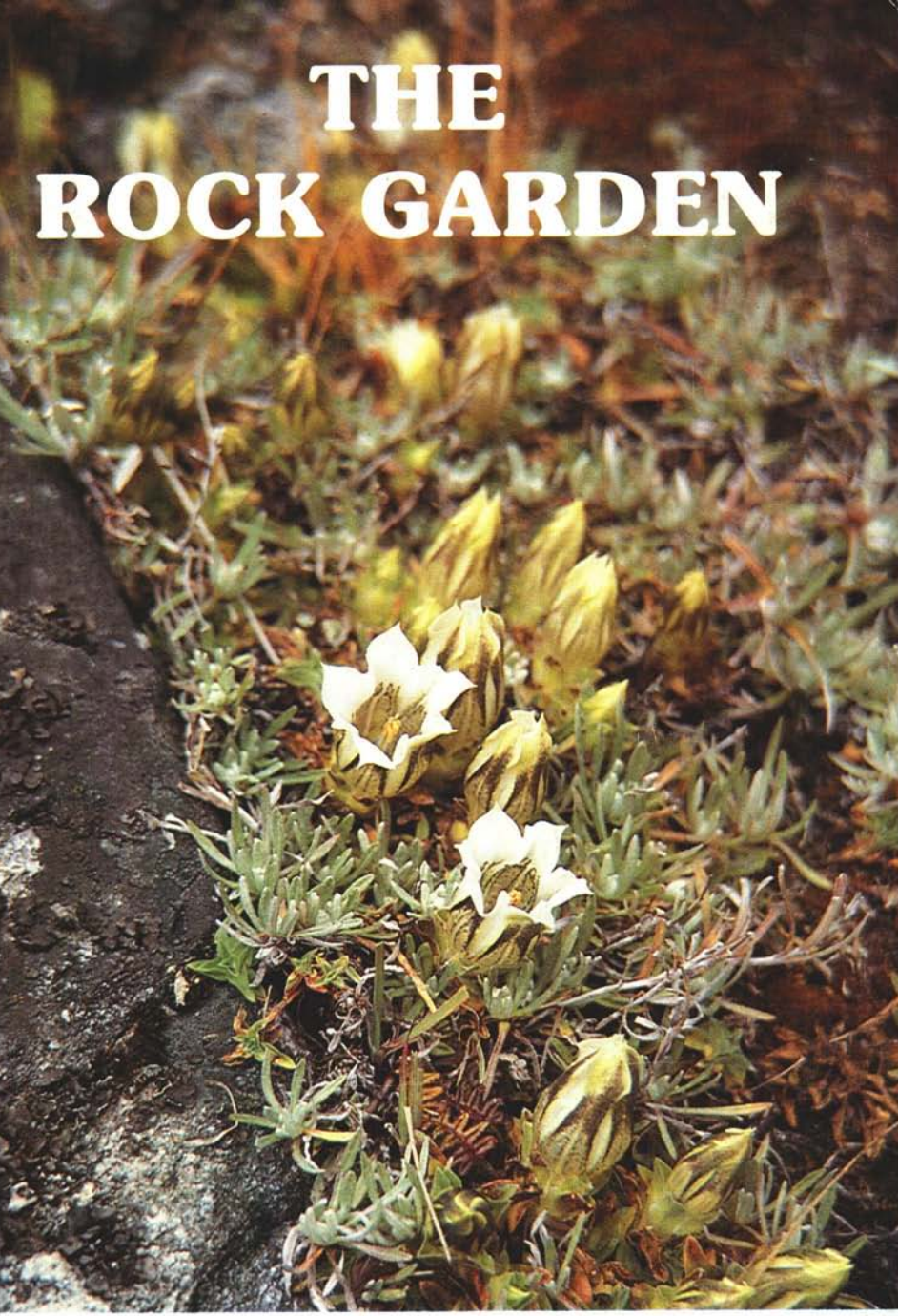
THE ROCK GARDEN



THE JOURNAL OF THE SCOTTISH ROCK GARDEN CLUB

Volume XXV Part 1 Number 98

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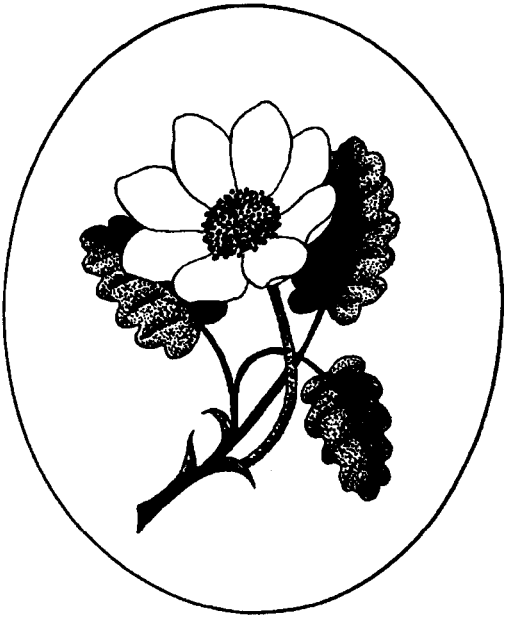

THE JOURNAL OF THE SCOTTISH ROCK GARDEN CLUB

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Front Cover : Gentiana depressa (white form) Gosainkund (p.63)
Photograph: Fred Carrie

THE ROCK GARDEN

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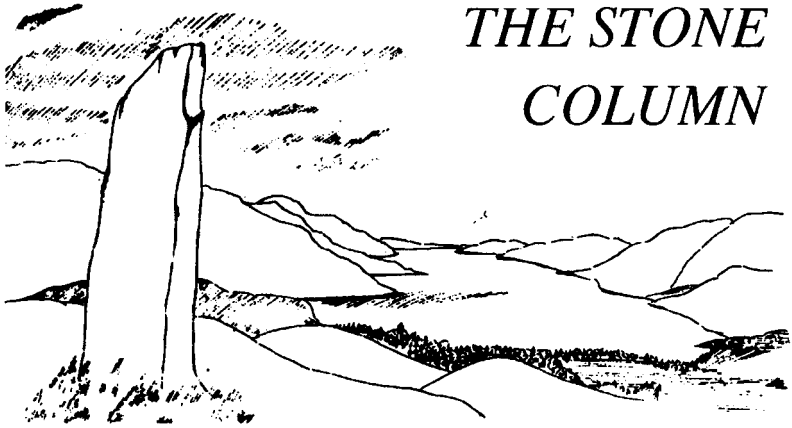


THE STONE COLUMN

THE STONE COLUMN ABROAD:

WITH THE SRGC TO GOTHENBURG, MAY 1995

With the Stone Column approaching its thirtieth edition, perhaps the time has come to break temporarily with tradition and adopt a slightly different format. It was originally proposed to me by Don Stead back in 1981 that I write a regular feature for the then SRGC Journal, a sort of Alpine 'gossip column' with a mixture of diary, comment, and cultural advice firmly based on our own practices here by Loch Ness. While not intended to be a true anthology, contributions and ideas from other members always were, and still are, most welcome. Since it has always been my cardinal rule to write only from first hand experience, it was inevitable that the Askival garden should, over the years, have taken up a major part of the Column. When discussing the future policy recently with Don he suggested that I could perhaps add a little more variety by describing, and commenting on, gardens other than our own. In my own defence, I responded that it follows from the above principle that I could only write about gardens which we have actually seen personally, and it is rare indeed to have spent enough time in another garden to be able to contribute more than just surface impressions. However, with the visit of a small party from the SRGC to the Goteborgs Botaniska Tradgard in Southern Sweden for five days in May 1995 an exceptional opportunity has come about that hopefully proves the rule.

WE REACH GOTHENBURG

Such is the reputation of the Gothenburg BG, especially for alpines and bulbs, that when Jean Wylie asked if we were interested in joining a group visit, we had little hesitation in saying yes, even though it was to be at one of our busiest times. Inevitably the best moment to see another garden is the worst to leave one's own, save it be in a radically different climate, or indeed the opposite hemisphere. So it was early on the morning of May 11th that eleven Scottish Rockers, and one non-gardening spouse who feigns indifference to matters horticultural, gathered by the British Midland desk at Glasgow Airport for the flight to Gothenburg via Copenhagen. The little upright trolleys provided by the Danes for hand luggage were of great help during the transfer. especially as I had our much-travelled airline approved cat-carrier full of plants for Henrik; other airports please note. First impressions of southern Sweden as we drove into Gothenburg city centre on the airport bus were of a landscape not that different from our own – hard rock, surface water, and birchwoods. Once in the urban area, however, it was immediately obvious that we were no longer in the UK. While our public transport decays from lack of investment and cars are allowed to clog up our cities, the Swedes have radically different priorities. Parking is severely restricted and very expensive. Instead residents and visitors alike can use the excellent tram network, a map showing the numbered routes in various colours making the system user friendly. For both people and plants the highly beneficial consequences for air quality within Gothenburg are obvious.

NO BOSSES IN SWEDEN !

Reasonably priced accommodation at a city centre hotel had been arranged for us all by Jimmy Persson, the Assistant Director of the garden, whom we had first met at the 1991 International Conference in Warwick. When Henrik Zetterlund, Horticultural Curator for Alpines and Propagation, introduced us, I remarked, with not a little jealousy, that Henrik was very lucky to have a boss who allowed such interesting trips to the USA., only to be told : "We don't have bosses in Sweden"! When I repeated this to the young lady gardeners in the potting shed at Gothenburg one lunchtime, I was told: "Henrik may not have a boss, but we do". "So why do you obviously enjoy working here?" I responded. "Ah, but Henrik has such lovely blue eyes", was the reply. Gothenburg

BG is clearly a very happy ship. This conversation, like all others we had in Sweden, was conducted in English. Most Swedes of all ages are quite fluent, their skills in a second language putting us to shame. Once we had checked in at the hotel, and found our rooms, it was off to the Botanic Gardens on the tram for the first of many visits. Jimmy met us at the gate, and after a brief introduction on the history and layout of the garden, he gave us a short guided tour of the main cultivated grounds. Once orientated we were then able to explore the whole garden at will for much of the following days, including all the many glasshouses, frames, and nursery areas.

GOTHENBURG AND THE GARDEN

Gothenburg is a old port city on the west coast of Sweden, facing the northern tip of Denmark across the entrance to the Kattegat, which has long had ties with Scotland. Although it is at virtually the same latitude as Inverness, the climate is rather more continental with colder winters and warmer summers when temperatures in excess of 30°C are the norm. One favourable aspect is the usual absence of damaging late frosts; once spring has arrived, it stays. Rainfall is 670mm per annum so irrigation is usually necessary. A semi-automatic system, with permanent sprinklers, is installed in the Rock Garden, while the Bulb garden is is hand-watered by hose in spring and autumn. The Botanic Gardens, which lie to the south of the city centre, are but one of many green spaces within the urban area. Arriving at the tram stop and crossing the main road to reach the quite ordinary redbrick entrance and formal beds beyond, does little to prepare the British visitor for the true nature of the garden as a whole. The site, some 175ha in all, comprises four valleys sloping to the north. It is quite rugged, with bedrock showing on the intervening ridges, glaciated boilerplates of a metamorphic granite or gneiss like that familiar to travellers in the NW Highlands of Scotland. The cultivated ground totals some 16ha but the boundaries are blurred, blending into the surroundings. The valley to the east is a nature reserve, untouched except for the paths, noted for the extensive stands of *Anemone nemorosa* which were in full bloom during our visit. The wood anemone spills over into all the less formal parts; no wonder it has been adopted as the emblem of the garden. Above and to the south lies a semi-wild arboretum, laid out geographically with over 6000 trees of several hundred exotic, i.e. non-native, species. Behind lies open country of lakes and woods, small wonder that wildlife

frequents the garden. We ourselves put up a hare on the east ridge just above the rock garden. In spite of fencing, deer are a problem in winter; snowbanks can provide passage. Even a wandering wolf has been seen in the neighbourhood. Would that it were feasible to reintroduce the wolf into the Highlands; they might even eat some of those wretched woolly tree destroyers.

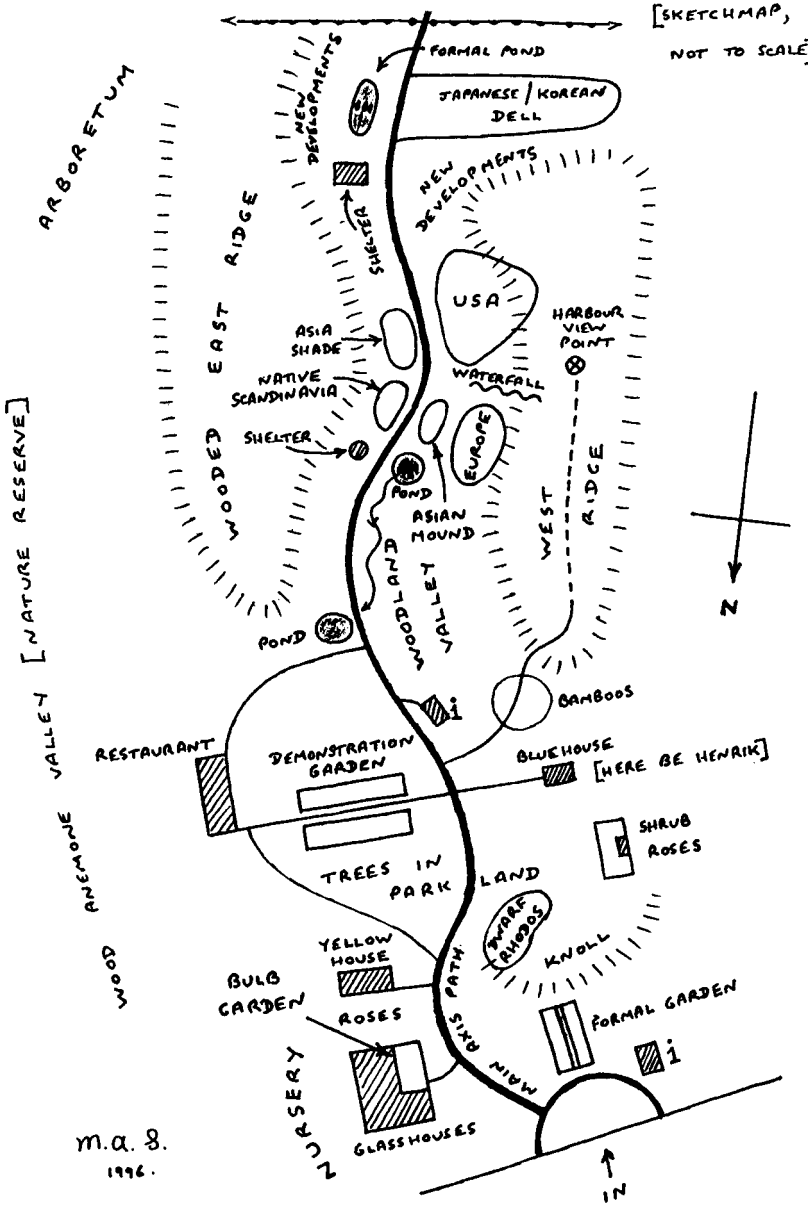
Before proceeding to describe in more detail those parts of the garden of special interest to alpine enthusiasts, we should pay tribute to the contribution of a Norwegian, the late Per Wendelbo who was Director from 1965-8. Although a respected taxonomist and author of a monograph on the genus *Dionysia*, Professor Wendelbo was responsible for a change of emphasis at Gothenburg, from an academic botanic garden intended primarily as a teaching aid, to a horticultural and recreational resource for all.

Owned by the City, entrance is free and the gardens are clearly valued, being visited by many citizens of all ages even on cold days.

RHODODENDRONS

The core of the garden proper is set around a broad asphalt path which winds its way for almost a kilometre up the central valley, gaining some 100m in height from the front gate to the Japanese dell (see sketch-plan p.5). Starting at the front entrance, this path trends leftwards, curving around the first of many knolls. Below on the left lie the glasshouse complex, nursery, and bulb beds, of which more later. On the far, or south side of the knoll, peat terraces contain a collection of dwarf rhododendrons, cassiope, and other Ericaceae, planted as a moorland matrix. As in many American collections, some of the rhododendrons need to be protected by pine-branches during the winter. Beyond, the ground levels, and the path enters what is perhaps the most familiar looking part of the garden, specimen trees set in a parkland of mown grass. Here is also to be found the Demonstration garden, comprising formal herbaceous borders set at right angles to the main path, and, at their far end, the restaurant. These borders, filled with perennials which are commercially available in Sweden, are intended to help the general gardener with choice of plants for local conditions. We were far too early for most of these plantings,

GOTHENBURG BOTANIC GARDEN



but the restaurant provided excellent food, and frequent warming cups of very strong coffee. At this point on our tours we gravitated to the other side of the main axis to enter the woodland garden at the bottom of a steepening valley between the east and west ridges. Naturally larger rhododendrons feature here, but this is not in fact an easy environment for many of the species frequently seen in soft West Highland gardens.

Rh. smirnowii clearly does very well and we noticed healthy young plants of *Rh. bureavii.* There were some very beautiful azaleas here, including the first of many fine specimens of the Japanese *Rh. albrechtii* in rich pink. This species is also a feature of the Japanese Dell, together with the paler *Rh. schlippenbachii* from Korea. We have tried the latter, but the young growth is always damaged by our late frosts and it does not regrow that season. It is said that *Rh. albrechtii* will replace such a loss, so perhaps we should try it instead, to flower before species such as the American *Rh. vaseyi.* Contrasting with the delicacy of the azaleas, solid pillars of the rare *Viburnum furcatum* lit up the woodland with their white lacecaps. Naturally, *Anemone nemorosa* was much in evidence as a ground cover here, making a particularly ethereal effect in the dappled sunshine when associated with *Fritillaria meleagris alba* and the 'ordinary' lavender form of *Primula denticulata.* We much prefer this last to the so-called red forms, which are but a pale shadow of a good rich crimson *P. elatior ssp. meyeri* (syn. *P. amoena*). A stream winds its way down this valley from the Rock Garden above, to end at a large newly constructed pond on the edge of the parkland, not far from the restaurant. Beside one pool by the steep path the broad yellow spathes of *Lysichiton americanum* made a beautiful picture with the overhanging trusses of a white *Rh. pachytrichum.*

THE MAIN ROCK GARDEN

Emerging from the woodland, the slope eases and one enters an amphitheatre containing the main Rock Garden of some 0.6ha. The east ridge to the left is still largely wooded, with a mixture of conifers and some elegant birches fully living up to the name 'Lady of the woods'; whereas the opposite side has been largely cleared to expose the rockface. One very large and several small waterfalls descend this face to feed a series of pools, bogs, and rivulets

meandering around the various artificial mounds on the floor beneath. Eventually these watercourses combine to form the stream down through the woodland valley mentioned above. With the water cascading 20m over boilerplates, the whole scene reminded us of the Californian Sierra on a smaller scale (Fig.1 p.14). I am no fan of so-called natural rock-gardens; importing Westmorland limestone to build a pile in the flatlands of East Anglia, for example, makes no aesthetic sense, quite apart from the conservation implications. However, by using the local stone and matching gravel on both paths and beds, the effect at Gothenburg is of material having fallen and scattered from the crags above. As originally built in the early 1920s, the rockwork was founded on glacial clay imported to this site, but during reconstruction throughout the 1980s much of this has been removed and replaced with a layer of sand on which the rocks were reset. All compost, a loam, peat, and grit mix, used in both construction and subsequent top-dressing is heat-sterilised. As a result, there were almost no weeds; we found only three poppers in the entire rock garden. To my eyes, the effect was a little clinical in places, with almost no self-sowing. This is perhaps inevitable in a large garden where maintenance is a divided responsibility. An owner/gardener can decide while going along, whether to leave any self-sown plants in situ, or weed them out. In a Botanic Garden the source of plantings is of great importance; thus each should remain an entity distinct from its neighbours. Also a self-sown seedling is obviously not of known wild provenance, it could be the result of crossing within the garden. How does one give it an accession number?

THE PLANTING SCHEME

The planting scheme is arranged geographically into four main areas, one of which, Asia, is split by the main axis path. Our recollections of these can be but a snapshot of some mid-May flowers, rather than a 'video' of the many interesting plants throughout the entire season. As we first entered the Rock Garden, our eyes were drawn straight away to a golden beacon of *Adonis vernalis* glistening in the afternoon sun on the Scandinavian area to the left, at the foot of the east ridge. The adonis qualifies as a Swedish native, being found on Gotland and Oland, limestone islands in the Baltic, together with *Pulsatilla vulgaris* ssp. *gotlandica* which was also in flower nearby. Flora Europaea submerges this into *P. v.* ssp. *grandis* but the leaves are greener and

partly developed at flowering time. Further in, 'Scandinavia' takes the form of shallow peat terraces, more in the shade of the trees on the rise behind. Arctic-alpines are said to be difficult to keep through a Gothenburg summer, but both *Diapensia lapponica* and *Cassiope hypnoides* were well established in a NW exposure, while *Pyrola norvegica* and *Cystopteris montana* ran through the peat blocks. Further along this east side, the peat theme continues in the shady half of 'Asia'. Naturally, dwarf rhododendrons are prominent here, but of more specialised interest was their own KGB collection of *Cassiope pectinata* from West China. *Vaccinium praestans* and *Shortia uniflora* are used as ground-covers, the latter much easier at Gothenburg than *S. soldanelloides.* Not all Asian alpines are shade lovers, and on the other half of 'Asia', out in the open across the main path were more beautiful clumps of pulsatillas: two forms of *P. patens* var. *flavescens* from different parts of Central Asia with their open cups of creamy yellow and lacy palmate foliage, contrasting with two of *P. albana* . The foliage dissections of the latter are superimposed on basic pinnate divisions, giving the leaf a longer, narrower overall shape, and the flowers open less widely. One clump was a lovely smokey blue, while the other, *P. albana* var. *lutea,* had rich yellow tepals (Fig.2 p.14). Yet another distinct species of pulsatilla was to be found on the European section behind, the true *Pulsatilla rubra,* not to be confused with the red form of the pasque flower, *P. vulgaris* var. *rubra.* Its hanging flowers of deepest maroon blended beautifully with a dark, almost black, form of *Fritillaria ruthenica* nearby.

NEW WORLD PLANTS

By far the largest single area is that devoted to plants of the New World, starting with a small bog. 'America' fans out into a matrix of low raised woodland beds beside the main path, while to the right, up by the waterfall, lie Henrik's new screes. We spent much time up there admiring old friends which we knew from our own travels in the Rockies. *Clematis tenuiloba* ran gently around, popping up here and there to display hanging lavender flowers on stems of less than 10 cm. As dwarf as the fashionable *C. marmoraria,* and certainly very much hardier, this gives the impression of a more typical clematis in miniature. Buns and mats were there aplenty, several phlox species, and a good selection of eriogonum. When grown under glass, the latter often become lax;

we have seen some travesties on the showbench. Henrik's tight silver mats were quite in character, by far the best we have seen outside their natural habitat. The genus *Balsamorhiza*, while a prominent component of the American alpine flora, is seldom seen in cultivation, being tap-rooted and too large for the alpine house. *B. serrata* from the NW of the Great Basin displayed its yellow sunflowers not far from the low tufts of *Polemonium elegans,* a rare high alpine endemic of the Northern Cascades. While willing to accept Mediterranean roadside weeds into their collections, alpine gardeners generally regard cacti as beyond the pale but there are some true alpine species. Henrik is broad-minded enough to include a representative sample in these new screes, incidentally without the winter cover they would need in Scotland. These scree beds are separated from the uncultivated section of the west ridge beyond by a blockscree rock-slide hiding ground-cover plastic to prevent the encroachment of native running weeds. No selfconsciously aligned fake rock strata here, instead a more typical mountainside scene of jumbled fallen boulders to make us really nostalgic.

WOODLAND 'AMERICA'

Down below in the woodland section of 'America', which closes off the south end of the amphitheatre, it was trillium and erythronium time. Most of the known species of the latter were represented, including a fine patch of the usually temperamental *E. albidum,* its silvery-white blooms perfectly displayed above subtly mottled foliage (Fig.3 p.15). Less subdued perhaps, but equally attractive, were the many plantings of trillium. The vigorous Californian *T. chloropetalum* displayed its large, slightly twisted, upright red flames under a variety of names. Gothenburg are in good company; a recent front cover of The New Plantsman had this labelled *T. sessile*, a common error. We have the true species from Kentucky, a much smaller and horticulturally inferior plant with ovate petals of a slightly brownish purple and more slender, somewhat hanging, mottled leaves. Another Eastern species, grown at Gothenburg, *T. cuneatum,* is very much better. *T. chloropetalum* also comes in greenish-yellow and white forms, the latter sometimes basally marked with pink; both were represented in 'America', not in disguise. Several of the rarer species could also be found thriving here, including the tiny *T. nivale* which is sometimes said to require a limey soil.

THE JAPANESE DELL

The arterial path escapes from the Rock Garden basin between 'Asia-shade' and the woodland part of 'America', to level out above beside a Japanese style pool overhung with *Rh. albrechtii,* opposite yet more patches of *Shortia uniflora* in full flower.Shortly afterwards one reaches the deerfence and the end of the garden proper; beyond lies the arboretum. Poll was very taken with the pool and its surrounds, taking many shots of the combination of symbolic rocks, water and azalea blossoms, enhanced as they were at that moment by low angle sun. At this point it is well worth leaving the main axis and turning right to enter the lightly wooded Japanese Dell. On one's right, the west ridge terminates in a south-facing slope, the lower part of which has been informally terraced and planted. Further fine azaleas are to be found in this section, including the *Rh. schlippenbachii* mentioned above, and a delightful pale-flowered form of *Menziesia ciliicalyx,* its many cream tubular bells delicately flushed with pink on the lobes. Both clearly benefit from the more predictable spring in southern Sweden, as do the more precocious magnolias, flowering freely on bare branches in the Dell. Trees may be planted for attributes other than flowers, of course, two examples here being the young growth of *Acer tschonoskii* var. *rubripes,* and the shining amber bark of *Prunus maackii.* Once again lighting made all the difference. We were quite fortunate with the weather on the whole; cold it may have been, but there was enough sun to keep the photographers happy. Taking the place perhaps of the Tibetan cherry, *P. serrula,* commonly planted for bark in Britain, *P. maackii,* a bird-cherry from Manchuria and Korea, clearly flourishes in the Gothenburg area. We saw other good specimens in private gardens, together with maples such as *Aa. griseum* and *pensylvanicum,* birches, willows, and appropriately the Swedish whitebeam, *Sorbus intermedia.*

ORIGINAL SETTING OF THE GARDEN

Another digression from the main path which is well worth making is the traverse of the west or waterfall ridge, if only for the insight it gives into the natural vegetation of the area and thus the original setting of the garden. Just after the Demonstration Garden

on the left and the path to the Blue House on the right, another turn to the right leads to the bamboo grove. From here a largely unmade path winds its way up the ridge to the harbour viewpoint. One could almost be in the mountains, an impression heightened by the vegetation of heather, bilberry, scrub birch and rowans. The thin soil over the rock clearly cannot support coarse weeds like nettles. At the highest point, beside the pump outlet at the top of the waterfall, which to be frank could be better hidden, there is a choice of routes. The Rock Garden can be re-entered, passing some seats on a sheltered shelf above the new American screes, or one can wander down the boilerplates towards the entrance of the Japanese Dell. New developments were taking place both on this SE corner of the West ridge, an extension of the woodland part of 'America' and at the foot of the east ridge behind the semiformal Japanese pond. This is good to see; no garden can ever stand still, especially an alpine one where there are always introductions and re-introductions to be propagated and tried. There is something of the collector in all of us, no matter how, or on what scale, we choose to display our plants.

GOTHENBURG'S COLLECTIONS

Speaking of collections, we must now return from the heights and look at the glasshouses and other forms of protected cultivation down near the main gate. Remembering Per Wendelbo's long influence and interest in the flora of Iran and Afghanistan, it is hardly surprising that Gothenburg BG should have an international reputation for its cultivation of bulbous plants, in the broad sense. It is sad indeed that he did not live to see the planting of the specialised Bulb Garden that is his memorial. This consists of a series of formal brick-built raised beds, set in a sunken terrace on the SW side of the large glasshouse, (Fig.4 p.16), some of which were capped by tall glass frames at the time of our visit. This had been determined largely by the alpines out in the garden, so naturally many 'petaloid monocots', to borrow Col Grey's expression, such as crocuses, were long over, but we had hit fritillaries at their peak. Gothenburg has a huge collection, both out on these bulb beds, and also grown in pots plunged in a series of low sandbeds set under a large well-ventilated span-roofed glasshouse. I am personally no great fan of 'green and brown frits', preferring the creams, yellows and the stronger self-coloured

purple-browns, but several of our party spent many hours admiring, discussing and photographing their subtle variations (Fig.5 p.16).

Henrik, together with one of the botanists at Gothenburg, Magnus Liden, is working on a book on *Corydalis*, so the genus was very well represented both in this house and outside. Many of the better blue tuberous species indoors were unfortunately somewhat past their best. As these age so they tend to become lanky and flop over the side of their pots. If they will survive outside, then growing them harder in full light will help to counteract this tendency; but many of the species are as yet too rare to be trialled. Other corydalis were to be found in the frameyard outside this house, planted out in wooden-sided frames under overhead lath shading, including the newly described (1971) white-flowered *C. magadanica* from the east coast of Siberia. This is one of several species which should, with any luck, make good garden plants when eventually available. Another of these frames was full of the curious little *Trillium govanianum*, in full flower. This form, originating from the West Himalayas, appears hardier than most; it was introduced by their 1983 Swedish Expedition to Pakistan.

Returning indoors we then viewed the Limestone or Mediterranean House. Intended for public exhibition, this has a permanent backbone of tufa raised to eye level in which plants are established. The display is enhanced in the traditional way by bringing in and plunging potted plants as they reach their best. The tufa itself is liquid-fed, and inevitably this has led to a dark green film of algae and mosses on the rock. I have no objections to this, as it helps to mute the rather stark colour of raw tufa. As many of the residents are from Mediterranean climes, this house is kept frost-free.

ALPINE PROPAGATION

The Alpine House proper demonstrated an interesting mixture of old and new. Cuttings are rooted in the sort of plastic trays with transparent plastic tops one sees in any garden centre, placed on a heated bench. Watching one propagator lining out very neat rows of tiny cuttings in one of these trays, I said she could come and work in our garden anytime. If she had said yes, I should have been in real trouble! Seeds of alpines are sown on small plastic pots and placed outside in a cold frame. Once they germinate, the pot is brought inside and the top-dressing is tipped off. One of the young ladies told me that this was so that she could tell more easily when the pots need watering. Pricking out takes place at a very early

stage using tiny 5cm plastic pots. Only plants destined to be grown on as potted specimens are transferred to clay pots which are plunged in sand, in the manner familiar in 101 alpine houses. No shading was evident during our visit, but thin netting is apparently used later in the year. Further cooling is provided by very powerful electric fans, placed vertically to blow air along the house. This artificial gale was decidedly chilly one evening, so much so that we deserted the alpines for more strong coffee.

LOCAL ALPINE SHOWS

Although most of our time was spent in the Botanic Garden, we did see other aspects of Swedish alpine gardening. On the Saturday morning we attended a local alpine group show in a park near to our hotel. While somewhat sparse by Scottish standards, there was nothing wrong with the quality of the entries, nor the welcome we received. There are two possible explanations which come to mind. Most Swedes grow their alpines outside, especially further inland where snow cover is more reliable. Private alpine houses are almost unknown and frames rare. A second factor could be Scandinavian egalitarian instincts. I must confess again to a certain sympathy with this point of view. While accepting that shows serve valuable educational, publicity, and social functions, I still feel uneasy about an institution which makes a beautiful plant into a source of kudos.

I wonder whether the Swedish Alpine Groups have considered the Czech pattern where a specially built rock garden near the Prague city centre forms the permanent setting. Members bring in their plants which are temporarily set in the rockwork and removed when the show is over

Sunday was spent outside the city, visiting a couple of local gardens, unfortunately in rather inclement weather. The first garden on a steep slope beside and behind the house was almost entirely terraced with peat blocks; not the small rather solid fuel bricks often seen in Scotland but the sort of large fibrous topspit blocks we tried in the early days. Obviously hairmosses are not, in Sweden, the ineradicable problem we find them to be. As at the Botanic Garden, the underlying soil is a heavy clay, and this

Fig. 1 Rock Garden at Gothenberg (p.7) Polly Stone

Fig. 2 *Pulsatilla albana lutea* (p.8) Polly Stone

Fig. 3 *Erythronium albidum* (p.9) Polly Stone

Fig. 4 Bulb Frames and the Alpine House (p.11) Polly Stone

Fig. 5 *Fritillaria gussichae and F. involucrata* (p.12) Polly Stone

Fig. 6 Garden at Inshriach (p.21) John Lawson

together with a flow of moisture down the slope meant that watering is rarely necessary, even on a bed under a large conifer. *Glaucidium palmatum* does very well in this part of Sweden, and a huge clump was in full flower, as was a pristine *Magnolia stellata.* Although it was sleeting, as mentioned above, actual subzero temperatures are rare at that time of year. We were surprised to learn that carved stone Japanese-style lanterns, like the one seen here, were readily available; a Danish entrepreneur is apparently having them handmade in China. A pity British Midland would object to one in our luggage. We did, however, come away with the recipe for 'Mother's favourite' cake. Once more Swedish hospitality had played havoc with our waistlines.

At the second garden the weather was if anything, even worse, but everyone braved it to admire *Daphne arbuscula* and *Corydalis cashmiriana* flourishing side by side on a peatbed on the north side of the house. A more or less level site, the usual heavy soil, and a high water table less than a metre down, make for excellent tree growth, but are hardly ideal conditions for alpines. The solution adopted here was a raised bed of concreting sand, containing particles up to 3mm, fed with bone meal. It certainly appeared to suit *Gentiana acaulis.* This garden had no apparent rear boundary, it just merged into the communal woodland behind; aesthetically pleasing, but leading to problems with marauding deer.

WE ALL COME AWAY WITH TREASURES

Before agreeing to make the trip to Gothenburg, Poll had expressed her reservations on two counts. May, when our weather can be so fickle, is a tricky time to leave the garden and would there be enough to see to justify five days away? Her fears were indeed realised on the former: frost and hail did do damage at Askival while we were away, but really there was little we could have done had we been at home. On the second point, however, there was absolutely no need to worry.

Monday morning, our last day in Sweden, found us once again in the Botanic Gardens. As we sought out our favourite spots to say farewell to the Garden, Henrik raced around gathering up plants so that everyone could come away with a box of treasures. Green and blue have always been my favourite colours; I should have had great difficulty choosing which chariot team to support in Byzantium. Green there was of course a plenty, but also some beautiful blues. Up in the Rock Garden a group of *Mertensia*

coventryana provided a striking accent at the north end of the Asian Mound. A low tufted plant, close to *M. moltkioides,* the heads of large forget-me-nots had broad spreading lobes of an intense royal blue, not at all like the plate in 'Clay'. Like many plants of the Western Himalayas, it is tougher than species from further East. Equally outstanding, pulling the eye from afar, was a patch of *Bellevalia forniculata* on one of the unprotected bulb beds. New to me, this grape hyacinth from NE Anatolia has flowers of a more brilliant turquoise blue than any muscari I have ever seen. It was great to see such superb plants out of doors, stretching and looking at the sky. No matter how beautiful, or well-grown the individual plants, no show or collection of pots can have a fraction of the overall aesthetic appeal possible in a garden. A set of cameo roles by big Stars does not necessarily make for a great film, there's the small matter of the script, and at Gothenburg they have some great writers.

WE'LL BE BACK

There was no putting it off any longer, we had to tear ourselves away. Everyone resolved to return, the bulb-growers earlier to see crocus and narcissus, Poll and I a little later, to see the Rock Garden at the beginning of June. It is impossible to thank adequately all at Goteborgs Botaniska Tradgard, for their generosity to the SRGC party, with their time, their unique space, and their gifts of such marvellous plants. We should also like to express our thanks publicly to Jean for organising the logistics of the trip. As independent travellers, we know what is involved. She did, however, nearly lose all her 'brownie points' at the last minute, when she led us to the bus station by the scenic route, and had us carrying our luggage across a canal lockgate. I made sure I had a really secure hold on that cat-carrier.

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INSHRIACH NURSERY

A glimpse of how this famous nursery was developed on a small Speyside estate

by John Christie Lawson

The story of Jack Drake's alpine plant nursery at Inshriach may be said to begin 57 years ago at a bookstall at Broad Street Railway Station in the City of London. The chance purchase there of a weekly magazine led Jack Drake's father to buy the small Speyside estate on which the nursery now stands – a property which had long been admired and, indeed, coveted, as a sort of unrealised family joke during family holidays in the district.

It has an idyllic situation. Part of what was once a larger estate which was planted up by the Forestry Commission, it lies about four miles from Aviemore in Inverness-shire on the back road which runs from Inverdruie through Insh to Kingussie on the south side of the River Spey.

JACK DRAKE'S AMBITION

Jack Drake had first intended to make a career in the City but found that his heart was not in it. His love was for gardens and mountains so that, when in a fortuitous conversation, a friend asked him why he did not combine these interests and change over to alpine gardening he knew at once what he must do.

He went to Ingwersen's for about 18 months to learn the trade and was at the stage of looking for a suitable place to start his own nursery when the family made their move from Hertfordshire to Speyside.

He had at first no thoughts of a Nursery in Inverness-shire but a glade among the birches at Inshriach suggested a perfect site and, by degrees, the idea began to seem a possibility. Potential customers might be far away but they could be reached by the main railway line to the south from Aviemore and the post van came to the door.

And so, in 1938, the nursery was begun. A potting shed, two small alpine houses and some frames were built but unfortunately the war

came along and Jack departed to the Army. The plants were dispersed and the nursery ground left to return to the wild.

Demobilised in the autumn of 1945, Jack went to work to rebuild his enterprise. His help to begin with was one girl and two German prisoners of war. The buildings were put in order and the rock garden in the middle of the nursery was laid out with great stones manhandled from the hillside. As the business progressed more plunge beds were built and paths laid (Fig.6 p.17: Fig.7 p.34). It was a time of great difficulty for restocking but petrol coupons were obtained somehow and Jack set out on a grand tour of Britain begging plants wherever he could. The load with which he returned enabled him to set up shop again.

It soon became necessary to look round for more help and in the spring of 1949 I came to work for Jack; together with extra summer staff we developed and enlarged the nursery.

Our emblem which was first used on the 1954 Autumn Supplement was an original pen and ink drawing of *Primula reidii* by Admiral Paul Furse, the well-known botanist and artist

THE BUSINESS INCREASES

Two cottages were built in 1950 to house the nursery staff. Business increased and visitors came in ever-increasing numbers and in 1955 I became a partner with Jack.

In the summer of 1956 the main building in the middle of the nursery was built; it was primarily a house for Jack but into the plan was incorporated office accomodation, a packing shed and a flat for summer workers.

As the years progressed, more plunge beds were built and areas cleared for expansion. Electricity did not come to Inshriach until the end of 1962 but in 1963 a new propagation house was built and a soil-warming cable installed.

Visitors increased even more with the opening of the Aviemore Centre in 1966 and it was necessary in 1970 to re-design the sales area together with a show house and new potting shed.

JACK DRAKE LEAVES BUT FAMOUS PEOPLE ARRIVE

Jack retired from the business in early 1971 and I became the sole proprietor. During the next 17 years Jack spent his time looking after the garden, the alpine house and many of the stock plants. He finally left Inshriach in the autumn of 1988 and now lives in Somerset.

Over the years we have had many assistants who have stayed for the summer months and some even for a few years, the most notable being **Joy Larkom** who had a career in horticultural journalism, **Magnus Ramsay** who is now Head Gardener at Threave, **Brian Mathew** the well-known botanist and writer, **John Warwick** who was a partner for a year, **Ron McBeath** (with us for five years) and **Ross Kirby** both now Assistant Curators at Edinburgh Botanic Garden. **Michael Oates** spent a summer here and is now a Botanic Garden Curator in New Zealand, **Jim Archibald** spent two summers here while at University and is now mainly involved in collecting seed world-wide and, last but not least, **Jim Jermyn** and **Kim Davis** who are now running their own nurseries.

Since 1959 we have had three full-time gardeners who have had 59 years service between them, one of them retiring after 34 years. At present I have Richard Austin who manages the growing side of the business and who has been with us for six years.

WE BUILD UP THE MECONOPSIS

When Jack started he acquired seed from many sources. The Rentons at Branklyn, Perth were very generous and, in particular, they gave him seed of *Meconopsis grandis* GS600 in 1938. A large number of plants were raised and planted out but most were lost during the war and only about six survived. After the war these plants were propagated by division and also raised from seed but we found that many of the seedlings were poor forms and so about a dozen of the best were selected and propagated vegetatively, eventually being offered for sale.

In the mid fifties, Sir Eric Savill ordered six plants of *Meconopsis grandis* GS600 which then grew very well at Windsor. He had put up a plant for an award on several occasions; in 1962 he finally received an Award of Merit from the RHS and the following year a First Class Certificate. Having received recognition it had to have a clonal name and on the advice of Harold Fletcher it was named *Meconopsis grandis* GS600 Branklyn.

NEW GENTIANS

Over the years a number of new plants have been raised at Inshriach.

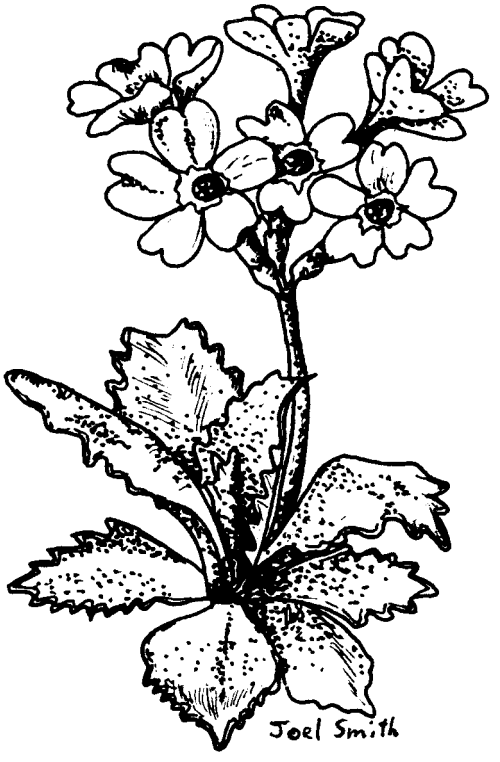
One of the first, and very popular, was *Gentiana* 'Drakes Strain' which arose from seed collected from *G.* 'Farorna', a hybrid between *G. farreri* and *G. ornata.* Although the seedlings vary, most of them have short tubby bells of pale Cambridge Blue. Other gentians include *G.* 'Susan Jane', an Inverleith seedling named after my younger daughter which has almost bell-shaped trumpets and is a striking greeny-blue.

G. x *hexa-farreri* produced two good seedlings, *G.* 'Alpha' with mid-blue flowers and *G.* 'Omega' similar in colour but with a wide open striped flower. *G.* 'Inshriach Hybrids' is a strain we developed from seed of 'Kingfisher' which was itself a seedling of *G. x macaulayi* not unlike *G. sino-ornata* but earlier to flower. More recently we have raised 'Blue Heaven' (a very strong grower), 'Blue Flame' and 'Dusk' both 'Inverleith' seedlings as well as 'Darkness' which is a *G. veitchiorum* hybrid with very dark blue flowers.

AND NEW PRIMULAS

During the early 50s *Primula* x *pubescens* and *P. auricula* were popular plants and many seedlings were raised. It was about the time when the Radio Programme Mrs Dale's Diary was listened to in the potting shed and seedlings were named after the characters. One was 'Mrs Freeman' and another 'Marlene'. It is difficult to say if these plants are still in cultivation but one which is still being grown and is being offered by one or two nurserymen is *P.* x *pubescens* 'Christine' named after my wife. It is a very good free-flowering carmine-pink and was awarded an AM in 1960. 'Blue Wave' was another seedling raised at that time but is now no longer, I am afraid, in cultivation.

Another excellent primula raised at Inshriach is *P.* 'Dianne', a seedling from *P.* x *forsteri* with deep blue-purple flowers named after my elder daughter and awarded a PC in 1960 by the RHS. 'Dianne Hybrids' listed in the catalogue are seedlings from 'Dianne'.



P. marginata is a very satisfactory plant to grow and a number of forms have been raised from the wild. *P. marginata* 'Drakes Form', an interesting form with distinctive leaves edged with farina was a wild-collected plant from the Maritime Alps. Other hybrids were 'Inshriach Form', 'Highland Twilight' (very neat), 'Night Light' (very neat with dark lilac flowers) and 'Joan Hughes' (raised from Linda Pope x *P. allionii*) an excellent primula with deep magenta-pink flowers over rather soft green leaves (awarded an AM in 1967). Joan Hughes was a cousin of Jack Drake who helped in the office in the early years.

The candelabra primulas hybridise readily and when species such as *P. bulleyana, burmanica* and *beesiana* are all planted in close proximity, the bees make sure that the pollen is well distributed, the result being a colourful strain of candelabra primula now known as 'Inshriach Hybrids'.

A number of other primulas in the section Proliferae have been raised here such as 'Bonfire', 'Red Sunset' and, the latest, 'Jackeroo' which is not unlike 'Inverewe' but is a much stronger grower. All these plants are *P. cockburniana* hybrids and are varying shades of copper-red.

In the early 60s seed of *P. sieboldii* was acquired from Japan, producing a number of colour forms which were extremely attractive. Three were named in our 1968 Spring Catalogue – 'Madame Butterfly', a very good white with a purple back to the

petals; 'Rosdew', an excellent pink named after Mrs Drake (Jacks mother) and 'Blue Form', an interesting blue-lilac.

P. denticulata germinates easily from seed and is rather dull in its lilac form so that it is always a challenge to raise a better colour. In a batch of this species we found a very good carmine pink which was named 'Inshriach Carmine'. Although it is not in our present catalogue we usually have a few available.

ALPINE PHLOXES

1960 was an extremely good year for seed and a number of alpine phloxes produced seed which gave 100% germination the next spring. After reaching flowering size, a few seedlings were selected and grown on in a trial bed. We picked out two which were worth naming; 'Iceberg', a good ice-blue with well-shaped round flowers and 'Rose Cushion', a good rose pink on a very neat hummock. Later in the 1960s we raised a further batch of seedlings; a plant similar to 'Violet Queen' was named 'Apollo' after the American space shot and 'Concorde' with neat round lilac flowers and a distinctive eye was named after the aircraft of the same name.

In the late 60s we raised another batch of phlox seedlings which appeared to have 'Temiscaming' blood in their make-up. We named two; 'Crackerjack' (Fig.8 p.34), an excellent deep carmine-pink star-shaped flower and a very compact plant, and 'Red Admiral' with a much rounder flower, deeper in colour and not quite so compact. Both these plants became popular and are now in many catalogues. 'Waterloo' named after the pop song of the name by Abba and introduced in the 70s is deep crimson-pink with a darker eye.

AND MANY MORE GENERA

Penstemons are prolific seed setters and in the early 70s we received seed of *Penstemon rupicola* hybrids and raised two outstanding plants; 'Pink Dragon' and 'Mauve Hybrid' both very colourful plants flowering in mid-summer. 'Purple Gem' a cross between *P. menziesii* and *P. rupicola* has proved to be much hardier than its parents and withstands the winter better than the taller forms.

Two martagon lilies raised at Inshriach have been very successful, easy to grow and showy. They are *L. martagon* 'Inshriach Rose', a good rich colour and 'Inshriach Ivory' a fine white form.

One of the best known plants raised here is *Dianthus* 'Inshriach 'Dazzler' described in this Journal in June 1995. The seed parent was *D. neglectus* and it is a neat plant with buff-backed carmine-pink flowers and easily raised from cuttings

In the early 50s we received seed of *Erigeron aureus* from Mrs Birdie Padavich, a friend in the USA. One seedling turned out to have a pale yellow flower. It was grown on and in 1959 was awarded a PC as *E. aureus* 'Montana' (See SRGC Journal 1960, Vol7, p79). The name was then changed to 'Canary Bird', a well known plant recently mass-marketed. Propagated by cuttings taken in summer it is very hardy but grows best in a trough rather than the open rock garden.

Geranium sangineum is a satisfying plant to raise from seed as it germinates so well. In 1967 we sent two selections to the RHS; 'Jubilee Pink' which received a FCC and 'Shepherds Warning' which was Highly Commended. Both plants are still in cultivtion although 'Shepherds Warning' is the better known plant.

We are surrounded by heather so it is not surprising that during sorties in to the hills Jack found two white heathers; Calluna 'Drum-ra' (AM 1961) named after the area where it was found and 'White Mite', a very neat plant with short spikes of white flowers.

LEWISIAS

One of our main interests has been lewisias. We have raised many thousands over the years. In 1954 an orange-scarlet seedling was selected and given the name 'Comet'; although it had a small flower it was an intense colour. About the same time another seedling was selected with a large pure gold flower which we named 'Golden West'. These two plants were the beginning of our famous 'Sunset Strain'. In order to increase the size of the flower in the strain we have introduced a large-flowered form of *L. heckneri* which has enabled us to produce self-coloured flowers as opposed to the rather stripy flowers of the earlier hybrids.

More recently we have raised an orange-yellow and a rose-purple which we have named 'Sundance' and 'John's Special' respectively.

SERENDIPITY

Over the years we have had a few chance seedlings which have appeared in the nursery. Four which we considered worth naming were *Astilbe* 'Inshriach Pink', *Prunella* 'Inshriach Ruby', *Dianthus* 'Inshriach Startler', *Potentilla fruticosa* 'White Rain' and *P. f.* 'Pink Glow'.

We have also been instrumental in introducing a number of new plants to commerce raised by other people. No doubt some of you will remember Willie Buchanan who was a very keen member of the Club and a great plantsman who had a garden in Bearsden. In the 50s he raised three *Daboecia* seedlings, No.1, No.2 and No.3. No.1 was named 'William Buchanan', No.2 was consigned to the compost heap and No.3 was eventually named 'Jack Drake'. Willie also raised an *Astilbe* and this was named 'Willie Buchanan'. It is a very neat plant with pale pink flowers belonging to the Simplicifolia Group.

Calluna vulgaris 'Ronas Hill' and *Silene acaulis* 'Frances' were found on Shetland by John Copland. The *Silene* was named after his wife.

Potentilla fruticosa 'Grace Darling' is another plant we introduced to commerce. It was a chance seedling in a friend's garden in Northumberland. An attractive plant with salmon-pink flowers, it has recently been promoted by a group of Scottish Nurserymen.

GEMS FROM THE EXPEDITIONS

From the beginning, subscribing to expeditions has been our wont and in many cases we have been lucky enough to be gifted seed. The **Ludlow** and **Sherriff** expedition to Bhutan in 1949 was a case in point. We raised a number of exciting primulas including *P. umbratilis,* P. *dryadifolia, P. kingii, P. valentiniana, P. strumosa* and many others. Meconopsis included *M. simplicifolia, M. discigera, M.sherriffii, M. horridula* and *M. paniculata.*

The mythical *Bryocarpum himalaicum* was also raised and flowered with its omphalogramma-like yellow blooms. *Thalictrum chelidonii* is still in cultivation from that expedition and, of course, the two incarvilleas, *I. mairei* 'Nyoto Sama' and *I. mairei* 'Frank Ludlow'. From an earlier expedition of Ludlow and Sherriff we still have *Cassiope selaginoides* LS 13284 with large white flowers.

In 1952, **Polunin, Stainton** and **Williams** (PSW) went to Nepal and sent back many interesting plants. One of these was *Primula reidii williamsii* PSW 3535 which is still in cultivation in spite of being a short-lived plant. We also raised the same plant collected by Sykes, Stainton and Williams (SSW) in 1954 under the numbers SSW 4675 and 7941. During the same expedition *Parochetus communis* SSW 4647 was collected from 4000m and has proved to be very hardy.

Mrs Ruth Tweedie from Dirleton in East Lothian, Scotland who had a property in Argentina made a number of expeditions to Patagonia during the late 50s and early 60s. She collected many interesting plants including *Calceolaria darwinii, Oxalis laciniata, Symphyostemon lyckholmii* (with a lovely scent), *Anarthrophyllum desideratum* (a red flowered gorse) and *Pernettya mucronata* T173. From a batch of seedlings of this last, well known, species one stood out from the rest which was propagated and named 'Stag River' after Mrs Tweedie's property in the Argentine. We still catalogue this plant.

JACK GOES TO NEW ZEALAND

Jack visited New Zealand for a month in 1970/71, the year he retired from the nursery. He sent a number of plants home, one of which, *Raoulii loganii,* is still doing well and we are able to propagate a number for sale each year. During his visit to the Gertrude Saddle area, Jack came across large silver-leaved celmisias. Like all plant collectors, he carried a stock of polythene bags and fortunately there was still seed on the plants so he filled three bags and sent them home – that was the origin of our *Celmisia* 'Inshriach Hybrids' (Fig.9 p.35). The seed germinates better than any other celmisia we have in the nursery.

Finally, as many of you know, as you get older so things become much harder and you are not able to do the tasks necessary to keep on top of things.

Having spent most of my working life at Inshriach I would hope that when I retire, this lovely place which has given so much pleasure to so many people will continue to exist.

HELLEBORE SEED

A note in the last issue drew attention to irritation caused by handling hellebore seed and asked for anyone who had experienced the problem to contact the Editor.

The response has been surprisingly good; I say surprisingly because not many readers bother to write to the Editor on any matter at all, so that the interest in hellebore seed was a surprise. As you would expect, almost everyone who wrote had experienced some degree of discomfort. If not, you wouldn't bother to write I suppose.

The general response was a loss of feeling in the finger tips on handling green capsules of hellebores, a feeling which in some cases lasted for several weeks. This was often accompanied by skin peeling under the finger nails. Some people experienced these sensations even when just handling the seed, without touching the capsules. A good scrub after handling the capsules was recommended to alleviate the symptoms or simply wear gloves.

I am particularly indebted to Phil McLewin of Phedar Nursery who pointed out that Brian Mathew dealt with this topic in his book 'Hellebores' (Alpine Garden Society 1989, pp.18-20). Brian drew attention to the fact that hellebores have been known for centuries to be poisonous to animals and to humans, the active chemicals being glycosides and alkaloids. Deaths in animals are common so that cut leaves and stems should not be left where animals can have access.

Irritation from handling hellebores has also been known for a long time. A correspondent in the *Gardeners Chronicle* (1872) complained of sore hands after handling large numbers of *Helleborus foetidus* plants. More recently, Will Ingwersen in the AGS Bulletin 2,182, (1934), split open green capsules of *H. corsicus* (syn.*argutifolius*) while collecting in Corsica and "became aware of an unpleasant feeling, akin to a violent nettle sting, in the tips of our fingers, and several hours afterwards our fingertips were a mass of huge, very painful blisters------ one of my friends had to wear gloves for several days and found great difficulty in using his fingers at all."

One or two correspondents had found that dry capsules were not an irritant and recommended putting capsules into paper bags to allow the seeds to fall out naturally. Others, however, found that even handling seeds caused problems. Just being in the same room as hellebores did not cause irritation as happens with some plants such as primulas.

One person claimed that rubbing affected fingers with leaves of *Veratrum album* or *V. nigrum* healed fingers in four days but I would advise a word of caution here as veratrums are known to be quite poisonous in their own right.

Since it is best to sow hellebore seed while they are still green, it is therefore necessary to handle green capsules. The message would seem to be to use gloves when handling the seeds and capsules. Not everybody is affected but the effects are quite nasty if you are sensitive and not to be treated lightly.

BULB GROWING

How to have bulbs in flower all the year round

by IAN and MARGARET YOUNG

The growing of bulbs is becoming increasingly popular among our members and there have never been more bulbs available, both from specialist suppliers and the Seed Lists. You can have bulbs in flower throughout the year if you wish. This article will concentrate on growing Mediterranean-climate bulbs in pots.

It is always interesting to know the conditions in which bulbs grow in the wild, but one should not try to imitate these absolutely. Take, for example, the American fritillaries which grow in a thick adobe clay; attempts to replicate this in a pot lead to disaster. It is best to accept that it is a very unnatural and artificial form of growing plants that we practise and that composts far removed from those of the bulbs' natural habitat are often best in cultivation. It is important to understand the climate, in particular the rainfall pattern, of their native habitat. In our case here, winter wet, summer dry = Mediterranean climate. This pattern also applies to most of the North American frits and to many of the South American bulbs finding their way into our collections.

TYPE OF POT.

We use both clay and plastic pots, with a preference for clay for mature bulbs and plastic for seedling bulbs, The clay pots are plunged as deep as our plunge allows (ca 15cm), while the plastic ones are set on a bed of sand. We like to use deep pots (long toms) for colchicums, the bulbocodium narcissus and some frits e.g. *Fritillaria liliacea*; normal pots for other frits and narcissus; half pots for crocus. This is a guide and should not be taken as a rule. It is probably more to do with our taste and aesthetics than the needs of the bulbs. As our collection has grown we have had to grow some mature bulbs in plastic pots, often with better results, so experimentation is to be encouraged - remember, rules are for breaking.

PLUNGE

In a perfect world the plunge bed should be 30cm or more deep, so that all pots could be plunged to their neck and still have about 15cm below them. However, in reality this is not always possible. Our bulb house is a basic aluminium-framed 1800 x 2400mm (6 x 8ft) greenhouse. The upper plunge is 15cm deep and receives good light; surplus water can drain away at the corners of the structure, while the lower plunge is as deep as required but receives poor light. To maximise space and accommodate our bulb collection, we have to compromise. Our plunge material is a mixed sand, 2mm down to dust, so it is both free draining to prevent the pots becoming water-logged and yet retains sufficient moisture to prevent them drying out too rapidly and help even out sudden temperature fluctuations. It is a good idea to arrange the plunge to keep frits in one area and narcissus in another to make their different watering requirements easier to achieve. To help prevent roots coming out of the pots and spreading through the plunge sand - a real bugbear at showing time – we place a small piece of slate directly under the drainage holes which helps a bit.

HEATING CABLE

As an insurance against prolonged periods of severe frost, we have installed, at the bottom of the plunges, a soil-warming cable. This is controlled by a thermostat with a remote sensor which is buried 2cm deep in the sand of the plunge. The control is set so that the cable only activates when the temperature 2cm deep in the sand reaches 0°C. In the wild most of the bulbs would be at a considerable depth and would not have to suffer freezing through and in fact would die if this were to happen. It is important when growing in this artificial environment to remember that frost can penetrate the pots from all sides and below, as well as above, thus the need for the warming cable. It rarely activates, even when the surface of the plunge is frozen and even when it does come on, it does not raise the air temperature in the bulbhouse but it does stop the bulbs and their roots from freezing solid.

COMPOST

The growing medium, or compost as we call it, for bulbs should always be very free draining. While success can be had using soil-less composts we have found best results from what is basically a John Innes type of mix.

Our formula is-; two parts riddled, rotted-down TURF, one part PEAT, one and a half parts sharp SAND; to this we add a resin-based slow-release fertiliser at a rate of 5g/litre.

The TURF we use is from our own stack of redundant lawn, lifted to make way for new planting areas. There is always a good amount of soil attached when we lift it, ca 7cm average. It has usually rotted enough after one year to be used and we rub it through a lcm riddle to produce a fibrous sandy soil.

The PEAT used, also riddled to remove any lumps, is just standard Garden Centre sphagnum peat which could easily be substituted with leaf mould or garden compost when available.

The SAND is a very sharp 1mm washed silica sand (graded and bagged for specialised sand blasting: for blasting the sand must be kept dry and we are lucky to have a friend who lets us have any that has got wet in storage). Most bulbs seem to enjoy sand rather than the usual grit used in alpine composts; they seem to make a better root system. We have used grit when the silica sand was not available but we added builder's sharp sand or some fine chicken grit to the mix with good results.

This formula is our basic compost for all plants grown in pots and is used for all the bulbs further discussed in this article. The compost is freshly mixed and should be just moist as you repot your bulbs. By "moist" we mean enough moisture to darken the compost and feel cool to the touch but not enough to be able to squeeze water out. If the compost is too dry you will not get the required exchange of moisture between pot and plunge. If you are not sure if the drainage rate of your compost mix is correct, take a small sample while mixing it, put it in a pot and water it. Wait a few moments for it to settle and drain then water it again. If the mix is good, the water will drain freely and quickly. If it does not, more sharp sand or grit should be added until the test is satisfactory.

SEASONAL CARE

REPOTTING (July)

We will start our tour of the season in July, when we do most of our repotting. The procedure is the same if you have just acquired some new bulbs during their summer dormancy. Repotting is carried out every year with all our bulbs. We have tried comparing bulbs repotted every second year, as is often recommended, with those done annually and in every case we have found repotting every year is best. If you don't have the time, your bulbs will grow and flower if repotted only every second year, but better flowering and a greater increase in bulbs is well worth the effort of an annual move into fresh compost. The argument that bulbs do not flower so well the year after repotting is often made by 'bi-annual potters' as evidence that the disturbance of being tipped out and repotted upsets the bulb. If you repot when the bulb is dormant it has no way of knowing it has been disturbed. The reason for this poor flowering the season after repotting in a two year sequence is that the bulbs were in old compost low in nutrients the previous season when the flower buds should have been initiated.

We can never decide whether it is more exciting when a pot of bulbs is in full flower, or when we turn it out to repot and discover how big they are and how many we have this year. There are always the disappointments when there is just a husk or rotting remains; usually these are the ghosts of the rarest, most beautiful, or perhaps the most expensive bulbs.

When turned out, carefully remove the bulbs from the compost, which should, by now, be dry. Shake the spent compost in a shallow tray, as if panning for gold, when any small bulbs which may have been missed, will rise to the surface. After this, consign the old compost to the compost heap for recycling for garden use. Clean the bulbs of old roots and any dead material and split into single bulbs, if they're willing. Dust them with sulphur if there is any sign of rot on the bulbs.

We repot bulbs immediately, pot by pot, and do not like storing them till all are de-potted; there are too many chances for mixing bulbs up and losing labels that way. All our mature bulbs are returned to a pot of the same size, reducing the number of bulbs replaced only if necessary.

Fig. 7 Wall at Inshriach (p.21) John Lawson

Fig. 8 *Phlox* 'Crackerjack' at Inshriach (p.25) John Lawson

Fig. 9 *Celmisia* 'Inshriach Hybrids' (p.28) John Lawson

Fig. 10 *Narcissus watieri* bulbs in pots (p.43) J I Young

Fig. 11 *Narcissus watieri* in flower (p.36) J I Young

Fig. 12 Bulb House in April (p.43) J I Young

Fig. 13 *Crocus scardicus* (p.43) J I Young

Place a single crock or perforated zinc or plastic retainer over the drainage hole(s) in the bottom of the pot (not necessary in plastic pots). No other crocking is required; all the drainage should be in the compost, the crock is simply to prevent the compost pouring out the holes. (Remember the drainage test).

Fill your pot to about 1/3 depth, no more, this is where the bulb will sit. We like to add a very thin layer of silica sand at this stage on which we place the bulbs. Then we cover by further adding silica sand until we can just see the top of the bulb.

Bulbs seem to enjoy the close company of their fellows and you can grow as many bulbs in a pot as can be physically accommodated; shoulder to shoulder is our preference.

The sand layer is not essential; the described compost can be used instead and we do vary between the two options. The silica sand serves to provide a very well drained area around the bulb, of course, but is also most useful in assisting to isolate the bulbs at repotting, when, if you tip out carefully, the compost on top of the sand falls out, leaving the bulbs exposed and easier to separate.

Then add more compost, leaving 3-4cm to accommodate the final layer of gravel. If you want to show your bulbs, it is a good idea to add only 1-2cm of gravel at this stage, as the gravel and pot rim gets scruffy with moss and deposits in the winter months and you can top off the pot with a good layer of fresh gravel just before the show for a smarter finish. The procedure for potting is much the same if you have acquired some frit rice or crocus cormlets.

We use square plastic pots for these, mostly because of space problems. Half-fill the pots with compost, next the sand layer, then scatter in the rice Don't worry about which way up it falls with first or second year rice; it will sort itself out and it can be sown very thickly if you wish. Top off with sand, compost and gravel, as before.

If you want to sow some of your own rice with the parent bulb, plant the parent as described, then scatter the rice on the sand so it is just above the top of the bigger bulbs, Crocus cormlets can be treated in the same way as the frit rice but narcissus offsets are best planted at the same depth as the parent.

Bulb seed is sown in the same compost as described, covered with gravel as normally done with alpines and germinated in open

HEAVY RAIN AND HEAVY SOIL

Another factor in the favour of rhododendrons is that in the afternoon most of the area is shaded by distant trees. Living as I do in mid Lancashire, rhododendrons do better without too much shade, but if we have any further summers like the last one I may have to modify my gardening. The soil here is a very heavy clay - not really suitable for rhododendrons, but because in normal years I get about 1250mm of rain I can sit them in shallow depressions, mounding up with composted bark, peat and sharp sand. Those in the rock garden get topped off with an inch or so of gravel which they don't seem to mind. Clearly rhododendrons bought from a nursery which grows them in the open ground have the right shaped root system to allow this planting. I seldom buy containerised plants and no member of the SRGC need do so either having, as they do, perhaps the best rhododendron nursery in the UK (if not the world) in their midst.

HOW TO CHOOSE

What should we grow in our rock gardens out of the multitudes of varieties available? Sticking to ones which grow in mountainous terrain doesn't always work. *Rh. yakushimanum* grows on windswept Japanese mountains but, in all but the massive rock garden such as the one at the Edinburgh Botanic Gardens, it is out of scale; its foliage is too squat and heavy and its flowers, exquisitely lovely as they are, are too large in the company of the tiny treasures we try to grow in our rock gardens. There are, however, many species from the Himalaya and China which will provide the right material. You may have noticed I admitted to growing 600 'clones' rather than species or hybrids.

> *It is as well to remind ourselves that a species is a concept originating in a taxonomist's mind (or imagination perhaps) and, where a species is variable, as gardeners we should be seeking out the best clones available*

The names of more recent hybrids refer to clones and so the problem of getting a good plant only applies to those bad old days when hybrid names were given to an entire grex (all the seedlings of a particular cross).

PEST CONTROL

As the leaves emerge be on the lookout for aphids; these can distort the leaves and flowers as well as spreading virus to your plants. We use a combined systemic and contact insecticide, alternating between two with different active ingredients in an attempt to prevent a super-race of aphids, immune to sprays, developing. We have not found any of the sprays we have used to damage any of the bulbs, certainly not more than the aphids would have done! We have tried most of the readily available brands, making sure not to exceed the recommended dose.

KEEP ON WATERING

By the time the bulb is in flower and if the leaves are well developed, copious quantities of water are required at regular intervals. Pots are best checked daily in bright sunny weather and every other day if cool or dull, but you will be rewarded by visiting them daily to see the blooms. It should be stressed that water should be given in proportion to the amount of LEAVES, not flowers, since some types, some crocus and colchicums, for instance, flower some time before the leaves appear and too much water in these cases can cause rotting and damage the bulbs.

LIQUID FEEDS (October/November)

By the end of October / early November, many crocus and narcissus have fast developing leaves and we like to apply a supplementary liquid feed to supply some nitrogen to help the new leaves and roots. We have used Phostrogen and are now using MirAcid or MiracleGro at the recommended strengths. If, like us, you use a resin-based slow release fertiliser, such as Osmocote, you should be aware that the nutrient release varies according to temperature, so that nutrients are not wasted by being released when it is too cold. The bulbs are, however, growing during the winter and so need a supply of food during the cold spells. As well as the liquid feed supplements we also scatter a pinch or two of Growmore pellets on the surface of each pot when the leaves appear so every time you water, some food is washed down to the roots. Why then do we use the resin-based fertiliser at all? The use of Osmocote comes into its own in autumn, during mild spells in winter and especially in spring, when other fertilisers would have long been washed from the compost.

FIRST NARCISSUS FLOWERS (NOVEMBER)

By early November you could be enjoying the first of the narcissus flowers, *N. cantabricus* with us, and *N. romieuxii* buds will be showing, General care at this time is the same routine of checking pot moisture at least once a week. We do not water when it is very frosty, or when the air is very heavy with moisture, because of drizzle or mist. It is important to watch early flowering species such as crocus in damp weather conditions as mildew can establish on the faded flowers and transfer to the leaves, or down to the bulb. It is best to remove dead crocus flowers by a sharp tug upwards while placing your fingers and the compost to ensure you do not pull up the corm.

During the winter the bulbhouse receives maximum ventilation, with side vents and door open every day, except when the temperature is sub-zero (centigrade) or the wind is too strong.

We close the house every night and open every morning in case a storm blows up in the night, The *Narcissus rupicola* types do not appear until late December or early January, when the first frits will be just showing, It is crucial that these pots do not dry out, so, as well as watering the plunge, an occasional light water into the pot to ensure even moisture is a good idea. This is especially important in large pots where the centre might dry out. Although there may be no sign of growth in some of the frits at this stage, their roots will have formed and their shoots are developing just below the surface so these pots must not be allowed to become arid either. By late January most pots will be showing some sign of activity. As the frits come up, the procedure is more of the same, with plenty water and additional feed as the leaves and flower stems extend. The *Narcissus rupicola* types and the frits will take your flowering period through May and into June with some of the later species. It is only through experience and observation that you will learn the requirements of each plant. For example, certain frits like less water than others from the time the flowers open till the plant goes dormant. It is not possible to list these since we have, for example, one *Fritillaria crassifolia* that wants water in plenty up to seed set and another *F. crassifolia* which if you do not

reduce the watering at flower bud stage, starts to suffer. It is best to err on the side of plenty water and if you see any sign of rot or yellowing of the leaves, ease back on the watering, allowing the plant to become almost dry between waterings.

SEED PRODUCTION

When your bulbs are in flower, think about seed production and fertilise with a paintbrush if there are no insects about. This is more necessary with the winter flowering narcissus and early frits as there are usually plenty flies and bees about in the spring. We spend most of the spring show time trying to prevent insects pollinating the show plants as they go over more quickly and do not show so well. As soon as they have been to a Show we hand pollinate. Sometimes this is done at a Show as this is a good opportunity to cross-pollinate with another clone and the owner is usually pleased to exchange pollen. Always ask first! Much is written about not letting your bulbs set seed on the grounds that this weakens the plant the following year. Nonsense! A bulb that is setting seed grows for up to six weeks longer than an un-pollinated or dead-headed plant will and this more than compensates for the extra effort you ask of it. Plus, many seed pods are fascinating in themselves and an extra attraction.

It is also a good insurance to sow a little seed each year so you always have young and healthy stock coming on. You never know, you might just raise an exceptional form

Watering should be cut down as the seed pods swell and as the flowers fade if no seed is set. The leaves will usually start to yellow, which is your sign to reduce the watering to keep the compost just moist. A good liquid feed as the flowers fade also helps fix the buds for next season's flowers. If you have a pot of bulbs, some of which have set seed and others which have not, you have to compromise and do local watering. We water the area around the seeding stem, rather than the whole pot. This provides enough water to the fruiting stem while maintaining a reasonable moistness in the pot. Once the seed pods have developed and the leaves continue to yellow we stop watering directly into the pot but continue to water the plunge so that the compost in the pots does not dry out completely. Water is only withheld towards the end of June, about two weeks before we start to repot the bulbs in early

July. We cannot stress enough the importance of ensuring your bulbs have plenty of food and water during their growing period and only dry out for a very short spell, if at all.

THESE ARE THE METHODS WE USE

This article is intended as a guide and is our starting method for cultivating any summer dormant bulbs. It seems the majority of these respond well to this treatment. There are a few that require slight variations, mostly in how much water to give and when to reduce the watering. These you will discover for yourselves by careful observation of your plants.

The bulbs that we grow by this method include *Colchicum, Crocus, Fritillaria, Narcissus, Leucojum, Tecophilaea, Sternbergia, Tulipa, Arum, Iris, Muscari* and *Romulea.* Figs.10 to 13 (pp.36 &37) illustrate some of these bulbs.

Illustrations

Fig.10 p.36 *Narcissus watieri* bulbs in pots
Fig.11 p.36 *Narcissus watieri* in flower
Fig.12 p.37 Bulb house in April
Fig.13 p.37 *Crocus scardicus*

E-Mail

The Club is setting up a list of E-Mail addresses.
If you would like your address to be included
please send a message to Barry Caudwell at
FBCAUDWELL@BAD.DUNDEE.AC.UK

Please put in the Subject box
" SRGC E-MAIL list"

BULB GROWER'S CALENDAR

1 September
First autumn storm; soak thoroughly
1 October
Second storm.
November
Keep the plunge watered. Water direct into pots showing leaf growth and give occasional liquid feed.
December
Similar to November, give plenty of water to plants with leaf growth in good weather. If the weather is freezing or very grey, it might be three weeks before watering is needed. If it is bright and not freezing, water may be required weekly.
January
As December. Watch for frits showing.
February
More of the same. Most bulbs should be showing by the end of the month.
March
Copious watering is required. Some of the early narcissus will start to set seed and watering directly into these pots should be slowly reduced.
April
Peak flowering; lots of water required. Liquid feed.
May
Keep plunge wet and reduce watering into pots as flowering goes over. Last chance to liquid feed to encourage next year's buds.
June
Only a few pots will require direct watering. Keep plunge moist until the middle of the month.
July
Repot and plunge. Moisten plunge.
August
Have a break! – but keep plunge moist.

PLANT PORTRAITS

Viola cotyledon aizoon SSP. (F&W 7201)
Ian and Margaret Young

We have been attempting to grow the rosulate violas for a number of years now and have succeeeded in raising a number of species and even flowered a handful but none to compare with this little charmer. The seed was collected at Laguna del Maule (2200m) in Chile by Flores and Watson in March 1992, The site is described as mountain slope by a lakeslide, the ground being semi-compacted to loose volcanic pumice sand and the climate is basically of the Mediterranean type with snow cover in the winter and long hot summers with occasional rain storms.

The plant is very similar to *Viola cotyledon* with elliptic-spathulate leaves with a distinctive white edge that form a neat rosette not unlike some saxifrages. There are branches forming both at the base and from some leaf axils and the plant should make a very attractive compact mat of rosettes.

We sowed the seed in December 1992 in our standard seed mix (equal parts peat, loam and grit) and it was left in an open frame until it germinated in spring 1993 when it was pricked out into the same compost mix in a 3cm clay pot and plunged in our alpine house right in front of one of the fans that we run all the time. Kept well watered all summer and moist in the winter, the plant was potted on in spring 1993 when roots were showing through the drainage hole. The whole plant including the 3cm clay pot was placed into a larger pot of fresh compost, a method we have used successfully with difficult alpines over the last few years. (The old methods are often the best).

We first got excited when we noticed the small buds at the base of the leaves near the top of the rosete in April 1994. The flowers that opened towards the end of May were 1.5-2cm across, a beautiful violet colour with a yellow bearded throat and a delicious scent (Fig.14 p.54). Despite regular attention with the paint brush our lone plant set no seed and as there are not yet sufficient offshoots for us to attempt cuttings; perhaps this year ? At the time of writing (Feb '96) flower buds are just visible. We are sure this plant should survive outside in a trough or raised bed given some winter cover and we cannot wait to get more plants so we can try.

RHODODENDRONS IN THE ROCK GARDEN

Endless possibilities for combining rhododendrons with other rock garden plants

by PETER BLAND

In the rock garden? Surely current wisdom suggests we should grow all our dwarf rhododendrons in specially prepared peat beds (nowadays without peat, of course) along with other members of the Ericaceae, all other alpine plants being happiest in raised scree beds and troughs. Plants are easier to manage following this arrangement - indeed my garden features all three environments - but I wouldn't be without my rock garden. My desire to create miniature landscapes goes back a long way to a childhood spent without a garden, but attending a primary school that required us to make tiny gardens on trays with bits of moss and a mirror for a pond.

600 CLONES

I think formal raised beds, be they of grit or peat, and troughs are best located near the house. Attempts at creating rocky outcrops, preferably on a sloping site are best further away. My garden is two acres in extent so there is plenty (too much perhaps) of scope. The sandstone rock garden was made about 12 years ago using 10 tons of easily managed pieces of stone. Since these have made only shallow terraces I decided the landscape needed shrubs to provide shape and different growing conditions. Having fallen for the genus *Rhododendron* 30 years ago, I now find myself trying to manage some 600 different clones, and it was inevitable they should infiltrate my rock garden. Their presence there was further strengthened when I discovered I had constructed my alpine landscape on a deer trod; they have to be very hungry to nibble the rhododendrons.

HEAVY RAIN AND HEAVY SOIL

Another factor in the favour of rhododendrons is that in the afternoon most of the area is shaded by distant trees. Living as I do in mid Lancashire, rhododendrons do better without too much shade, but if we have any further summers like the last one I may have to modify my gardening. The soil here is a very heavy clay - not really suitable for rhododendrons, but because in normal years I get about 1250mm of rain I can sit them in shallow depressions, mounding up with composted bark, peat and sharp sand. Those in the rock garden get topped off with an inch or so of gravel which they don't seem to mind. Clearly rhododendrons bought from a nursery which grows them in the open ground have the right shaped root system to allow this planting. I seldom buy containerised plants and no member of the SRGC need do so either having, as they do, perhaps the best rhododendron nursery in the UK (if not the world) in their midst.

HOW TO CHOOSE

What should we grow in our rock gardens out of the multitudes of varieties available? Sticking to ones which grow in mountainous terrain doesn't always work. *Rh. yakushimanum* grows on windswept Japanese mountains but, in all but the massive rock garden such as the one at the Edinburgh Botanic Gardens, it is out of scale; its foliage is too squat and heavy and its flowers, exquisitely lovely as they are, are too large in the company of the tiny treasures we try to grow in our rock gardens. There are, however, many species from the Himalaya and China which will provide the right material. You may have noticed I admitted to growing 600 'clones' rather than species or hybrids.

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LEAF FORM AND SHAPE

Since rhododendrons are out of flower for 50 weeks in the year it is important to consider the leaves and form, and here I must confess to a problem. There is much less variety of leaf shape and colour in the dwarfs than there is amongst the larger plants. However, there are many subtle differences, which I am sure an alpine gardener, used to tending and observing little plants, will appreciate. I am fully aware of the head shaking of non-rhodophiles when we addicted ones turn over leaves and peer through a hand lens, but it really is fascinating getting to know all the different types of scales present on many of these plants.

BLUE LEAVES AND FLOWERS

I particularly like blue/green, almost grey, leaves and here it would be hard to beat *Rh. fastigiatum* in the clone known as 'Blue Steel'. When it flowers it is covered in lavender blue flowers like many of the plants in its section (Lapponica). Two hybrids rival its beauty of leaf: 'Intrifast' (*fastigiatum* x *intricatum*) and 'Ramapo' (*fastigiatum* x *minus*). They all grow slowly into a dome, but like all shrubs they continue to grow and eventually outgrow their position. However, unlike 'dwarf' conifers which have to be ripped out and thrown away in time, most dwarf rhododendrons respond well to drastic pruning. My first *Rh. fastigiatum* had reached one metre a couple of years ago: it is now back to a seven cm dome again. They are also fairly easy to propagate from cuttings taken from August to October and set in equal parts of sharp sand, peat and perlite. I drape the cuttings with a fine sheet of polythene which seems to help. The foliage of *Rh. lepidostylum* is such a lovely bluish-green colour, and fringed with hairs, that it is worth growing in spite of the fact that the pale yellow flowers in early June often go unnoticed.

Other plants in the lavender blue range I wouldn't be without are *Rh. polycladum*, with the nearest to blue flowers which sparkle over the plants in April - it is a great pity the taxonomists had to change its name from *Rh. scintillans* which suited it so much better in my opinion; *Rh. russatum* which in some clones has deep indigo blue or purple flowers; and *Rh. edgarianum* (Fig.16 p.55), recognised as a species by Mr.Davidian but not in the Edinburgh revision (for us gardeners taxonomic 'splitters' are greatly to be preferred to their 'lumpen' brethren). This flowers later than the

others at the end of May having clusters of a clear blue, so it always escapes the frost. Having admitted to another drawback, it is only fair to say that most of the blue flowered rhododendrons can tolerate some frost without damage. Not so the yellow ones I like to grow alongside.

YELLOW FLOWERED SPECIES

Perhaps the best known of these yellow species is *Rh. keiskei* in its most attractive clone 'Yaku Fairy'. This is almost completely prostrate in growth (completely so in my plant which was browsed by a sheep one year) and flowers later than other clones of this species. If a frost is threatened I pop an inverted plastic plant pot over the plants at risk - if only it were as easy with the larger rhododendrons. Besides being a good plant in its own right, it has been used by Peter Cox to produce one of his justly prized hybrids 'Wren' (Fig.15 p.54). Some other yellow flowered species aren't as easy to grow as 'Yaku Fairy' and here again Peter has made 'Curlew'and 'Chikor' for us, both floriferous and good doers. Perhaps my favourite yellow, though, is *Rh. hanceanum nanum* which in its true manifestation is a good yellow and flowers a month after the cream flowered *Rh. hanceanum*, at the end of May.

AROMATIC FOLIAGE

In the rock garden I have many representatives of the genus *Daphne* which have the added advantage of scent. Whilst there are no dwarf rhododendrons with sweetly scented flowers, members of the Pogonanthum section have strongly aromatic foliage. They also have similar flowers to the daphnes. The rhododendron which I prize over all others in my rock garden hails from this section: *Rh. primuliflorum* but here again it is vital to obtain the clone 'Doker La' AM1980 which is floriferous and compact, having little round heads of a delicious icing sugar pink in late April. It has a close relative *Rh. trichostomum*, which puts on an equally good show a month later: clones to look out for are 'Collingwood Ingram' FCC1976 with rose flowers and 'Quarry Wood' AM1971 with white. Another in this section with beautiful creamy white flowers is 'Maricee' a more reliable plant than *Rh. sargentianum*, which along with *Rh. anthopogon* objects to hot summers - perhaps this consideration applies less north of the border. Finally in this group with daphne – like flowers I must include 'Sarled' (*sargentianum* x *trichostomum* var. *ledioides*) which has pure white flowers.

LEAF INDUMENTUM

One of the lovely features of larger rhododendrons is the presence of indumentum under the leaves, which I actively encourage visitors to touch as well as look at. Unfortunately there are only a couple of small plants with indumentum suitable for the rock garden. *Rh. tsariense* has little obovate furry leaves. It is quite variable tending to merge with *Rh. flinkii* and some forms of *Rh. lanatum*. The flowers are white flushed pink with crimson spots. The clone I have is quite attractive but doesn't flower regularly. Perhaps the one named 'Yum Yum' which got an AM in 1964 is the one to look out for. The other plant with indumentum is even less likely to flower, but has superb foliage, for all the world like a miniature *Rh. yakushimanum*. *Rh. proteoides* has thin furry leaves no more than 4cm long, which need protecting from late frosts and slugs, though you may need to consider a bank loan if you want to include this little gem!

PINK FLOWERED DWARFS

Besides *Rh. primuliflorum* there are other pink flowered dwarfs worth including. Two of my favourites are American hybrids. *Rh.* 'Anna Baldsiefen' flowers regularly and is a really bright pink, and, while it flowers in March or early April I have found the flowers are able to cope with some frost without damage. *Rh.* 'Ginny Gee' flowers later, the leaves completely disappearing under the white flushed pink flowers – it looks extremely good in late evening sunlight. *Rh.* 'Razorbill' a chance seedling grown and propagated by Peter Cox has bright pink, unusually long tubular flowers which open at the end of April. It was deservedly given an FCC after a trial at Wisley in 1983. Amongst the best of the pinks is *Rh. crebreflorum*, maintained at species level by Mr. Davidian but sunk without trace in the Edinburgh revision into the variable *Rh. cephalanthum*. It has two virtues over the usual *Rh. cephalanthum* in that it is smaller and more compact whilst at the same time having larger flowers. It is, however, not as easy to grow as the preceding hybrids.

AND A FEW REDS

The colour most difficult to come by in small rhododendrons is red, but there is one species with many virtues. *Rh. campylogynum* is a varied and very lovely species which flowers in late May. All forms of this plant are covered regularly with dainty bell-shaped flowers raised above the leaves on long pedicels. Many of the coloured forms are well worth growing, but there is one good deep red called 'Bodnant Red' (Fig.17 p.55) which got an AM in 1971. This, like a number of other dwarfs, sometimes puts on a repeat flowering in late summer. *Rh. calostrotum* has flowers in the purple range, but in the clone 'Gigha' FCC 1971 the colour approaches crimson, the flat flowers, like faces, beautifully poised over the attractive foliage.

COMBINING WITH ROCK PLANTS

There are endless possibilities for combining rhododendrons with other rock garden plants, and they are extremely useful for shading the roots of plants needing such conditions. I don't grow many bulbs in my rock garden because of the aftermath of grassy foliage, but this can be tucked under an obliging rhododendron. If you find rhododendrons clash with another plant they are easy to move, preferably in October, but, if they are quickly out and into a new position, this can be done at any time if we aren't in the middle of a heat wave or a frosty spell.

I have barely scratched the surface of rhododendrons suitable for the rock garden. We are very fortunate that so many plants are so easily available at the present time - it was much harder to find plants when I started gardening 35 years ago. We are also fortunate that there is an excellent book on the subject: 'The Smaller Rhododendrons' by Peter Cox. There you will find all the gems I have omitted, along with detailed information on cultivation and propagation.

THE OTHER ANDROSACES

A look at some of the primula-like Androsaces which have been greatly under-rated

by DUNCAN LOWE

For the past four years or so George Smith and I have been bent to the task of producing a comprehensive work of reference for the androsaces, covering all the currently known species, presently totalling over 150. This will supersede our old and modest guide to the genus, published by the AGS some 20 years ago. Of the many species added, some are still just tantalising descriptions and field notes, but quite a number are now with us, thanks to the efforts of recent expeditions into mountain territories which world events have opened up to exploration. In the course of the work I have become aware of just how many species do not fit the popular image of the Androsace as a compact and symmetrical mound of crowded rosettes smothered in flower. In fact there are as many species more resembling the primulas as there are cushion types, growing as a basal cluster of leaves producing upright stems bearing heads of bloom. These display much more clearly their connection with Primulaceae, to which the genus *Androsace* belongs. And quite a few of these primula-like members of the tribe are by no means as demanding as their mound-forming relatives, asking only for a place in a well maintained rock garden.

It further occurred to me that these and the more willing of the mat-forming types have perhaps not been made known and valued as much as they deserve, and that something should be done for them; so here is a selection of those 'other androsaces'.

A. albana. An underrated little 'drumstick' androsace which often behaves as a biennial, but can persist for three or four years, and in any case holds its place with self-sown offspring. The tight, globular umbel of pink or white flowers brings welcome colour to late spring and early summer. It makes a fairly dense basal rosette of curiously twisted leaves, occasionally clumping up to three or four. Given a rich scree (50-50 mixture of grit/chippings and

fibrous soil) it is completely hardy in my garden, spreading around in a restrained manner and needing hardly any attention.

A. bulleyana. We tend to disregard biennials, but this is one that should not be ignored. It is eye-catching from metres away, with its heads of not just red, but bright scarlet flowers (Fig.18 p.56). It is one of the treasures from China which has proved to be reasonably easy in cultivation. In its first year it develops a single flat rosette of narrowly spathulate leaves, up to 10cm across. Winter cold withers some of the outer leaves, but the plant is essentially evergreen.

Late in the following spring it raises a central stem to 10 or 15cm, plus several shorter ones in a radial array. The main stem blooms first, closely followed by those around it; then of course it begins to die, but sets seed in good quantity. It needs a sunny end to the summer for full ripening, but if the clouds roll in you can snip off the stems and stand them on a warm indoor windowsill to complete the process. I understand that its native habitat is hot and dry. My plants certainly flourished in the parching summer of '95, particularly in troughs. I have not yet exposed them to winter rain, but I shall try some without cover this year.

A. foliosa. In the drier, eastern and southern regions of Britain this herbaceous and very primula-like plant might survive the winter without assistance, but needs an umbrella elsewhere; otherwise it is undemanding and quite content in rock garden soil.

From a winter-resting bud it sprouts a tuft of of quite large, lanceolate leaves and two or three stout, 10cm tall stems bearing globular heads packed with up to 100 flowers of soft pink. These open progressively through late spring. Although short-lived in cultivation, it can be sustained by taking off rooted shoots and growing these on. Not a plant for a sun-drenched position, it appreciates some light shade during the hottest part of the day.

A. himalaica. A relatively recent arrival and very welcome. In a raised bed or rich scree it grows quite vigorously, building up a tuffet of dark green rosettes and raising numerous slender stems carrying open heads of palest pink flowers with a pearly cast to their petals (Fig.19 p.57). In the drier winters it gets by without overhead protection and, to give a measure of its vitality, it grew from a single rosette to a clump some 20cm diameter in two years,

Fig. 14 *Viola cotyledon* ssp. aizoon (p.45) J I Young

Fig. 15 *Rhododendron* 'Wren' (p.49) P Bland

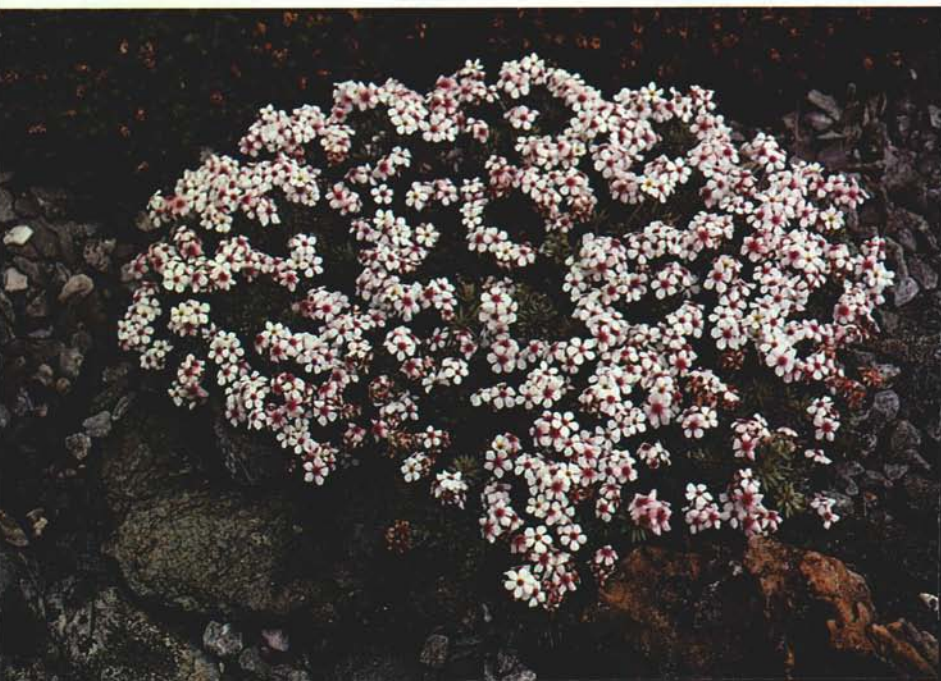
Fig. 16 *Rhododendron edgarianum* (p.48) P Bland

Fig. 17 *Rhododendron campylogynum* 'Bodnant Red' (p.50) P Bland

Fig. 18 *Androsace bulleyana* (p.53) Duncan Lowe

Fig. 19 *Androsace himalaica* (p.53) Duncan Lowe

Fig. 20 *Androsace villosa* var. taurica (p.60) Duncan Lowe



when planted in a raised bed. Placed in anything less than full light, or in an alpine house, it becomes drawn, weakened and a wraith of its true self.

A. lactea. Here we have a little charmer for the raised bed or trough, totally hardy and weatherproof. As the name implies, it has milk-white flowers, and these are held in very open umbels on airy stems above a knob of huddled, narrow-leaved rosettes. It never makes a plant of any size and lives no more than four or five years, but sets seed readily, so you need never be without it once acquired.

A. lanuginosa. All too often this unusual member of the tribe is planted in the wrong place for its manner of growth. It needs to be in a cleft, allowing the 15-20cm long stems to hang or sprawl over rockwork and should root into a lean soil that is perfectly drained. Then it can give you many summers of pleasure, setting its plentiful, globular heads of lilac flowers against grey-green leafage. If it looks woebegone after the winter, snip off the tattered stems and let it grow anew from the rootstock.

A. mucronifolia. For years we mistakenly grew various forms of *A. sempervivoides* under this name, until we acquired the real thing, collected by Dieter Schacht in Kashmir. Then the error was obvious, because, unlike the imposters, *A. mucronifolia* does not spread by stoloniferous rosettes, but forms a spreading mat from a central rootstock and flowers singly rather than in umbels. In a sunny scree bed it soon becomes established, spangling its carpet of clustered foliage with almost stemless, pink flowers. But after three or four years it goes into decline, as though it has exhausted some vital nutrients in its root run. A move to a freshly prepared spot in the same bed brings prompt recovery. Winter cover has no apparent benefits; this delighful species is completely hardy and untroubled by winter rain.

A. rigida. There is a startling contrast between earlier collected forms and those brought back recently from China. Both have umbels of bright pink flowers, but their foliage is markedly different, the earlier forms having fairly short, broad leaves in squat rosettes, whereas the recent arrivals have much longer, narrower leaves in arching rosettes. Although I have played safe

by giving the latter winter cover, it may not be essential. Both types have responded well to trough plantings in full sun. Hard frost can be lethal to the earlier introduced form when the young leaves are just emerging, but not at other times, whereas the newcomer has promise of more resistance to such damage.

A. rotundifolia. You might think that a geranium is emerging when this herbaceous species produces its spring growth, with its deeply lobed, long-stalked leaves up to 5cm across. It has been grown successfully in a well drained border, where it did not look out of place in the front ranks. This is a very variable plant which, at its best, can produce a fine umbel of up to 30 yellow-eyed, pink flowers on a 10-15cm stem. By growing selected forms, such as *A. r.* var. *elegans* you can avoid the annoyance of raising miffs.

A. sarmentosa. Perhaps the best known of all the androsaces; the one most likely to be found on garden centre stalls but, as a result of George's dogged and painstaking research, it appears that most of the plants cultivated under this name (with which we have been comfortable for generations) are invalid. They are far more likely to be *A. primuloides*, which itself has suffered revision and must now be called *A. studiosorum*! The differences are small but look at the bracts below the flower head and if these are of even length your plant is very probably *A. sarmentosa*, but if there is unevenness you have *A. Studiosorum*.

Leaving aside these niceties, however, the two species can be lumped together as garden plants, being essentially the same in appearance and behaviour.In a scree bed, where the drainage is faultless, my plants come through winter more or less unscathed, and are long lived, spreading steadily. Admittedly, winter cover is beneficial to condition and flowering, but it is not a must. The flower quantity and colour is quite variable, so it pays to see your chosen form in bloom before you acquire it. Henry and Margaret Taylor have recently introduced a white form of *A. studiosorum*, which is showing great willingness to grow and flower.

A. sempervivoides. Although similar to the two above this mat former has none of the obvious hairiness that they display and is even easier to grow. On screes and raised beds it is trouble-free and permanent, packing its rosettes so closely that weeds are unable to invade. Its pink umbels are generally on stems shorter than those

of sar*mentosa/studiosorum*. There is an interesting hybrid between this and *A. mucronifolia* which has more vigour than either parent and is an easy going garden plant.

A. strigillosa. One of the largest in the genus, this semi-herbaceous member makes clumps of tufted leaves up to 10cm tall. The strong, upright flower stems can be as much as 30cm high, carrying open umbels of large flowers, their petals white on the upper side and deep carmine beneath. In most gardens the plant needs winter cover, but otherwise presents no problems and will often provide self-sown seedlings.

A. villosa. This beautiful little mat former has an undeserved reputation for difficulty and is usually seen as a pampered alpine house subject, preened annually for showing. Yet by choosing the right form you can have it as a tough, long-lived, weatherproof garden dweller for a trough or raised bed. Some of the Pyrenean forms have this hardiness, as also do *A.*v.*arachnoidea* and *A.*v.*taurica* (Fig.20 p.57). The latter may need a pane of glass to help it through November to March, for which it will thank you with a froth of white flowers, turning crimson with age. For success in the garden make sure the drainage is perfect, the spot sunny and the soil gritty but nutritious.

An exciting number of new species are coming into our hands at the moment, usually in the form of collected seed. If you decide to try some of this, then when it germinates, which is more often than not, you will probably have at least half a dozen or so from each sowing to prick out and grow on. By all means treat the infants carefully to ensure some young plants, but when these have gathered strength, resist the temptation to put them all in the glass-house; they may not like it there and might do better elsewhere. So try some in beds and troughs, give them some help against pest attacks, and you may be very pleasantly surprised by the results. When you next encounter those immaculate, flower-studded buns on the show benches you can counter any feelings of awe or envy by thinking of those clumps and patches of bloom waiting for you back there in the garden, where you planted those 'other androsaces'.

I hope I have presented a good case for these garden-worthy androsaces, and I feel sure there will be more to add before long.

AUTUMN GENTIANS IN NEPAL

The amazing diversity of the autumn gentians around Gosainkund

by IAN CHRISTIE

Our botanical trip to Nepal with Alastair McKelvie as leader, left Aberdeen Airport on Saturday 30 September, 1995. After a lengthy flight via Heathrow, Dacca and finally landing in Kathmandu, our group of six were glad to be whisked off by bus to the Kathmandu Guesthouse, the mecca for all Himalayan explorers. We then spent a lazy couple of days catching up on lost sleep and fitting in a little sightseeing.

On Wednesday we left Kathmandu by bus along with our entourage of 22 sherpas and porters, making our way to Dhunche some 100km northwards over some very basic roads and at times skirting around rocks left from landslides. From Dhunche we started our trek heading for Gosainkund at around 4800m. At lower levels we walked through rhododendron and conifer woodlands where there were many forms of orchids growing. Next day at a height of 2600m we found acres of dwarf rhododendrons and berberis; here we also saw *Primula glomerata*, *Cyananthus* spp. and a number of rosettes of *Meconopsis* spp.

GENTIANA DEPRESSA

My main interest was to see gentians flowering in the wild and here at 3600m in the Laurebinayak Pass area I observed the first plants of *Gentiana depressa*. The flowers were closed but within an hour's walk there were large colonies in full flower, growing on well cropped grassy bankings; it was some time before I was persuaded to move on. As I walked further along the track I was surrounded, even on the pathway by *G. depressa* with many different shapes, sizes and colours in the flowers, some plants having only a few blooms whilst there were 10-12 on others.

AND NOW GENTIANA ORNATA

Continuing onward and upwards reaching an altitude of 4000m, the first few flowering plants of *Gentiana ornata* appeared, all with tubby-shaped sky blue trumpets. And, sure enough, within an hour's walk an abundance of plants with a wide variation in form, size, shape and flower colour. Unfortunately there was no time to explore further so we continued along the hillside following a rocky pathway alongside which grew both *G. ornata* and *G. depressa* in profusion.

Gosainkund lake proved to be a most interesting and very important area, with steep south-facing grassy bankings rising to around 300m above the blue mirrored lake. Here the mystery began; it was as if some magic paintbrush had been at work on this hillside. Night temperatures were a chilly -5^{o}C; fortunately the daytimes were warm (16-20^{o}C) so flowers remained open, thus enabling me to study *G. ornata* trumpet shapes. Many had typical tubby bell-shaped flowers, others were a narrow tubular shape, a few had very fluted petals and some had unusual curved petals all with the usual midrib bulge. Colour shades varied from deep to pale blue with a few flowers almost white (Fig.21 p.74). Most had distinctive calyx stripes and a few were heavily spotted within the corolla tube.

Foliage variations were also interesting. Some plants had broad-shaped leaves a few centimeters long; others were lanceolate and there were also tufted linear leaves 7-8cm long. Leaf colour ranged from straw yellow and apple green through to lush dark green. Generally speaking, the leaves of plants growing in moist gritty soil alongside small streams were a rich beetroot shade. Could this be an influence by minerals from surrounding debris left by recent monsoons? Larger colonies of plants were surrounded by masses of unflowered seedlings but in some areas only a few solitary plants existed. There is no doubt that the heavy moisture laden mists which rolled up late afternoon and early morning provided plants in the dry turf and rock crevices with life-giving moisture, I am also sure this same mist knocked early morning frosts from the flowers thus preventing scorch.

THE VARIATION BEGINS

It was by chance while studying these that I came across a *very* different flowering plant, like *G. depressa* apart from the very obvious *G. ornata* foliage; the trumpets were very squat

campanulate bells fully open about 5 cm across in a vibrant blue which almost matched those of *G. depressa* (Fig.22 p.74).

Further sorties along this steep hillside dotted with large rocky outcrops revealed several similar plants. Dare I suggest the possibility of hybrids between the two species? It was at this time, I decided to look for possible pollinators and sat amidst the flowering clumps. No sooner had I sat down than along came a large red-bottomed bumble bee, I set off in pursuit to photograph it but it proved somewhat elusive; I was stumbling around, while it could fly with ease at around 5000m. Searching around for more bees led to my most exciting find yet, there on a raised banking at the base of a rocky outcrop I found some very pale blue *G. depressa* flowers and – glancing upwards, could that be a white one? Almost, just a tinge of blue, but over to the right three perfectly white flowers with clearly visible black triangular nectaries at the base of the corolla tube, quite breathtaking (see Front Cover). On this one banking *G. depressa* flowers were blue with white, pale blue and even a superb turquoise, all of which I can only assume were influenced by the dark blue and white flowered plants which all grew within a five metre radius. Elsewhere the flowers were varying shades of blue, all on low tufted rosettes with bright green broadly ovate leaves which encircled the calyx. It wasn't until the next day about two kilometres further along the hillside that I came upon another white colony of *G. depressa* with again quite distinctive variations similar to those around the other white flowering plants.

POLLINATION

I discovered more bees rather like large honey bees, browny yellow, few in number, along with several more of the one I had seen earlier, but these were the only insects seen visiting the gentian flowers. The calyx base of some trumpets had a hole which had been eaten by the bees to get at the nectar when the flowers are closed (this has been observed at my nursery). Whether some flowers are pollinated by other vectors and seed dispersed by wind is not known.

DOWNWARDS AND MORE GENTIANS

I am convinced plants were washed down the hillside by monsoon flood, and many had quite clearly re-established at lower

levels right down to the edge of the lake. Early one morning we set off together to explore the mostly north-facing slopes on the other side of Gosainkund lake. En route over a slippery scree we passed several small colonies of *G. ornata* with many colour variations. We did not find any *G. depressa* growing here, not even on the sunny hillocks around 300-500m above the lake.

Time flew past and we had to leave to head homewards; a steep climb to 5300m was our only way out, so amidst bright sunshine we set off. All along the pathway both gentian species survived but only *G. ornata* continued to grow on the high top ridges – a slight descent then again both grew in abundance. Lunch time approached and we were engulfed in thick wet mist; the day became very much colder and visibility was reduced to no more than a few metres Plant hunting was impossible until late afternoon when the mist cleared. *G. ornata* and *G. depressa* were still abundant, then, at approx 4500m, we saw the very distinctive rosettes of *G. prolata*, dark green apiculate leaves forming small congested clumps, a few slender tubular trumpets, dark blue with greeny yellow stripes on the corolla. Unfortunately most flowers were past but fat seed pods had formed. This species was not observed after a descent of around 330m.

Soon *G. depressa* was left behind, and *G. ornata* was seen growing for the rest of the day, but as we came upon dense rhododendron and berberis thickets heading for our campsite at Phedi, only a few plants were found. Our journey downwards was through large rhododendrons and *Acer acuminatum* with its superb autumn tints and there amidst the rich leaf litter were thousands of petiolarid primulas. What a sight these must be in spring when in flower. Our trek was then via Tharepati, Mangengot, Chipling and Pati Bhanjyang, along the way passing several colonies of both *G. ornata* and *G. depressa*. As we left the Langtang National Park and sat down for lunch more *G. prolata* rosettes and ripe seed pods were found.

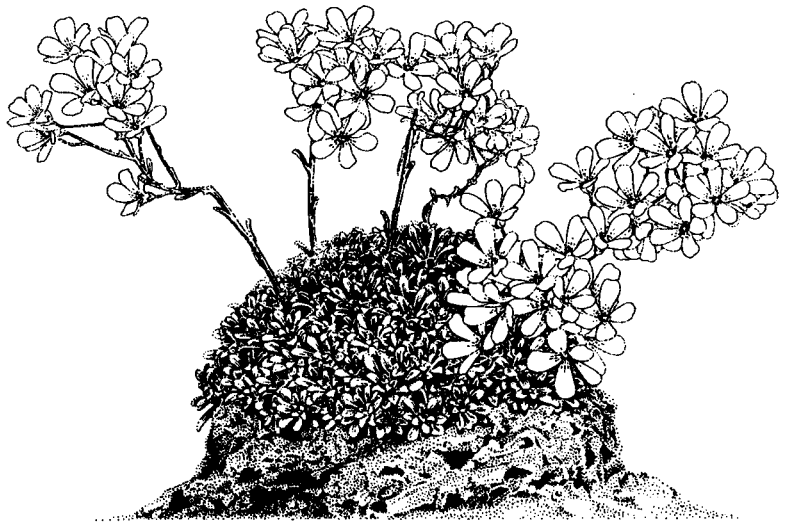
It is likely that in such a botanical wonderland we passed countless unseen treasures. I can only say here's to the next time and many thanks to Alastair for guiding us through this one.

A SOCIETY FOR SAXIFRAGES AND THEIR LOVERS

by MALCOLM McGREGOR

Perhaps at no time since the First World War has there been such an enthusiasm for (over)specialisation. Victorian and Edwardian collectors scoured the world for rarities, made collections of beetles and butterflies and birds' eggs, of shells and ferns and trilobites. Museums with drawers of insects and glass cases of hummingbirds; orchid houses; rock gardens; collections of wildfowl - all exemplify the Victorian enthusiasm for Natural History and for collecting. Whatever poverty there was, an educated elite had sufficient leisure as well as sufficient money to pursue their recondite enthusiasms.

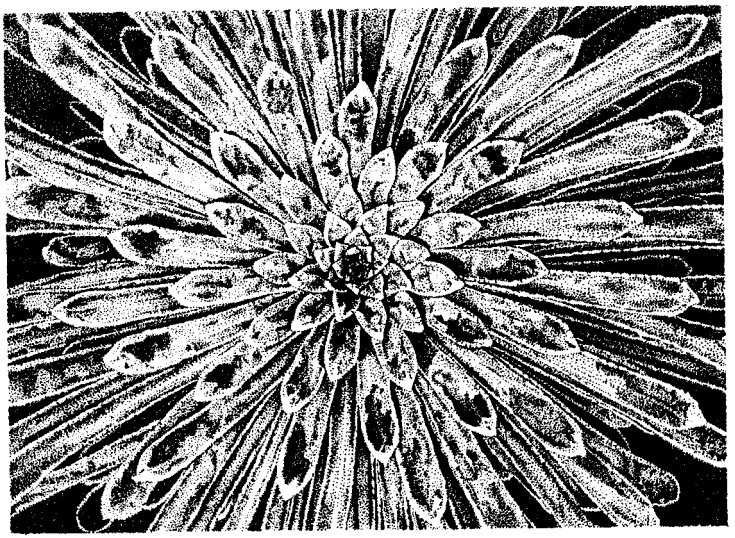
Now in the last decade of the twentieth century, the enormous upsurge in the enthusiasm for collecting has led to such things as auctions at Christies of fountain pens, of ephemera and collectibles (a term used to cover those items which no-one has ever bothered to collect before the last few years); and at the same time to ever-increasing and ever-narrowing specialisation. In the garden this has produced marvellous opportunities: specialist nurseries are flourishing as they have not since the early years of the century. Throughout Britain, growers of rock garden plants have a staggering range of plants available and with that availability has come specialist groups: the Saxifrage Society is just one of these but we all have our particular loves in the rock garden and saxifrages are mine.



Saxifrages belong to one of the major genera in most rock gardens but they are not confined to the rock garden. The genus is usually divided into a number of sections of which around half are represented in cultivation. The most common in the ordinary garden are the London Pride group of saxifrages and the hybrid mossy saxifrages. Both of these sections have members which are able to survive the cavalier treatment which even the most dedicated rock-gardener tends to mete out in the more neglected corners of their demesne. With more care however, hybrid mossy saxifrages can provide wonderful displays at the front of a border (Fig.23 p.75); they have amongst them the magnificent *Saxifraga* 'Wallacei' which has the largest of all saxifrage flowers, and deserve wider appreciation. But to most specialist alpine gardeners the key sections are still the Ligulatae and Porphyrion sections.

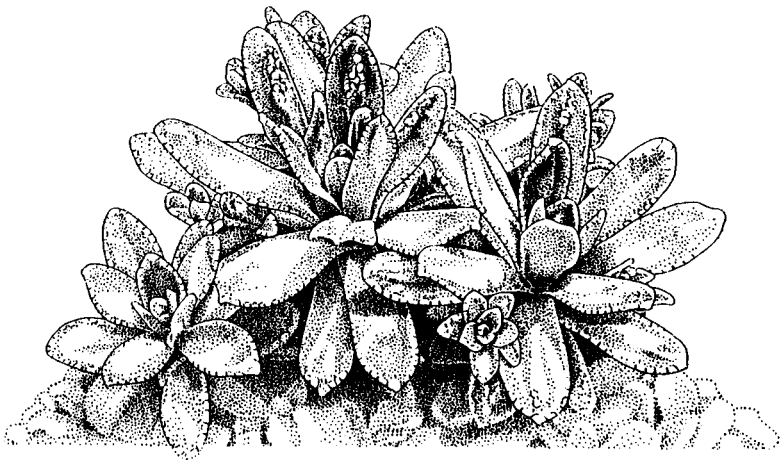
The Ligulatae are the silver saxifrages, the lime-encrusted rosettes of which form the hard, textured cushions which are complemented by the sprays of predominantly white flowers in late spring. Predominantly European, the species, such as *SS. paniculata, cotyledon, cochlearis* and *longifolia,* are quite robust in general but have been selected and crossed to form a range of hybrids and cultivars which include the striking 'Southside Seedling' and 'Tumbling Waters' as well as a range of smaller and subtly attractive plants such as 'Whitehill'. Few of the silver saxifrages are difficult and the frothy clouds of blossom from a mixed grouping of these can be truly spectacular.

The Porphyrion saxifrages are for many the greatest delicacy among the choices the genus offers. Containing the Kabschia, Engleria and Oppositifoliae saxifrages this section originates in the mountains of Europe, of the Caucasus and Iran, and of the Pamirs, Hindu Kush, Karakoram, and Himalaya.



Here are high-alpine cushions studded with flowers which are so much prized in every alpine grower's collection (Fig.24 p.75). And yet, unlike so many other genera, almost all these cushions are easy to grow. Above all they remain in character. The species have been supplemented by the range of hybrid cultivars which are constantly appearing both from the Czech Republic as well as the UK. Despite the growing genetic complexity these retain the growth habits of their alpine ancestors – unless of course they are grown for show when it is quite possible to feed them up to bursting. The range of colours has been extended from the original palette of white, yellow, red and bluey-mauve, to encompass increasingly vivid mauves and purples, stronger reds, orange, and subtle pastel shades of pinks, apricot, salmon, peach, tea, buff and cream.

The Saxifrage Society's aim is to encourage the cultivation and enjoyment of Saxifrages in gardens and in the wild. It promotes activities such as lectures, plant displays and meetings and is building a collection of slides. It has had trips to Derbyshire looking at wild saxifrages. It gives advice on such issues as cultivation, identification and nomenclature, and is recognised as the International Registration Authority for Saxifraga cultivars. It is building a collection of slides. However, as far as many members are concerned it is the publications which matter most when they join a society and in that respect the society has set a high standard. Its magazine is a highly professional A5 publication of around 80 pages an issue, which has published articles by many of the leading figures in the world of saxifrages. Well-known British figures such as Winton Harding, John Byam-Grounds, Ray Fairbairn, Adrian Young and Duncan Lowe have been supplemented by newer writers: in particular Beryl Bland (who recently wrote for the SRGC) is now about to publish the third in a series on the Silver Saxifrages which is redefining our knowledge of a group of plants which are well-known in most rock-gardens.



These have been supplemented by writers from abroad: Rick Wagner from the United States and Rex Murfitt from Canada, and a number of the leading figures in the Czech Republic: Jan Burgel, Karel Lang, Jiri Novak and Miroslav Kraus.

Illustrations are obviously a problem: no society with around 250 members can possibly afford to move to full colour printing (although the Androsace Group have made great strides with colour copying rather than printing) but the Saxifrage Society has illustrated its Saxifrage Magazine with the very best of black and white illustrations. The best known of the illustrators is of course Duncan Lowe, but the work of a number of others has helped to make a very distinctive contribution to the magazine. The studied calm of the meticulous illustrations of silver saxifrages by John Howes (as seen in this article) has enhanced the articles by Beryl Bland as well as those of others, and provided definitive illustrations of a number of problematic plants. Pen and ink drawings of a range of Porphyrion saxifrages by Barrington Barber have complemented these with great brio, whilst scraperboard and line illustrations by Ken McGregor, who also contributes articles, have provided an unusual and distinctive element.

When the Saxifrage Society started it was not clear whether it was possible to create much more than an annual listing of new cultivars which everyone could rush around trying to collect and it certainly does do this. In three years the magazine has published the formal Latin descriptions for nine new hybrids: x *baccii,* x *goringana,* x *lismorensis,* x *youngiana,* x *rayei,* x *novacastelensis*, x *pulvilacina,* x *krausii* and x *quagrata*; and published details of around two dozen new cultivars as well as preliminary information on quite a few more. So it has certainly served this function in part but I think now it is clear that it does more. Articles on hybridization, on new discoveries of *S.* x *luteo-purpurea*, on growing Himalayan saxifrages of different sections, on identification of mossy saxifrage hybrids, the history of the Prichards' various plants and nurseries, have each contributed to our knowledge of the genus. Two years ago the magazine published a piece about the new hybrid 'Cumulus' which had been referred to as a *S. iranica* hybrid. Last year this was followed up by a discussion of the dubious nature of much of the material cultivated as *S. iranica* and the problems equating this with the published descriptions. In the forthcoming issue the answer to the conundrum and the status of cultivated plants will be clarified further. Only through a specialist forum would such an argument develop. The magazine houses a broad church though, with the pseudonymous *S.* '*Paradoxa*' tilting ironically at both windmills and sacred cows.

All members of the society receive all publications free and in three years now the society has published two other publications alongside its annual magazine. In 1993, we published a short guide to the new Kabschia and Engleria cultivars which had appeared since the publication of Horny, Webr

and Byam-Grounds seminal work, *Porophyllum Saxifrages*. In 1996 we have published the definitive register of all saxifrage cultivars *Saxifrages: the Complete Cultivars and Hybrids* which was reviewed by Duncan Lowe in the last issue of *The Rock Garden* (p.415). As Duncan Lowe says in that review, "Among those who could not imagine the rock garden without saxifrages there are those who think that there are already too many cultivars, and others who are almost addicted to producing even more." The Saxifrage Society is for both these groups and for those who just like to feel they know what's going on.

Like all such specialist groups the Saxifrage Society thrives around a small core of dedicated contributors and enthusiasts. Unlike some specialist groups though it is resolutely independent. The Saxifrage Society aims to provide its members with information, with entertainment, with a magazine about the plants they love in the company of others who share their enthusiasm. I have made many friends – at meetings, by letter, by phone. I've exchanged plants and seeds with members round the world. I've visited the gardens of members and been visited by them. I now couldn't imagine being without it.

Membership in the UK is £6.00 per year, for which members receive free all publications published during the year. Overseas membership is £10.00. Write to Adrian Young, Secretary, Saxifrage Society, 7 Alpha Court, Hockcliffe Road, Leighton Buzzard, Bedfordshire LU7 8JW (or phone 01525 854559

The line drawings accompanying this article are by John Howes

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SEED EXCHANGE

Again we had a very successful year. Margaret and Henry Taylor must be congratulated on organising the packing with the help of the Angus Group. This was accomplished in time for the Distribution to begin before the New Year. Mr Wilson has the use of a room at the Botanic Garden in St Andrews for the Distribution but must vacate it by the end of February, hence the need to get your seed order to him as soon as possible.

As usual the instructions for the Seed Exchange are on Page 7 of the Year Book. Home non-donors must send a SAE before 14 December. Any arriving after this date will be filed for the next year. The June 1995 Journal explains things in more detail.

Our Seed Exchange cannot survive without Donors; they are the most important people. Good seed, as much as you can supply, is needed before the rest of us can do our bit. Please keep sending it to me as early, as clean and as neatly labelled as possible. Jean Wyllie

PRIMULAS IN SICHUAN

An expert on rhododendrons takes a look at some of the rare and desirable primulas of temperate China

by PETER COX

I have been fortunate in being able to make eight trips to China and have spent the whole time hunting for plants in the temperate flora-rich provinces of Sichuan and Yunnan. While my chief interest has always been in rhododendrons, primulas have become an increasing fascination to me and I have been lucky to see many species, some unknown in cultivation and others which have been introduced, only to be lost again within a very few years. Sichuan is in west China and is the most populous province with over one hundred million people. Luckily for the plants, most of the province is actually mountainous and a large majority of the people live on the very fertile plain in the centre. Visitors usually travel to mountainous western Sichuan by first flying into the capital of the province, Chengdu. Being low-lying and with little wind, Chengdu frequently suffers from smog and the quicker one drives out of it the better. The great thing to look forward to is the first sight of the mountains through the haze.

WHY DO WE BOTHER ?

The sad thing is that our climate just does not suit most of these Asiatic primulas. They are used to being protected by snow for up to nine months in the year, with a brief awakening period when they rapidly come into flower. They then set seed during the moist monsoon period and go quickly back to sleep under their snow blanket. Not only are our winters with their start-stop cold spells (or none at all) totally alien to them but our growing seasons are far too long, often with prolonged dry spells. When we do have one of our moist summers, some of these primulas may appear to flourish. On several occasions I have had so-called difficult species grow into something resembling a cabbage, only to find them completely rotted off after the winter. Despite these climatic differences, it is perhaps surprising that some are actually quite

happy in our gardens, if they are given a favourable site and a considerable amount of TLC. One of our greatest difficulties is that different species of primula in the wild grow in an amazing number of different habitats from an extraordinarily dry position under a rock or on a dry cliff to actually growing in water which is usually running. A favourite habitat is on a north slope on a near vertical bank with a constant supply of water dripping through their roots. So not only is our climate all wrong but it can be just about impossible to simulate their actual habitat.

> My son Kenneth goes as far as to say that primulas are better left in their own homes as the mass of flower often seen can only ever be insultingly imitated at home. He may be right but there is always that challenge of succeeding with a so-called impossible plant.

Real success is, of course, not in just flowering a particular plant but in either being able to keep it alive and propagate it vegetatively or being able to get a constant supply of seed year after year for those species that are short-lived under our conditions. I well remember George and Betty Sherriff's famous bed of *Primula kingii* in their lovely garden at Ascreavie, near Kirriemuir, Angus. They kept it going for many years by collecting seed each year. After a while (probably due to inbreeding and a lack of biodiversity) it became harder to get good seed and eventually it was lost. The best hope in these cases is for several people to grow a plant and every now and then to swap plants or seed. The trouble is that there may not be enough expert growers around to keep the most tricky species going with gardens with the right conditions.

WHEN TO GO

All my trips to China have taken place either in April-May-June or September-October. I have yet to brave the months of July-August, the height of the monsoon season when a great many plants are in flower, especially at high altitudes. While May and June are undoubtedly good months for seeing flowers, it is amazing what can still be blooming in September, particularly after a winter of heavy snowfalls where patches may not melt until

autumn, if at all. If seed collecting is the main object, autumn has to be the choice. I have found a little primula seed in the spring. One year I collected quite a lot of a lovely species, so far unnamed, only to find it would not germinate. Once I passed through on the same road in spring and autumn and I endeavoured to collect seed of a particular species. Despite going to the same location, I collected the wrong species; it can be extremely hard to re-identify a species seen in the spring as they look so different and other species can come up and flower in the intervening period.

While some species are common to both Sichuan and Yunnan, many are not and a considerable number I have only seen in one or other province. Yunnan is mostly to the south and west of Sichuan and has generally a wetter, milder climate. Sichuan has more of a continental climate, being further east where the winters get colder. So plants in say central Sichuan at 2,000m are roughly equal in hardiness to those at 3,000m in north-west Yunnan. This is certainly the case with rhododendrons.

A ROSE BY ANY OTHER NAME

I am starting with primulas I have seen in Sichuan, to be followed in a further article with those of Yunnan. If the editor can put up with a third article, I may do another on Nepal (one trip only) and Tibet where I intend going this spring (1996). Most of the primulas I have seen in flower in Sichuan were on a trip in spring 1989, accompanied by Sir Peter Hutchison and Dr David Chamberlain. Peter is really more of a primula buff than I am so I have given him this article to check through and have borrowed one or two photographs from him. This trip was undertaken at the time of the Tienanmin Square troubles and we were lucky to get home on schedule. We were also very lucky to meet up with the leading Chinese primula expert, Professor Hu Chi Min, who named all our herbarium specimens for us. There are some disagreements in the classification of Asiatic primulas and the two most recent books on the genus by Josef Halda and Dr John Richards have many differing opinions. The same state of disagreement, of course, occurs in many genera, the one I am most acquainted with being the genus *Rhododendron*.

MA-SHAN-PING AND WOLONG

In the Ma-shan-ping Reserve near the Min river, to the north of Chengdu, we found *P. ovalifolia* of Section Davidii, unfortunately

out of flower (said to have pink flowers), growing on moist, shady cliffs, at low elevation. Species of this section are little known in cultivation and most are likely to be tender and difficult to grow. Also first found at Ma-shan-ping was *P. moupinensis* which takes the place of *P. sonchifolia* as a woodland-inhabiting member of Section Petiolares in much of central and southern Sichuan. I have found this species on several occasions, always in moist but not wet conditions, in dense shade (usually under rhododendrons) and often near a stream. It forms mats, having spread by the unusual method for primulas by thin runners, (surprisingly not mentioned by Richards), resulting in a conglomeration of plants not unlike an old strawberry bed. Unfortunately I have not yet seen the flowers which are lilac-pink to lilac-blue and have been produced in cultivation. It has responded moderately well in cultivation, having flowered and produced runners which should be removed and potted in case the parent dies, which can happen, resulting in total loss of parent and runners. The potential plants may be detatched, even without any roots, in early autumn and they will soon form roots. A very different plant, well-known and easy in cultivation is *P. polyneura*, one of the Cortusoides Section. I have seen it flowering profusely with its magenta flowers on a scape to 40cm on steep north-facing scree slopes or rock ledges in the Wolong panda reserve. Sometimes growing with *P. polyneura* was *P. kialensis* (Fig.26 p.77). This is a much dwarfer plant than the last. The leaves are white farinose below and the lovely flowers are mauve-purple with a prominent white eye. Richards places this species in Section Yunnanensis and says that species in this section have never lasted long in cultivation. At a lower elevation on shady banks was the well-known *P. malacoides*, with white flowers, often grown in a pot indoors. Also at Wolong on the slopes up to Balang Pass we saw *P. palmata* with its magenta flowers, deeply dissected leaves, white hairy petioles and 15cm scapes. This species is related to *P. polyneura* and has proved equally amenable in cultivation.

LUMPERS V SPLITTERS

The Crystallophlomis (Nivales) Section is causing a great deal of controversy between lumpers and splitters. Richards has rightly or wrongly amalgamated many previous species under *P. chionantha*, some as subspecies, others as synonyms. On one pass in NW Yunnan (see future article) I found an amazing variation within this

Fig. 21 *Gentiana ornata:* different flower forms and colours
(p.62) Ian Christie

Fig. 22 Possible hybrid *Gentiana ornata x depressa*
(p.63) Ian Christie

Fig. 23 Mossy saxifrages edging a border (p.66)
Malcolm McGregor

Fig. 24 A Collection of Porphyrion saxifrages (p.67)
Malcolm McGregor

Fig. 25 *Primula optata* CC&H 4088 (p.73) Peter Cox

Fig. 26 *Primula kialensis and P. polyneura* (p.73) Peter Cox

Fig. 27 *Primula orbicularis* (p.73) Peter Cox

group, all growing within a short distance of each other. Sometimes white and purple-flowered plants are growing together while in other places they are very uniform in both foliage and flower. On the Balang Pass on open grassy meadows there was quite a uniform population. The wide leaves and the scape were covered with white farina and the fragrant flowers were violet to bluish-violet with a white eye, opening amongst patches of snow. While we called this *P. melanops*, it seems to fit *P. sinopurpurea* better. Further north on the south side of the Mongbi Pass was a similar plant which we took to be a variation of *P. melanops* but Professor Hu Chi Min said it was *P. optata* (close to *P. limbata*). This was particularly vigorous, forming large clumps with very fragrant violet-blue flowers with a darker eye to 30cm (Fig.25 p.76). A paler form was found later on the edge of the Hong Yuan plain with nodding inflorescences. This species has not been in cultivation since 1924 and would be well worth reintroducing.

MONGBI PASS

North of the Mongbi Pass near a picturesque village, a pink glow in a meadow turned out to be quantities of *P. yargongensis* with fragrant pink flowers with a white eye on 25cm scapes. This is a dainty but not spectacular species which Richards treats as a synonym of *P. involucrata* which is easily cultivated and long-lived. In the forest above the meadow we were surprised to find the widespread *P. sonchifolia* which I have now seen in many places. This was growing under trees with its lovely fragrant lavender-blue flowers with a white eye, yellow in the throat. This species is not found in the ultra damp conditions that it demands in cultivation, no doubt due to the monsoon rains keeping it moist during the summmer.

To the south of the Mongbi Pass on open grazed south-facing slopes was a fine yellow-flowered Crystallophlomis primula that we were told by the professor was *P. orbicularis*. This has pale green farinose leaves with very fragrant lemon-yellow flowers with a darker yellow eye (Fig.27 p.78). Later, on the pass to Huanglongsi, we saw more of this species, this time growing on small grassy tufts in water. On a previous trip to this area I collected some seed which produced plants of this species and *P. tangutica*.

P. orbicularis grew well and flowered in a damp part of the garden at Glendoick for a year or two and then went the way of so many primula species in cultivation. The other species, *P. tangutica*, grew near by. This is one of the peculiar Crystallophlomis species from Subsection Maximowiczii, with small narrow-petalled reflexed flowers, in this case of a dark maroon colour with a musty fragrance, liked by some, but I dislike it intensely. Later I found it again on the Hong Yuan plain. This has survived rather longer in cultivation but did not take kindly to the dry hot summer of 1995, in common with many other primulas.

A relative, *P. szechuanica*, collected near Mujizo Lake in 1990 on wet banks by a river side, north of Kangding, has diminutive dull yellow flowers, also reflexed. Seedlings of this grew like cabbages at Glendoick but soon succumbed to our winters. On a drier bank in shade grew *P. rupicola* of Section Souliei, a small plant with deeply incised leaves and dainty pale to deep rose-coloured, yellow-eyed flowers. This has proved to be quite easy to grow and it sets good seed in cultivation. It is easy to confuse this species with the tiny *P. bella* out of flower.

Further north than Mongbi in the gorge of the Jo-mo-jo River in 1989 we found the newly named *P. fangii* (Section Pulchella) on steep shady banks, a tall species with pretty deep to pale pink flowers on scapes to 45cm.

HONG YUAN PLAIN

The Hong Yuan (Red Grass) plain, at 3,400-3,700m is a southern extension of the Tibetan plateau. It consists of broad, often damp, meadows surrounded with low rolling hills, with large herds of domesticated yaks, a beautiful place in good weather. The nomadic Tibetan herders live in large black tents called yurts which they move every few weeks to fresh grazing. Several species of primula grew in damp places or on the drier banks nearby. *P. stenocalyx* is a species that can vary considerably in size. Here it was small with pale purple flowers with white eyes; the leaves have greenish-white farina on the undersides. This grew on west-facing banks. On peaty tussocks in bogs was *P. fasciculata*. Only 3-5cm high, this is an attractive little plant with pink flowers with a yellow eye and annulus. I have seen it elsewhere growing happily in running water so it is obviously a species for wet conditions and is being quite successfully cultivated. A third species, again on tussocks, was *P. purdomii*, 20-45cm high. The flowers were very

variable in colour, bluish-purple to white with intermediate shades, mostly with a white eye. The leaves had a thick reddish-tinged median vein. Richards considers that this may be a synonym of *P. sinopurpurea* (*P. chionantha* ssp.).

In the far north of Sichuan is the Huanglongsi National Park with a peculiar limey river with white-edged terraced pools and white waterfalls. We found a member of the Muscarioides Section here in seed, up to 30cm high, which proved to be *P. watsonii.* This has dark purple tubular flowers in a tight inflorescence and is proving easy to cultivate.

There are of course many more species in Sichuan that I have not seen and it would be necessary to spend several whole growing seasons there, travelling throughout the mountainous parts of this province to have a hope of finding them all.

ERRATA

LESOTHO- THE OTHER KINGDOM IN THE SKY

(The Rock Garden XXIV p 385)

In this article by Mike Hirst, part of a sentence was inadvertently omitted.

Lines 14-16 read "Between the damper terraces were groups of *Lobelia preslii* reaching 12cm tall with yellow flowers produced above dark green narrow leaves "

These lines should, in fact, have read "Between the damper terraces were groups of *Lobelia preslii* reaching 45cm or more in height with blue flowers borne on slender stems and *Gazania linearis* up to 12 cm tall with yellow flowers produced above dark green narrow leaves "

GROWING PLEIONES

A practical guide for all those who find growing and flowering of pleiones difficult

by MAVIS KENT

I was introduced to pleiones by the late Jack Crosland in the mid 1970's when I won a pot of *Pleione limprichtii* in the Aberdeen Group Raffle. Jack gave me these instructions:

1. **No heat** (*P. humilis* frost free)
2. **Protect from rain** in winter in cold frame or unheated greenhouse
3. **Semi-shade**, not full sun
4. **Water carefully** when growth begins in the spring
5. **Water liberally** in summer until leaves fall in the autumn
6. **Keep dry** but cold throughout the winter
7. **Re-pot** in January or February when dormant

Compost
1 Part each of :
John Innes No.2 Compost
Coarse Sand
Sphagnum Peat
Live Sphagnum Moss

I followed these instructions and was very successful for several years. Then about five years ago I had problems, not so many flowers and the bulbs (technically pseudo-bulbs) not bulking up so prolifically as in the past. I couldn't decide if the problem was compost, warmer winters, the sphagnum moss (from a different source and with perhaps more insects and weeds in it) or the greenhouse shading (we'd had to replace our blinds and the new green mesh was heavier and darker so we returned to a lighter shading).

I should point out that it is illegal to collect sphagnum moss from the wild without the permission of the landowner. If you want to use sphagnum it is really better to grow your own on the surface of an orchid pot once you have established a colony. But read on !

ROCKWOOL DOES THE TRICK

In the meantime I had expanded my interest in growing orchids and the nursery I visited specialised in growing their tender orchids in rockwool and foam. So I followed their instructions, watering once a week, or when the plant was almost dry, with luke-warm water with a touch of orchid fertiliser and flushing through with clear water at every fourth watering.

The plants flourished and flowered well so I thought I would experiment with a pan of *Pleione* 'Shantung Ducat'. The results were equally as good if not better than growing in the natural compost, one bonus being no weeds and no beasties. Last year I potted a pan of true *P. forrestii* with one half of natural compost and the other half rockwool mix. The rockwool half performed the best.

This year I have tried more cultivars in the mix but now I put 20% Perlite into the rockwool/foam.

I bought a ready-potted pleione this spring and when I repotted it I found the compost was chopped beech leaves and Perlite; the bulbs were in excellent condition.

REPOTTING

I repot in February, using shallow pans ie 8in saucers which are about 2 to 3 in deep . These need a lot of drainage holes drilled or melted with a soldering iron.

I put a layer of expanded polystyrene chips in the base for drainage, then a layer of the rockwool/ foam/Perlite. I cut away the old roots of the bulbs being repotted and space the bulbs out on the compost. The I put a layer of granite chippings on top. Before putting them on the bench I give a fine brief spray, since the compost they have left was not bone dry. If the compost is too dry at this time the already developed flower shoots may shrivel. This didn't seem to happen in our colder winters but it can happen as the temperatures rise.

I keep these saucers on trays of damp pebbles which keeps the humidity up and again helps to prevent shrivelling. We keep our greenhouse frost free at a minimum of +5°C.

WATER AND FERTILISER

It is wise to be very careful with watering as the plants start into growth; the occasional fine spray is perhaps enough. When the plants are in full leaf, water liberally so that the water runs through the pot but be sparing with the fertiliser and rinse with plain water at least once a month to remove any residual salts which might burn the roots. In August I use a high potassium fertiliser at less than half recommended strength to promote flower bud growth. I place the pans in full light during autumn to ripen the bulbs. When the leaves drop, stop watering.

composts

My conclusion is that pleiones will grow in a wide range of composts as long as they have free drainage.

The book "The Genus Pleione" by Phillip Cribb and Ian Butterfield (Royal Botanic Gardens, Kew in association with Christopher Helm and Timber Press 1988) has been found to be very useful.

Three snowdrops

Evelyn Stevens

This is a preliminary note to name three snowdrops. They are :-

1. *Galanthus plicatus* 'Sophie North', a fine form with large flowers and very wide leaves
2. *G. plicatus* 'Sybil Roberta', a tall graceful form, with neatly double flowers and very glaucous leaves
3. *G. nivalis* 'The Linns', late flowering, tall, erect and with large distinctive flowers

All are vigorous and are excellent garden plants. Full accounts will be given in the next two issues of The Rock garden

AUTUMN GENTIANS

Part 2: Their propagation, cultivation and place in the garden

by I. H. McNAUGHTON

VEGETATIVE PROPAGATION

Vegetative propagation is usually by rooted offsets, normally called thongs. Plants are lifted from the open ground (or taken from pots) and the thongs separated out, just as growth is beginning in February or March. It is beneficial for open-ground plants to be lifted and divided from time to time as congested plants flower less freely; RBG do this with their gentian beds every three or four years. Varieties vary greatly in their ability to produce thongs; some are prolific, for example various forms of *G.* x *macaulayi* while others produce very few. The true 'Inverleith' is a vigorous plant but it is slow to multiply by thongs, each plant producing as few as two or three in a year's growth. Because of this, Jack Drake's Nursery used to charge double the normal gentian price for 'Inverleith'; most customers thought it was worth the the premium.

Certain cultivars root readily from stem nodes, rather like strawberry runners and multiply rapidly by layering. Some forms of *G. sino-ornata* and *G.*x *macaulayi* do this. 'Cairngorm', introduced by Ian Christie, was selected for its ease of propagation by this method.

Varieties slow to propagate by thongs or runners can be multiplied by taking shoot-tip cuttings 2-3cm long in April-May, just as the stems are beginning to elongate. Cuttings may be treated with a hormone rooting agent but this is not usually necessary and, some say, even inhibits rooting. Cuttings are inserted in a peat:sand or peat:vermiculite medium and placed in a relatively cool, shaded spot where they should root in three or four weeks. Mist propagation is beneficial in speeding up rooting but, if used, careful weaning is necessary.

In a nursery frame, vigorous clones with trailing stems can easily spread and root into adjacent pots; this may well be a factor leading to unintentional wrong naming of cultivars. Seed may sometimes

be shed within a pot with similar consequences. Known seedlings should not be given the same name as their seed parent.

There is no excuse, of course, for deliberate wrong naming or substitution of a cloned cultivar by inferior forms that are easier to propagate as has happened with 'Inverleith', a cultivar listed in the Plant Finder as available from 12 UK nurseries or garden centres; few, if any, are likely to be offering the authentic plant. Twenty one sources of 'Kingfisher' are listed but this is another cultivar with many inferior masqueraders. The true 'Kingfisher' is aptly named and is distinctive in having striking reddish pollen.

Even vegetative (clonal) propagation will not maintain the identity, ie exactly reproduce, a somatic variant such as 'Angels Wings'. Discovered at Jack Drake's as a sport of *G. sino-ornata*, this cultivar is basically white-flowered with stripes or streaks of dark blue. The degree of blue colouration can vary considerably between plants and even between flowers on the same plant. Such unstable variation is almost certainly due to a chimera. A white-flowered form, named 'White Wings' has been selected as a cutting from 'Angels Wings' but it does not reproduce true to type in my experience. These aberrant forms are disliked by most gentian conoisseurs but, surprisingly, are quite popular with the buying public.

Some bicolour forms can be attractive. 'Edith Sarah', deep blue with distinctive large starry markings is a good cultivar. The less well known 'Delft', raised by H. Fuchs in Germany, has whitish flowers fringed by pale lilac; it is illustrated by Köhlein (1991). This unusual and attractive gentian is said to be rather weak and difficult to grow; it is probably not yet available in the UK. Both these cultivars seem to be stable and can be reproduced by thongs or cuttings but there are indications that 'Edith Sarah' may be losing vigour due to continuous vegetative propagation.

PROPAGATION BY SEED

Some named gentians are maintained by seed only, the correct name being a strain. Probably the best known is 'Drakes Strain' produced at Inshriach Nursery from 'Farorna' (of *G. farreri* x *G. ornata* parentage). Plants of 'Drakes Strain' are pale blue with white markings within the corolla tube, neat, compact and early flowering. There is some variation which is,of course, typical of a strain.

The genetic constitution of a strain is likely to vary as it is multiplied. Ideally this variation should be kept within defined limits by isolating mother plants, selected as being typical, from other gentians. This is not normally practicable and most strains are multiplied in the corner of the nursery or garden, sometimes adjacent to other varieties. The inevitable cross-pollination sometimes results in interesting new plants, for example, white-flowered plants of 'Drakes Strain' crop up from time to time.

Because any strain is likely to be genetically heterozygous, ie have inbuilt variability, even self-pollination will result in variable offspring. Complete isolation of a strain for seed production may reduce variation but will not eliminate it.

A particularly good seedling from a strain could, of course, be given a cultivar name. It would then need to be propagated vegetatively to maintain its identity. Such a procedure is well exemplified by a seedling of 'Devonhall Strain' purchased from Maryfield Nurseries by the late John Aitken of Dyce, a well-known amateur enthusiast. This plant was propagated vegetatively and distributed; it was known for many years as 'Devonhall Seedling', subsequently re-named 'Blue Bonnets'. It is a fine cultivar with attractively marked pale blue flowers, one of my favourites.

Other strains of fairly recent origin are 'Tweeddale Strain', developed at Edrom Nursery; 'Cambrian Strain' and 'Cambrian Strain White', raised at Aberconwy Nursery by Keith Lever and 'Glamis Strain' from Ian Christie's Nursery at Westmuir. These strains have complex and sometimes only partially known parentages.

The concept of strains is not to be deplored and I recommend all the strains mentioned above as worth growing and it is always exciting to discover the occasional unusual plant.

It is often difficult to obtain seed from autumn-flowering gentians in the garden. There is little doubt that some cultivars and hybrids are genetically sterile and incapable of producing seed under any conditions. Poor seed setting may, however, be due to a lack of insect pollinators. A major cause of failure is that seed capsules easily rot in damp conditions such as those encountered in a typical Scottish autumn. To assist capsule drying and seed ripening, petals and sepals should be peeled right down or right off. This prevents water-logging and allows air to circulate around the ripening capsules. Insects, particularly earwigs, can reap havoc with gentian capsules, frustratingly just when the seed is almost ripe.

Capsules may sometimes be extruded above and beyond the fading and soggy corolla, thus aiding seed ripening. This phenomenon seems to be a characteristic of certain varieties, but is also influenced by season. Some species, eg *G. hexaphylla, G. ornata* and *G. prolata*, show capsule extrusion in their natural habitats, thus probably aiding their survival and distribution.

I normally grow plants, selected for deliberate hand pollination in pots in a cool greenhouse. Occasionally I have taken pollen from plants grown out in the garden. The female parent is prepared by slitting open large buds and removing the stamens with forceps. The plant is then covered to keep off unwanted insects until the stigmas have recoiled and become receptive. Pollen from newly dehisced anthers of the selected male parent is applied by a paint brush or using forceps. It is important to sterilise these implements between different pollinations. I use a hand lens to check that the pollen has been properly applied. Pollinated flowers are tagged (differently coloured quick-ties are useful) and details of the parentage and date recorded. The female is again covered for about a week until the capsules begin to ripen.

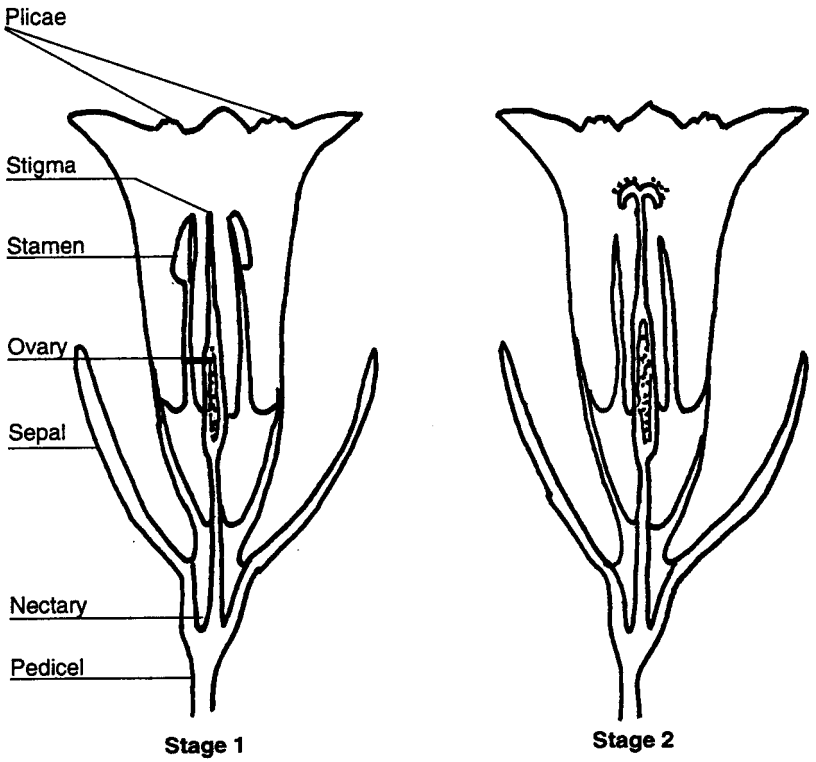
Given the right conditions seed ripens quickly, ie in two or three weeks. Seed can either be sown immediately, as advocated by Wilkie (1936) or kept in paper envelopes until early spring. I have had excellent results from sowing in early January which should produce seedlings ready for pricking out in May or June.

It is important to use an ericaceous compost for seed sowing, with added grit to give good drainage. Seed is sown on the surface and just covered by fine grit. Darkness is said to be a requirement but, in my experience, normal daylight is not detrimental to good germination. Vernalisation is necessary to initiate germination; seed pans should be kept outdoors or in a cold frame so that frost can act on the seeds. Obviously they must be kept damp.

It is best to cover the seed pans with glass or perspex and to water them from below. When large enough to handle, seedlings are transferred to larger deeper pots. I use 9cm square pots, each taking five or six seedlings. A widger is an ideal tool for transferring seedlings which have long delicate roots. When well established with several leaves, young plants are given individual 9cm pots.

From seed sown in early spring most plants will flower in the autumn of the following year, a few perhaps not until the year after.

The Gentian Flower



When seedlings flower for the first time, characters such as flower colour are obvious but not growth habit. Many plants can be discarded at this stage with a few being selected for growing on. Growing in the open ground is important for at least one season, preferably longer, to assess garden merit. From the initial cross to this stage takes at least four or five years, so patience is needed.

A potential new cultivar should be distinct, uniform and stable, (DUS) for short, in order to be officially recognised. If a new cultivar has been proved to be DUSit is eligible for Plant Variety Rights (PVR) and the breeder can collect royalties each time it is propagated for sale. This applies to all plants, horticultural or agricultural. Legislation exists for many plants from roses to potatoes, but there is none as yet for gentians. If two cultivars are indistinguishable, or very similar, the one that was first named is the only valid one. A name given to a new cultivar must be unique and should be unambiguous, at least within the particular group of plants. I was a bit taken aback recently to see in a nursery a gentian called 'Heavenly Blue'. There is already a 'Blue Heaven' (one of Drake's) and there is *Lithodora* 'Heavenly Blue'. When I commented on this, the offending label was hastily removed. A good way for a new cultivar to gain recognition is for it to be submitted for an award by the RHS Rock Garden Plant Committee. It is not necessary for the breeder to do this, neither is it normal practice.

GENTIANS IN THE GARDEN, PLANT ASSOCIATIONS

All the species mentioned in this article occur at high altitude in their natural habitats, generally between 3000 and 5000m. Precise habitat can vary; *G. ornata*, as previously mentioned, is usually found growing in wet, boggy conditions, sometimes even in standing water. Other species occupy drier areas. For example, *G. veitchiorum* is commonly found in relatively dry grassland turf which may sometimes be grazed. It is, of course, difficult or impossible to recreate most of the natural habitat conditions in the garden; many of the plants we grow are hybrids anyway; sensible compromises have to be reached.

CULTIVATION

In the garden, autumn gentians do best in an open or lightly shaded situation. They grow poorly and soon become chlorotic in soils containing limestone (calcium carbonate) but dolomitic

limestone (calcium magnesium carbonate) is tolerated in small quantities and as it is a normal constituent of gentian compost may be beneficial

Good drainage is highly desirable, as long as the plants are kept moist throughout the growing season. Berry (1951) recommends the incorporation of leaf mould or spent hops in soil preparation. A slow release fertiliser such as Osmocote or Vitax Q4 can be useful. Farmyard manure should not be used, neither should mushroom compost which contains lime. A high potash granular fertiliser can be applied with benefit in mid-summer prior to flowering. Alternatively a liquid fertiliser such as Tomorite can be watered on at half strength from time to time.

Small growing, less vigorous forms such as *G. hexaphylla*, *G. ornata* and 'Glendevon' are probably best confined to a trough which should contain ericaceous compost with added grit for improved drainage. Jim Jermyn advocates growing *G. farreri* in a trough as it seems to be ephemeral when grown out in the peat bed; this method has proved successful for him at Edrom. Plants of *G. veitchiorum*, collected by recent expeditions, are generally small and not very robust. At the RBG, Edinburgh most are being grown in stone troughs rather than put at risk out in the open ground

Gentians die back to a basal rosette in the winter, leaving dead flowers and foliage. This can be unsightly; such debris can be removed in the late autumn but it is probably more convenient to tidy it away in early spring when the plants are normally lifted and divided.

I prefer to see gentians associated with other plants rather than in pure beds; this, after all, is more akin to the natural situation. Dwarf conifers, for example the smaller forms of *Pinus mugo* and *Chamaecyparis obtusa*, are very suitable as a background. Slow growing, spreading junipers can be used effectively between the different gentian cultivars, also serving to separate them. Dwarf and prostrate rhododendrons can, of course, be useful as well as other small shrubs such as the pink *Hebe* 'Rosie' or the grey-leaved *Brachyglottis* (*Senecio*) *spedenii.*

Celmisias like the same peaty conditions as gentians and those with silver leaves can be especially effective foils. *Calluna*, including the coloured foliage types, can look good all year round, if judiciously pruned, and associate well with gentians. A double flowered white, such as 'Kinlochruel', can be particularly effective.

The various forms of *Cyclamen hederifolium* flower over the same period, those with marbled leaves being especially attractive. In our garden, an association of *Arum italicum pictum,* with marbled leaves and spikes of bright orange-red berries, formed a particularly effective association last autumn with *G.* x *macaulayii* 'Kidbrooke Seedling'. Among plants that flower at a different time, *Lithodora diffusa* 'Picos' is useful, being a compact grower. It is more suitable than *L.*'Heavenly Blue' or *L.*'Grace Ward' which are too invasive and soon become straggly.

Since the autumn gentians are virtually dormant in early spring, this is a time when a bed can be uninteresting. Dwarf bulbs can be used to brighten things up. Small growing daffodils such as 'February Gold', 'Tête-a-Tête' or 'Jumblie' are about the right size while the somewhat taller 'Thalia' is excellent. Species crocuses such as *C. tommasinanius* or *C. vernus* can be allowed to self-sow and multiply. Foliage from the bulbs will die back and can be tidied up well before the gentians begin to flower. *Geranium sessiliflorum nigricans* self-seeded into our gentian bed where it formed a very attractive association of russet foliage with the pale blue gentian 'Leslie Delaney'. These are just a few suggested plant associations.

Forms with long trailing stems, sometimes referred to as 'climbing' gentians, look very untidy in pots and would not find favour in plant sales areas. They do, however, have a place in the garden and can be effective scrambling through twiggy shrubs. *G.* x *macaulayii* 'Brin Form', sometimes assigned to *G. sino-ornata*, is a trailing form raised in the 1950's by Dick Trotter at Brin House Nursery, Farr, near Inverness. *G.* x *macaulayii* 'Elata' is similar and may have been a sister seedling.

Autumn gentians do not take kindly to pot culture and winter losses can be severe. Main causes are water-logging and freezing resulting in rotting of the roots. Losses can be reduced to some extent by the addition of coarse grit and/or the use of crocks to improve drainage and by covering with glass or over-wintering in cold frames. Ian Christie has observed that losses due to waterlogging seem to be linked to the genetic origin of the plants concerned, an interesting comment in view of the wet or dry natural habitats of some of the species.

FLOWERING

The opening of flowers seems to be influenced by temperature; most close up when this drops. The flowers of a few cultivars

remain open under adverse conditions, an obvious plus point. 'Royal Highlander' is a good example.

G. x *carolii* is always one of the first to flower here in East Lothian; it flowers sporadically over a long period commencing about mid-July and continues until November. *G. prolata* usually starts to flower in early August but flowers for a relatively short time. *G* .x *macaulayii* 'Praecox', as the name implies, is the earliset to flower of that species.

It is my impression that the paler coloured flowers normally flower earlier than the darker blues. There are, of course, exceptions; 'Strathmore' is an early dark blue while the pale blue 'Cairngorm' can brighten up a gentian bed in October and November. In general the *sino-ornata* forms are the latest to flower, sometimes continuing well into December.

Some gentians are especially floriferous, notably the multi-headed forms which can have several to many flowers on each stem. One of these is *G.* x *multiflora,* aptly named and raised by David Tuckwell who once owned Woodside Alpines near Forres, Nairn. He obtained this fine plant from a cross, or back-cross to be precise, between *G.* x *stevenagensis* and *G. veitchiorum*; like its parents it is dark blue tinged with purple. There is reputed to be a pale blue form but I have not seen it. *G.* x *multiflora* has given rise to other multi-headed types, eg 'Kirriemuir' recently released by Christies Nursery.

There are so many shades and blends of flowers colour that accurate descriptions can be virtually impossible. Berry (1951) made use of the RHS Colour Chart; this is useful up to a point but few people are likley to possess a chart for reference.

Autumn gentians used to be sold in large numbers as cut flowers but this trade has now died out. They make attractive table decorations; flowers can last in the house for up to a fortnight. Varieties with tall stems such as *G.* x *macaulayii* 'Elata', *G. sino-ornata* types or 'Elizabeth' are useful for this purpose, either on their own or perhaps along with white heather (*Calluna*) or with some form of silver-grey foliage. 'Edith Sarah' with its large good blue flowers and conspicuous white markings is particularly effective as a cut flower.

PHOTOGRAPHY

It is not easy to obtain satisfactory colour photographs of autumn gentians; shades of blue are notoriously difficult to portray

accurately. An 82A filter is recommended for enhancement of blue colour; it is said to 'correct excess reddish cast' and to give 'cool natural colour'. Slight under-exposure, ie by half a stop, could improve results but it may be necessary to experiment with a range of exposures. Bright sunlight should be avoided. Overcast conditions give better results, even if longer exposures are required. For improved sharpness, a tripod and cable release are recommended.

PESTS AND DISEASES

It is not intended to deal with pests and diseases in this article as these subjects are adequately covered elsewhere, particularly by Bartlett (1975) and by Köhlein (1991). Attention should , however, be drawn to a new and potentially serious disease affecting gentians. In 1989/1990 severe loss of gentians occurred in certain nurseries due to a hitherto unknown fungal disease causing root rot; The pathogen was later identified as a new species of *Phoma*, *P. gentianae-sino-ornatae* sp. nov. (Punithalingam, E. and Harling, R. 1993). The disease was inadvertently encouraged to develop by a production system that involved copious overhead watering of potted plants in hot, dry weather and by excessive feeding.

This article began with the discovery of species in the wild and their introduction into cultivation. It is perhaps appropriate to end on the same theme. China, which now includes Tibet (re-named Xizang) is undoubtedly the main home of the autumn gentians. Recent improvement in the world political situation means that China is much easier, and less restricted, to visit. The Flora of China is being re-written; this will almost certainly have repercussions on the naming of gentian species. Further cyto-taxonomic investigations are necessary to elucidate species relationships; such studies are currently being carried out by Chinese scientists.

Species new to science and/or new to cultivation have recently been found and some will, no doubt, find their into gardens. *G. caelestis* (Marquand) H. Sm., collected in Yunnan by the CLD Expedition in 1990 and described by Christie (1995) is one of these. It flowered for probably the first time in cultivation at the RBG, Edinburgh in 1994 and is already available from a few specialist nurseries. *G. caelestis* is a plant with neat foliage, comprised of very short leaves. The flowers are pale blue and

stubby, rather reminiscent of *G. ornata*, which as it happens, was the very first species to be discovered back in 1820.

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ACKNOWLEDGEMENTS

I am grateful to Dr Dennis Graham, Jim Jermyn and Ron Mc Beath for constructive comments, also to Ian Christie for useful information. Thanks are also due to Dr Alan Dickinson for advice on photography.

OBITUARY

Neil Lyle died in December 1995, aged 89. He was an avid gentian enthusiast and raised a number of excellent cultivars at Maryfield Nurseries, Leslie in Fife. They are a tribute to his skill as a plantsman and to his eye for a good plant. He was also a great connoisseur of orchids and had a particularly fine collectiion of pleiones. Neil will be remembered by the many SRGC members who visited his interesting nursery over the years.

ERRATA

A number of errors crept into Part 1 of this article which are now corrected below.

p.352 'Duguid Strain' should read 'Duguid Clone'

Figs. 75 and 76 should be attributed to the RBG, Edinburgh

p.354 at foot of penultimate paragraph the phrase 'who will endeavour to back him in this venture' should be omitted.

Seedlings of *G. sino-ornata*

Cultivar	Raiser
'Alba'	
'Angels Wings'	J. Drake
'Leslie Delavey'	R.N.C. (Bud) Lyle
'Marion Lyle'	do.
'Mary Lyle'	do.
'Edith Sarah'	C. Wood
'Downfield'	I. Christie
'White Wings'	do.
(Selection from 'Angels Wings')	
'Woolgreaves Form'	

Seedlings of *G. veitchiorum*

Cultivar	Raiser
'Barbara Lyle'	N.C. Lyle
'Blauer Grotte'	J. Eschmann, Switzerland
'Blauer Gnom'	do.
'Opal'	do.
'Saphir'	do.
'Starlight'	do.
'White Form'	
'Blue Heaven'	J. Drake

Seedlings of *G.* x *macaulayi* (*G. sino-ornata* x *G. farreri*)

Cultivar	Raiser
'Admiral'	J. Eschmann, Switzerland
'Brin Form'	D. Trotter
'Elata'	D. Trotter
'Elizabeth Brand'	Col. J. Stitt
'Praecox'	D. Trotter ?
*'Kidbrooke Seedling'	
*'Kingfisher'	J. Drake
*Parents of Inshriach Hybrids	

Seedlings of Inverleith (*G. farreri* x *G. veitchiorum*)

Cultivar	Raiser
'Blue Flame'	J. Drake
'Inverleith Seedling'	do.
'Susan Jane'	do.
'Christine Jean'	Col. J. Stitt
'Midnight'	do.
'Blauer Dom'	J. Eschmann, Switzerland
'Blue King'	do.
'Lucerna'	do.
'Nibelungen'	do.
'Zauberland'	do.
'Queen of the Blues'	Edrom Nursery
'The Souter'	do.

Inter-species hybrids with *G. farreri* as a parent

Hybrid	Parentage
G. macaulayi	*G. sino-ornata x G. farreri*
G. x carolii	*G. farreri x G. lawrencei*
G. x hexa-farreri	*G. hexaphylla x G. farreri*
'Inverleith'	*G. farreri x G. veitchiorum*
'Farorna'	*G. farreri x G. ornata*

Introduction of Asiatic Gentian Species

Species	Discoverer	Date	Area found	Endemic to other areas	Date in cultivation	Date of award
G. ornata	N. Wallich	1820	Nepal	Bhutan, Sikkim, *Tibet	1930	
G. ternifolia	P. Delavey	1882	Yunnan		1981	
G. sino-ornata	G. Forrest	1904	N.W. Yunnan	Tibet	1909	AM 1916
G. oreodoxa	G. Forrest ?	?	Mid Yunnan	Assam, Burma, Tibet		
G. lawrencei	J. Brocheral	1905	Mongolia	Siberia		
G. veitchiorum	E. Wilson	1905	Szechwan	Tibet, Yunnan		AM 1909
G. farreri	R. Farrer, W. Purdom	1914	N. Kansu	Tibet	1916	FCC 1919
G. hexaphylla	R. Farrer, W. Purdom	1914	N. Kansu	Tibet, Yunnan	1916	AM 1929
G. prolata	R.E. Cooper	1914	Bhutan	Nepal, Sikkim	1917	AM 1929

*now Xizang

Distribution Map for Autumn Gentian Species

THE WRONG THING AT THE WRONG TIME

On 20 December 1995, I watered the in-growth bulbs in my greenhouse, mainly narcissi, as the following day I was going south for 10 days to spend Christmas with my sons.

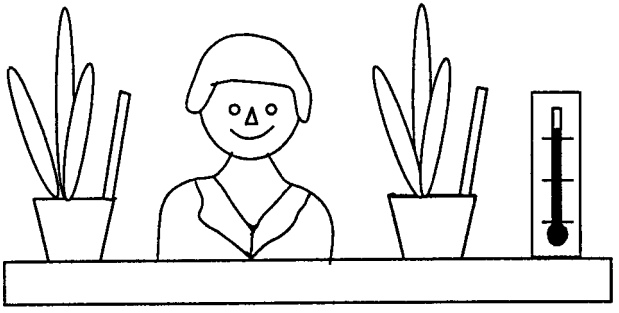
Overnight the temperature dropped sharply , though I only realised by how much when I found there were no hot drinks available on the bus until after Beatock, as the water pipe supplying the boiler was frozen solid.

It was not a particularly warm Christmas in Macclesfield but Aberdeen was far colder. The temperature there remained at, or below, freezing all the time I was away except when it snowed. My greenhouse plunges were frozen for most of this time. I returned as it started to thaw.

At first, things did not look too bad. Later, however, the flower buds aborted and the foliage started to die back. By the middle of February I could pick the foliage off the surface of the pots and when I investigated further I found the bulbs were just mush. I have now thrown out most of my collection of dwarf narcissi. However, I like them so much and their cheer factor in winter is something I value so I intend to start again. A heating cable for the top plunge, to keep it just frost free, has gone on my birthday list.

The bulbs will take longer to be replaced.

Helen Greenwood



EAS

The Rock Garden Month by Month
by Michael Jefferson-Brown and Michael Upward
Published by David and Charles
144 pages 65 colour plates plus colour and black and white drawings
Price £15.99

The Month by Month layout provides a sensibly disciplined approach for the general gardener wishing to begin a progressive move to growing alpine plants. Scottish readers will wish to add two to four weeks to some of the suggested average dates. The monthly checklists of tasks offer a means of reminding the newcomer to alpine gardening of the jobs to be done, thus avoiding the "now I shall have to wait until next year" syndrome.

The Plants of the Month suggest an interesting and diverse range from which to build up a rock garden. From the experience of these plants the newcomer can later select those that do best in their location offering the chance to specialise and develop further their expertise.

The Practical Projects include most of the construction activities from raised beds to alpine pavements including advice on renovating an old rock garden, which for many gardeners will trigger their interest in alpines. The key purposes and requirements for alpine houses and frames are also covered.

The colour photographs and the many diagrams maintain the interest and are of good quality (with the one exception of the *Gentiana sino-ornata* plate on pp 108-9 which admittedly they do describe as a deep blue blur!) The content is generally both practical and reliable. The optimism of the drawing depicting D*ionysia aretoides* growing outside in a raised bed on page 17 is fortunately countered by page 23 which recommends potting in well drained grit in an alpine house. But this one minor point does not stop a recommendation of this book as the base text providing sound advice to those gardeners joining us in the pleasures of rock gardening. NK

Dr Alfred Evans

We are delighted to hear that Alfred Evans, a Past President and an Honorary Vice-President of our Club has been awarded the Victoria Medal of Honour by the Royal Horticultural Society, its highest honour.

This Medal is awarded by the RHS to British horticulturists resident in the UK whom Council considers deserving of special honour at the hands of the Society .

Alfred joins Professor Douglas Henderson and Mr Jack Drake as members of our Club who have been awarded the VMH.

ANNUAL GENERAL MEETING

The Annual General Meeting
will be held at the
Battleby Conference Centre
Redgorton, Perth
on Saturday 2 November 1996 at 2.00 pm

Isobel J Simpson

With the death of Isobel Simpson on 12 January 196 after a long illness, borne with courage and fortitude, supported by her family and her husband David, the Club has lost a faithful servant and friend. Between them, Isobel and David contributed a life time of devoted service to the SRGC.

As Club Librarians for 16 years, Isobel and David started circulating a list of books and introduced the Group Loan Scheme whereby each group receives a quota of books during the winter months. They were also responsible for introducing their skills in computer technology to the Library list and for initiating the collection of subscription by Giro and the recording of membership by computer.

Isobel served on Council and as Club Secretary from 1975 to 1982. With her methodical mind and her kind, gentle and understanding personality she steered the Club through a period of change in the management and running of an ever increasing membership. At this time, Isobel introduced the Secretary's Page which informs members of news items and events.

Isobel carried out her duties with her infectious laugh and smile. A talented painter and with an eye for a good photograph, Isobel started and for many years organised the Twice Yearly Competition for art and photography.

It was fitting that in 1988, Isobel was awarded the Golden Jubilee Salver as a well-deserved tribute for the time and effort which Isobel had unselfishly devoted to Club affairs. Also at this time, a Gold Medal was awarded at the Glasgow Garden Festival for her wonderful display of members' photographs and paintings.

Isobel loved flowers and natural history from an early age and her involvement and commitment were far-reaching. A founder member of the Edinburgh University Garden Club and founder of the Edinburgh Grange District Garden Club, she was known as the 'Tree Lady' from her interest in tree conservation. All trees visible from the highway were listed, species identified and locations noted. Woe betide anyone who attempted to cut down a tree!

Isobel was an active member of the Scottish Chapter of the Americam Rhododendron Society, a member of the NCCPG and a member of the Garden History Society. Many members' gardens and the Church Rectory hold plant treasures that were gifts from isobel.

In 1993 Isobel was made an Honorary Vice-President for her outstanding contribution to the Club.

We are all saddened by her passing but are blessed by our memories of this wonderful lady.

J H A Milne

ADVANCE NOTIFICATION

DISCUSSION WEEKEND 1997

The Discussion Weekend in autumn 1997 will be held in the

Stakis Tree Tops Hotel in Aberdeen

The Tree Tops is a luxury hotel situated in a residential area 15 min from the City Centre with twin and double rooms and colour TV. Full bar and restaurant facilities. Swimming pool, sauna, gym, solarium, whirlpool spa

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Wild Alpine seeds personally collected from Caucasus, Carpathians, Alps, Balkans and Turkey. Catalogue US$2, cash only.
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DISCUSSION WEEKEND

13-15 September 1996

The Discussion Weekend will be held in the Kelvin Conference Centre, West of Scotland Science Park, Maryhill Road, Glasgow G20 0TH

Friday 13 Sept

Evening Lecture: Jack Brownless– Food for Thought
followed by Dwarf Bulb Group Meeting

Saturday 14 Sept

9am -12	Visit to the Burrell Collection or Workshops:Growing tips, Troughs
12 noon	Show Opens
2.30pm	William Buchanan Memorial Lecture David Harberd– Pleiones and their Cultivation
4.15pm	David Paterson– Woody Plants Suitable for the Alpine Garden, in Cultivation and in the Wild
7.30pm	Conference Dinner

Sunday 15 Sept

9.45am	Ian Christie– Plant Propagation
11.30am	Chris Grey-Wilson– The Flowers of Greece and Crete
2.30pm	Harold Esslemont Lecture Chris Brickell– A Chinese Odyssey

Costs

RESIDENT: Friday Dinner – Sunday afternoon tea including Conference Dinner.....£115
Saturday lunch– Sunday afternoon tea.....87.50
Sunday dinner – Monday breakfast.....30

NON-RESIDENT: Saturday or Sunday day charge.....25
(morning coffee, lunch,afternoon tea)
Saturday evening Conference Dinner.....18

Please add a late booking fee of £5 if making payment after 31 May 1996. A cancellation charge of 15% will be levied up to 30 June, thereafter the charge will be 25%.

The number of delegates is limited to 150. Overnight accomodation may not be available after 1 July.

Bookings should be made on on the form in this issue of **The Rock Garden.** The booking, with the appropriate remittance made payable to the Scottish Rock Garden Club, should be sent to:

Mrs Anne Chambers, Suilven, Drumore Road, Killearn, Glasgow G63 9NX

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Please note that queries about the New Journal should be addressed to the Editor.

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39,52,55,58,60-64,66	50	0.85
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Index & Cumulative Index 20-69	265 (post paid)	4.50
Cumulative Index	150 (post paid)	2.55

Postal contribution 35p per Journal up to a maximum of £8.40 for UK members only. For overseas members the charges are 40p (70c) per Journal to a maximum of £9.60 ($16.30).

PAYMENT

Payment may be made by Sterling or US$ remittances- Cheques, Money Orders, Bank Drafts etc. made payable to SRGC Publications Account or through Giro No. 10 787 9808. Please note that this Giro Account number is **NOT** for subscriptions.

Early numbers of the Journal are now urgently required for the ever-growing waiting list and will be gratefully received as gifts to the Club or bought at half the above prices. Postage for either arrangement will be refunded.

BINDERS

Stocks of binders to hold four numbers of the Journal are available at £3 each, post paid.

Journals and binders are available from Mr T G Sprunt, 17 Claremont Drive, Bridge of Allan, Stirlingshire FKL9 4EE, Scotland, UK. Tel 01786 833607 (Evenings only)

Please note that all other books are available from:

Mr B Hammond, Wakefield Cottage, Thornton, Laurencekirk, AB30 1AY, Scotland