

THE ROCK GARDEN



THE JOURNAL OF THE SCOTTISH ROCK GARDEN CLUB

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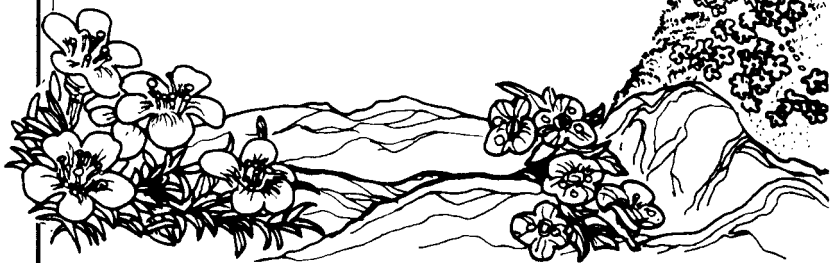
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Front cover:

Cypripedium calceolus (see p.82)

Photograph by R. Sullivan

Arthur Holman

The colour plates in this issue are dedicated to Arthur Holman whose life and contribution to the Club were recorded in the January issue of The Rock Garden.

From the sale of Arthur's plants at the Discussion Weekend and on various other Club occasions, the sum of £400 was raised and donated to the Colour Plate Appeal.

It is fitting that it has now been discovered that the missing Forrest Medal winner at the Discussion Weekend in 1984 was, in fact, Arthur Holman.

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Editorial

AWAY BACK in 1933 it was estimated that the known world supplies of oil would last for another 20 years and that it was unlikely that sufficient new fields could be found to supply the world's needs. How wrong that forecast was.

The same can be seen in the world of plant introductions. Right from the beginning of the AGS and the SRGC Journals you can read articles implying that all the best alpine plants had been discovered while, even at the end of the last century, plant collecting in the Far East was regarded as finished.

This edition of 'The Rock Garden' shows just what a wealth of new plant material is still awaiting appraisal in our gardens. There is perhaps rather a preponderance of articles dealing with travel in this issue but they do illustrate just how widespread are the plants we try to grow in our gardens.

We perhaps do not regard Israel as a place for alpines but the Norths have shown us just what a wealth of good plants there are. Not all that far away the Almonds remind us of the riches of Greece, particularly around Mount Olympus. Then we have Kashmir which we might think we know all about but Miss Walkden shows what can be seen by reading a few Floras and organising your own trip. Our own Exploration Fund provided some of the funds for George Kirkpatrick of the RBG Edinburgh to organise a trip to the high Himalayas where his party saw a great range of good plants.

On the other side of the world we have Richard Simpson showing us what a wide range of plants can be seen with a Skypass costing £190 and giving three weeks of unlimited travel throughout western Canada.

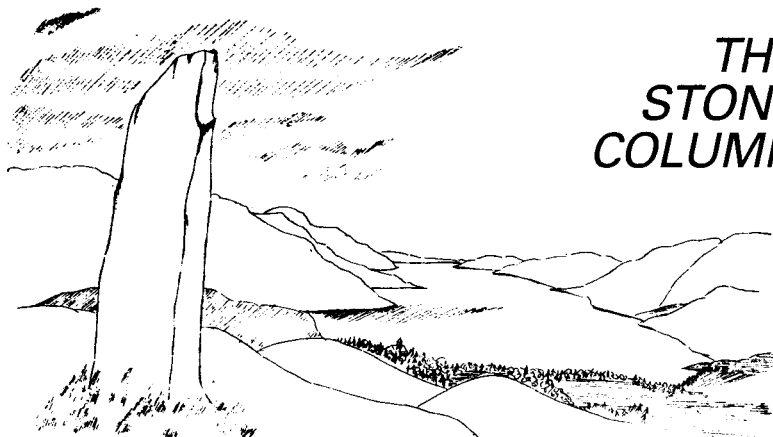
It is one thing to see so many wonderful plants on these trips, it is another thing to grow them successfully in our gardens. Perhaps surprisingly, plants from the Himalayas are often easier to grow than those from places nearer home such as the Mediterranean. It is no wonder, I suppose, that plants from New Zealand are by and large rather recalcitrant when one thinks of the huge differences in climate. Of the many beautiful species of *Ranunculus* described in this issue hardly any can be said to be truly in cultivation in the UK.

Perhaps help is at hand in the shape of one of our regular contributors to the 'Tomorrow's World' of gardening, Jim Cobb. He shows us how to evaluate sites in our gardens for growing particular plants but ends up with a cautionary note that perhaps we really need a phytotron to grow the intractable brutes that do nothing but pine away.

I hope that this gives some sort of flavour of the contents of this issue. Oh! I nearly forgot our resident columnists, the Stones who, bullied by the Editor, regularly come up with a feast of goodies to interest all tastes and, in this issue, do so once again.

ALASTAIR McKELVIE

THE STONE COLUMN



“Muckle Great Roses”

Gardens are rather like people, they pass through various stages in their life, youth, maturity, and old age. Judged on this scale our garden, here at Askival, is an unruly adolescent; at least there are many times when we feel like middle-aged parents trying to cope with a recalcitrant teenager. Like many analogies, this one shouldn't be stretched too far. Most gardens consist of divers parts, born at different times, and ageing at different rates. Unlike humans, gardens can have their various sections rejuvenated, by removing any plants no longer paying the rent, and reconstructing or reworking beds and borders.

Although our garden is a comparative youngster, with many areas as yet totally undeveloped, merely kept clear by Paraquat, some of the oldest beds have already passed the point of maturity and are starting to show their age. We described the reconstruction of one such in our last Column, triggered by the removal of overlarge “dwarf” conifers. On the surface it may appear that such rebuilding is in conflict with the development of new areas, like those in our upper garden, rival claimants for our limited time. In practice, however, the two can be dove-tailed together, to their mutual benefit; removal of worthwhile plants to the new provides elbow room for reworking the old. Generally the simplest approach is to repropagate the desirable plants, as it is much easier to dig out a mature specimen if one is going to discard it, and so isn't worried about damaging its roots. There are occasions when the time and effort expended in moving a large plant, like our *Abies balsamea hudsonii*, can be worthwhile. Such plants will give any new bed instant ageing, blending it in with the older parts of the garden.

We were confronted with the same dilemma again recently, but this time the compelling reason for the reconstruction was not ageing but change of use. Our oldest frames were built in 1977 on the site of what had been, since 1973, a formal rectangular lawn between the west side of the

house and the front boundary wall. The grass had originally been surrounded by borders roughly one metre wide containing shrub roses and spring bulbs, and these were left untouched for screening. As Poll's propagating increased, and further frames were required, they were sited to the south of the house on what was, in our original plan, the soft fruit garden, and separated from the older frameyard by one of the rose borders. Poll was never entirely happy with this latter border; lying to the south of the old frames it did cast valuable shade, but the frequent south-west winds scattered petals, hips and leaves at various times across the pots. Shade can always be provided by netting, so Poll's view prevailed and we determined to remove these roses, thus linking the two frame areas together. Far easier said than done: *Rosa moysii* had been in position since 1972 and had produced a dense thicket of stems nearly 3m tall; *Rosa glauca* formed an extensive patch of its lovely glaucous foliage, and three seedlings of *Rosa sericea chrysoarpa* raised from the late Len Beer's No. B 622 were now almost as large as the *R. moysii*. This form, while nothing special in flower, produces the most gorgeous elongated golden yellow hips, quite different from any other rose we have seen. All were on their own roots.

Roses are tough plants, they will even survive weeks in a plastic bag on a supermarket shelf, so we decided to try and move our large shrubs, rather than start again from cuttings. Up here we have found rose cuttings unreliable, even in the recommended month of September, and many take a long time to really get going, once rooted. Normally we only lightly prune our shrub roses, taking out the oldest, twiggiest pieces, every couple of years or so, but those to be moved were cut back severely by about threequarters, leaving the youngest most vigorous shoots, and even these were "topped" to reduce wind-rock after replanting. Since these roses have a widely ramifying but largely non-fibrous root system, they are not suitable for moving with balls of soil. Instead, I moled my way around and into the root-zone with a trowel, gradually removing the soil, cutting off any roots which ran down into the subsoil or too far sideways into neighbouring paths. There were moments during this laborious process when I expressed strongly to Poll my views on having to remove a perfectly good, thriving border, "Simply for more of your . . . frames". The resulting loose soil was moved across the garden and used to infill terracing on a slope near our last remaining larch tree. Its roots, and the thin soil cover, make any attempt at digging a bed here unrewarding. There is, of course, no point in leaving good soil under a frame; digging in this garden always produces masses of stones to refill such a space.

We ended up moving the roses as truncated burls, hopefully with roots and shoots sufficiently in balance for re-establishment. Barry Starling,

passing through, during his tour as travelling speaker to various groups, said they may well be rather late in leafing; so we could be in for a lengthy period of uncertainty.

The combination of smaller bulbs with deciduous shrubs is one that was strongly recommended by the late E. B. Anderson. As he pointed out the shrubs act as water pumps during the summer, their transpiration losses drying the soil while the bulbs are dormant. Not all deciduous shrubs are of course equally suitable, those of upright, or arching habit, wider at the top than base being the best. Ones of bushy rounded shape, with low branches to catch the bulb stems as they blow in the wind, are less well-adapted to the role. Once they are past the juvenile phase, many shrub and species roses throw up long canes, growing naturally into the desired vase shape. The least suited are roses of dense suckering habit, such as most of the gallicas. Many vigorous bulbs will survive in amongst these thickets, but the result to us is less than pleasing, carpets between shrubs is what we aim for.

Over the years the shrub rose and bulb plantings around the house and drive have proved to be a most successful low maintenance combination. Pearlworts were initially a problem, but these borders are left largely undisturbed to allow the bulbs to spread naturally. A top-dressing of peat also helps to reduce the weeding required. Although we do in general agree with James Cobb's comments in the last edition of *The Rock Garden* (p.455), peat mulches do have their place. As a garden entity, the peat bed is often built as a home for plants from two quite dissimilar habitats: woodlanders such as those he mentions, and the lowgrowing inhabitants of open moorland. This second group are not, in our experience, averse to peat; it's their natural substrate.

On our bulb areas, the peat covering eventually mosses over, after several years. Then, and only then, do the blackbirds show any interest in throwing it around. Presumably there are few slugs and snails in a sterile peat layer; once it turns mossy they colonise the area. We have even seen tree-creepers working over our moss-covered edging stones. Worms do not pull peat down as they do compost (from the heap), or leaf-mould, top-dressings, which rather bears out Dr Cobb's point about lack of feeding in peat and possible nutrient lock-up. This is not a problem on our rose borders: Poll feeds them generously twice a year with a high potash fertiliser. The one we use is SAI No.1 (15%N, 15%P, 21%K) an agricultural fertiliser intended for potatoes, and relatively cheap. The first feeding is given in late winter, as the early bulbs start to appear, the second as their flowers fade and the roses start to leaf out. It is worth reminding readers that our soil is stony and leaches rapidly; on heavier retentive soils, two feeds would probably be unnecessary. Many authorities assert that roses

also enjoy high potash fertiliser; certainly ours appear to thrive on it.

Our upper garden extension, fenced in during November 1983, slopes gently to the south-east and has open views across the Great Glen to the hills around the Corrieyairack Pass. So taken was one intrepid Himalayan traveller, that he was heard to remark "I'd like to pitch my tent up here!" When planning out this area, we wished to retain the views and feeling of open space, while at the same time masking the wire fence along the bottom. A formal hedge would look out of place in this wild setting and, in any case, its roots would rob any border in front. With friends offering rose cuttings, and species coming on from wild seed, a further rose border was clearly required, so to kill two birds . . . There are wild roses amongst the gorse bushes outside the fence so it blends in very well.

We have already described (Rock Garden No.77, p.328) previous stages in the progress of this border, as Poll dug her way along the fence each autumn. The dry October of 1986 was repeated in 1987, enabling her to complete the task; a strip generally 1.5m wide so it can be weeded from either side without standing on the soil. As we mentioned before there is a gap of 0.6m between border and fence for rear access. To avoid too linear a look, we incorporated a curved double width section, slightly off centre and on a gentle down slope, with stepping stones for weeding.

Apart from the roses from sources mentioned above and hopefully those moved from the extended frame area, we have bought in extra cultivars. Naturally these are budded onto rootstocks, so we plant them first in a temporary holding, or nursery, border. This enables us to assess their suitability for our garden conditions. Not all roses recommended by such rosarians as Graham Stuart Thomas, will perform well up here in the north. Some are simply effete southerners, and will not grow; others, particularly those with many petals, fail to open properly and/or retain their dead flowers as brown mouldering balls. Cuttings are taken from those which pass muster, so we do not have to worry about rootstock suckers in their permanent homes.

Many years ago on an early visit to Askival, Jim Sutherland wondered how long it would be before we threw out "those muckle great roses". If only he had seen the trouble taken in moving some of them to the upper territory. Like peat, they have their place in the larger garden.

Jardin D'Altitude du Haut Chitelet

We came across this splendid alpine garden last summer, quite by accident, on our way to the Alps. The first half of our journey from Zeebrugge to the Arlberg Pass followed an obvious virtual straight line to Luxembourg, but from here there is a choice of routes. Those addicted to motorways can continue via Strasbourg and on up the Rhine to pass south of Bodensee

(Lake Constance) on the Swiss network; or alternatively detour to the north, bypassing Stuttgart, and thence southwards to the east end of Bodensee. Since Grendel, our old landrover, had a low cruising speed we could not reach the Voralberg in one day, and chose to break our journey in France, somewhere in the Vosges. French cuisine had nothing to do with this decision, naturellement!

So it was we followed the Moselle south past Nancy to Épinal and thence up into the wooded hills to seek a night's lodging at a small "Logis". Next morning we drove up the D417 to the "Col de la Schlucht" intending to take a look at the Massif du Hohneck (1,361m). Thus, just short of the inevitable ski development on the summit, we turned right towards the massif onto the "Route des Cretes" (N430). We had travelled less than two kilometres from the Col, when a garden suddenly appeared on the right, downhill, side of the road, nestling in a break in the pinewoods. The words "Jardin d'altitude" on a sign caught our eye, so we stopped to investigate.

Although there was a botanic garden in this general area prior to the First World War, the present garden is of comparatively recent origin. The infrastructure was started in 1966 by young French and German volunteer gardeners, a tradition which continues to the present day; during our visit there were several students hard at work. First plantings took place in 1968 and the garden opened to the public a year later. It is run as an adjunct to the Nancy Botanic Garden, which itself is a joint venture between the City and University. Thus, we were told, finance is not a problem. At present these resources are in the capable hands of Jean-Paul Ferry, an enthusiastic and knowledgeable plantsman. Walking round, such an influence is obvious.

As befits a garden with University connections the principal purpose of Haute Chitelet is education in conservation. It is to be hoped that it will indeed help to instil in the public who visit, a need for the protection of wild plants and their habitats. With this aim in mind, the bulk of the plantings are arranged geographically. Naturally, pride of place is given to the plants of the Hautes Vosges itself: for example, there was a magnificent stand of *Gentiana lutea* within the garden and we also saw it coming into flower in open areas along the neighbouring roadsides. Although a second priority is given to the other alpine areas of France, with beds marked Jura, Massif Central, Pyrénées, Alpes occidentales etc., the rest of the world is not neglected. A patch of *Meconopsis betonicifolia* was in full flower beside a stream, the source of the river Vologne, along with such garden stalwarts as *Iris sibirica*. Is this the furthest south in Europe that blue poppies are grown successfully? Nearby in "North America", *Lewisia cotyledon* was bedded out in quantity, and a dwarf lupin from the Arctic was seeding itself around.

Perhaps of greater interest to us personally was a bed labelled “Sibérie”, because the plants were quite new to us. *Callianthemum angustifolium*, with brighter, more glaucous foliage than its European relatives, was unfortunately over, but the dwarf yellow *Iris bloudowii* was in full flower. Related to the Regelias it is placed in the small section, *Psammiris*. Alongside, *Pulsatilla bungeana* overtopped the very pretty foliage, and cream pea flowers of *Lathyrus gmelinii*. All these were thoroughly garden-worthy species one would like to see more widely grown.

There is, however, no doubt that the real backbone of Haute Chitelet is its collection of European alpiners. This is hardly surprising when one reads that the garden climate approaches that at 2,000m in the Alpes de Savoie, although it is somewhat lower at just over 1,200m. The rainfall is about 2,000mm per annum, but of greater significance is the fact that snow lies for over 150 days in the year, on average. In the propagation area, many fine plants are grown planted out in scree “frames”, edged with concrete blocks. No frame lights or shades were in evidence and when we asked, M. Ferry replied that in winter there was ample snow cover; in summer they were watered frequently “comme la nature”. There were many fine cushion plants, such as acantholimons, here, and our favourite auricula primulas were much in evidence. In one bed, *P. x forsteri* was used as ground cover, over an area 1m × 0.5m *Leucogenes leontopodium* had formed almost as large a mat on a small wall bed.

Returning to the main garden, in the “Pyrenees”, one bed contained two species only: a clump of *Lilium pyrenaicum* about 2m across and an edging all the way round of low, almost white, divided foliage. We were taken aback, to say the least, to read the label: *Senecio leucophyllus*. It was even spreading across the path and coming up on the other side! The only place we can keep it alive is under the overhang on the west side of our house. Walking a few steps to the Alps, the true *Campanula excisa*, with its intriguing cut-outs, had grown to over 1.5m in diameter, and there were equally large areas of *Leucanthemopsis alpina* and *Achillea oxyloba*, all looking very healthy. The two composites are sometimes confused when seen separately in the wild, M. Ferry’s plantings enabled us to fix their characters in our minds. Officially the achillea has divided cauline leaves, the leucanthemopsis only bracts, but when dwarfed, the former may not have evident stem leaves. Perhaps a better general distinction is the foliage colour: the achillea is a much brighter green.

It is something of a mystery to us how an alpine garden of this quality can have remained so little known in the United Kingdom. We can find no references to Haute Chitelet in the gardening literature. If one is passing anywhere near the Vosges, it is well worthwhile taking a short detour over the Col de la Schlucht, and seeing for oneself! The garden is open

every day from 1st June until 15th October. Conducted tours are available for parties on request; in which case there is far more to be gained if at least one member of the group can understand a little French.

Recent acquisitions

Diplarche multiflora McB. 1103

This small, heath-like shrub (Fig. 2, p. 14) has hovered around the edges of our gardening consciousness for quite some time. We first became aware of the presence in the Himalayas of a second woody member of the Diapensiaceae when the late Len Beer came to talk to the Inverness Group about his visits to Nepal. We did not take much notice of it at the time, a rather unspectacular pink flower lost amongst so many dramatic slides. Later, in correspondence with Barry Starling, a noted grower of Ericaceae and related plants, he mentioned that as far as he knew *Diplarche* had never been successfully raised in this country. Such challenges are not to be ignored, and our chance to take it up came late in 1981 when we received seed under Ron McBeath's number 1103. Sown straight away in December, germination was fitful and subsequent growth very slow, so they stayed in their pan for two seasons. Poll eventually pricked out eleven seedlings, as a part tray, along with choice slow-growing Ericaceae.

The summer of 1984 was a terrible trial for these monsoon-loving seedlings, as our garden experienced unusual heat and drought. One after another they turned yellow until we had only four survivors. These were potted individually the next spring, 1985, into 3-inch plastic pots, using a peat-sand compost, and were moved on again the following two years. By the end of 1986, they had formed little bushes 10-15cm high, the upright stems clothed all round in sessile leaves about 6mm long by 1mm wide. In effect they looked somewhat like *Phyllodoce nipponica*, but of a brighter, glossier green. Towards the end of the major stems, the leaves broadened and a prominent globular terminal bud formed. We felt sure this meant future flowers, but Ron, who saw them that autumn, remained teasingly unconvinced.

Our optimism was rewarded the following May, when clusters of small, pink flowers opened. They looked a little like a pink, larger-flowered *Leiophyllum buxifolium*, which some botanists think should be Diapensiaceae. Seed ripened very rapidly, presenting us with a problem: to sow or not. Most was sown fresh, and germinated immediately. Now we have to get the tiny seedlings through their first winter. *Diplarche multiflora* will probably always be a collector's item, but a very pretty one nonetheless.

Lilium lophorophorum H. 23

Two years ago we wrote a survey of the various members of the *Lilium nanum* complex which we then had in cultivation (Rock Garden No. 77, Page 332). In it we mentioned *Lilium lophorophorum*, which at the time was only known to us from the black-and-white photograph in Sampson Clay (plate 30). We were quite oblivious to the fact that the plant was already growing at Askival, under the label *Fritillaria* sp. H23. The seed had been offered in the SRGC exchange 1983/84, contributed by Robin Hatch from his collection in the Segunian Alps.

Five seeds germinated the next spring, and were pricked out a year later into a single larger pot. We find these smaller lilies do better in concert than if potted singly; and they were moved on again into a 7-inch square pot a year later. *Lilium nanum* itself would have been planted out at this stage, but these were rather more special. One of the plants flowered in the early summer of 1987, and was instantly recognisable.

The flowering plant (Fig.1, p.13) was about 15cm high, but may well be taller when fully mature. The foliage is broader than *Lilium nanum* and does not overtop the nodding canary-yellow flower. The lanceolate segments are about 6.5cm long with unusual acuminate tips. As the flower opens, these tips adhere for some time, the whole thing looking like a tiny Chinese lantern with open sides. Later, after they separate, the tips remain relaxed like claws. The small seedpod rotates upwards as it matures, and can easily be mistaken for a fritillary.

There remain three other plants in this group which we don't yet grow; perhaps mentioning them in the Column will work the magic again. The narrow-leaved *Lilium euxanthum* (true yellow) is very near *Lilium nanum*, but with golden yellow flowers, apparently spotted purple. The two others, *LL. soulei* and *georgii* are very fritillaria-like, the former with rich maroon purple flowers, glossy outside, the latter more blue-purple, matt outside and, it is said, rather more crowded leaves. We believe that *L. soulei* may now be in cultivation at RBG Edinburgh, but have no news of the others.

Rhododendron camtschaticum album

Go to any lecture on alpinism, and a fair proportion of the audience will be taking notes. If they are anything like mine, viewed later in the light, they will be almost indecipherable. Back in 1978, Sheila Maule gave a lecture to the Discussion Weekend, held that year in St Andrews, on a plant-hunting trip to Alaska. These weekends are very intensive affairs, with hundreds of slides on view, but I can still visualise two of Sheila's, such was their impact at the time. One was of a pink form of a normally white-flowered plant, *Diapensia obovata* var *rosea* taken in the wild, and the other, a white

Rhododendron camtschaticum, growing in Mrs Strutz's garden in Anchorage. Both went straight to the top of our wanted lists, where they were destined to remain for quite some time. The diapensia still eludes us; and it has taken almost ten years before the rhododendron opened its first flower at Askival.

Mrs Strutz sent seed of her plant to the ARGS and SRGC exchanges for 1983/84, and we requested from both. We had good germinations in April 1984 and the seedlings were 'trayed-up' in May 1985. They were potted individually the following year; but in common with many white forms, they were slower than the type, and none flowered until their second year in pots, i.e. 1987. All the plants had foliage of a paler, more apple-green than our other forms. Thus we were not really surprised, but thrilled, when the dozen or so that flowered all produced blossoms of an immaculate clear white; the sort of flower that draws the eye by its sheer purity.

The dwarf deciduous *Rhododendron camtschaticum* is too well known, especially in Scotland where it grows very well, to require a detailed description. Suffice to say that we find it easy, our cold climate holding it back so that the young foliage and flower stems, with their distinctive leafy bracts, are seldom frosted. We grow two other fine forms, the rich pink one we obtained from the late General Murray-Lyon, and a larger one from Hokkaido with enormous, more purply flowers. An American friend, Douglas Tryck, who also lives in Anchorage, tells us the original white plant is alive and well; let us hope that its children continue to prosper in Europe.

Thalictrum tuberosum

We are including this plant not because, to quote from the Show Schedule, it is "new, rare or difficult", but because it is surprising it has done so well in a Highland garden. The three plants described above are the sort one would expect to grow this far north. Not so *Thalictrum tuberosum*, which perhaps comes into the category we have described as MRW (Mediterranean Roadside Weeds). Although it may certainly occur by roadsides, its distribution is not really that of a typical Mediterranean species, being found in the foothills of the Pyrenees, extending south into adjacent parts of north-east Spain.

Our plant was found by a friend, the "other" SRGC member in Fort Augustus, near Artesa Del Segre, virtually the last high ground before one descends south towards Lerida and the dry, hot plains of Ebro. It was dormant when we received it in late summer, just a small cluster of tuberous roots. Knowing how bulbs and tubers frequently fail to overwinter in pots here, we planted it straight out, "more in hope than expectation". We chose a small border on the west side of the house which we keep for

choice bulbs: *Fritillaria caucasica* is its next-door neighbour.

Next spring we were rewarded with a small tuft of glaucous, finely-divided foliage, equal to the best in the genus. A year later it flowered for the first time. The perianth segments are a beautiful ivory white, surrounding a cluster of yellow stamens. The upward-facing flowers are quite large, about 3cm across, at the other end of the *Thalictrum* scale from the green-purple fuzz of the running native, *Thalictrum alpinum*.

Now that our plant has settled in, it flowers for a very long period, starting in June and continuing until September. In this it is probably responding to the continual availability of moisture right through the summer months. *Lewisii tweedyi* has also shown this adaptation to changed conditions, when grown in the open ground here.

Thalictrum tuberosum very sensibly goes dormant during the winter, like a "normal" herbaceous plant. Rootstock hardiness should not be in doubt, since along with *Cistus laurifolius*, it grows around Teruel, where the lowest Spanish temperatures are recorded. More typically Mediterranean perhaps are those plants which remain wintergreen. These are seldom satisfactory at Askival; with few exceptions, like *Arum italicum*, their foliage cannot stand our searing winter winds.

Canadian Journey: A summer of alpiners and others

RICHARD SIMPSON

THIS SUMMER I undertook the longest expedition of my life, a 15,000 mile exodus to Canada including 8,000 miles using a Canadian Airlines Skypass which gave access to any scheduled route in Canada to the west of Toronto. For the incredible price of £190 we enjoyed three weeks of unlimited 'standby' travel which facilitated visits to the National Parks of the Rockies in the province of Alberta (Banff and Jasper) through to British Columbia and up into the North West Territories at Yellowknife, with side trips to visit Niagara Falls and the Canadian capital, Ottawa. The Skypass can only be purchased in UK; one gets three weeks for the price of two if a ticket is purchased before 31st May in the year of travel.

The abiding impression of Canada is the vastness of the country; one can be in wilderness within a few dozen miles of the majority of big cities in the west. This country is a land of sparse settlement, few people, innumerable lakes and dependent still to a large extent on waterborne travel or the services of 'bush' pilots. Away from the prairie provinces of Saskatchewan, Manitoba and Alberta (in part) except in the Far North the landscape is dominated by trees, either predominantly conifers or broadleaves interspersed with conifers.

The Rockies rise from the foothills of Alberta to an average height of some 3,000m. Their size and extent is truly awe inspiring. Rivers flow for equally impressive distances either to the Arctic Ocean or into Hudson Bay. Those along the Great Divide between Alberta and British Columbia flow west into the Pacific Ocean. Many rivers originate from glacial lakes or directly from glaciers themselves. The extent of the glaciers is truly remarkable; the Columbian Icefield is up to 2,000m thick in some parts and is the second largest ice mass in the world after Antarctica.

North of Edmonton, Alberta, a prairie city, the land continues into the Canadian Shield, the oldest rocks in the world. The landscape consists of ice-grooved, rounded rocky outcrops interspersed with ponds and lakes on a scale truly gargantuan; apart from the Liard and Mackenzie Highways it is accessible solely by water or by light aircraft



Fig 1 *Lilium lophophorum* H23 (see p.9)

M. Stone



Fig 2 *Diplarche multiflora* McB 1103 (see p.8)

M. Stone

Fig 3 *Viola delphinantha* (see p.77)

M. J. B. Almond



with floats. Most settlements originated as forts of the Hudson Bay Company or the North West Company; as such their origin resides with the fur trade with the native peoples. Edmonton arose from Fort Edmonton, founded 1846, which exists in its entirety as a tourist attraction to the west of the city. Here furs were bought from Indian and European descent trappers; and the Meti, a people of mixed blood, to whom the opening up of the Canadian West can be largely attributed. To give an idea of distance, the bundles of collected furs were transported annually by water in 10m long riverboats built expressly for the purpose at the Fort, some 6,000km to York Factory on Hudson Bay, a return journey of some 5 months duration undertaken in summer.

The landscape of the North West Territories is dominated by Boreal forest with tracts of wetlands associated with shallow lakes. The two largest lakes are more like inland seas; the Great Slave Lake has the territorial capital and gold mining town of Yellowknife on its northern shore; 560km to the north of this is the Great Bear Lake.

In the Far North bounding the Arctic Ocean and Hudson Bay the boreal forest gives way to the treeless Tundra, or at least to a land containing prostrate trees such as Arctic birch and Arctic willow. A transitional zone, the Taiga, lies between, again reflecting the situation on mountains.

I have briefly described the nature of the vegetation zones to set the scene for the similar transition that takes place as one ascends the mountains of the Rockies. The most easily accessible sites in Banff National Park are Sunshine Meadows and Sulphur Mountain, both of which are served by cable cars. The Jasper National Park some 240km north of Banff townsite starts in the vicinity of the Columbia Icefield; the most famous botanical sites are subalpine meadows below Mount Edith Cavell, and the Whistlers, a relatively low mountain nearer to Jasper townsite. The latter site has a cable car service to the summit from which one can walk the ridges to other and higher alpine sites.

The journey from Banff to Jasper can be accomplished in the comfort of an air conditioned coach; the scenery is absolutely magnificent, mile after mile of peaks of various shapes, long ridges, high waterfalls, mountain lakes of that most ethereal blue green colour of glacial waters. The highway follows the valley of the Bow River up to Bow Lake, the waters of both show this remarkable colour. After the Lake the valley floor is dominated by the Sumpta, North Saskatchewan and Athabaska Rivers which are relatively shallow and gravelly deposits are a feature dividing the waterway into many channels; these same deposits give the water a grey hue. Incidentally the Athabaska River flows some 2400km before emptying into the Lake of the same name. The cirques of the

south side of the valley contain both small and large glaciers. The aptly named Crowfoot Glacier being the first one of great size, the name was given because the glacier has three toelike fronts.

The route leads to various passes over the Great Divide into British Columbia, perhaps the most well known being the Kicking Horse Pass. The forest clothing the valley floor consists largely of coniferous trees, in flatter areas extensive wetlands occur with many familiar marshland plants around the margins of shallow lakes. In the vicinity of lakes the tree cover contains broadleaves such as aspens, cottonwoods and various willows. The gravel deposits were literally whitened by the silky seed heads of various species of mountain avens (*Dryas* spp) mixed with pink drifts of fireweed (*Epilobium angustifolium*). Occasional clumps of Indian paintbrush (*Castilleja miniata*) reddened the roadside gravels. These three plants seemed to dominate the sward for the dozens of miles of the highway.

A few days stay at Jasper townsite enabled a closer investigation of the plant associations of this Montane Zone. The roadside verges show a more varied flora than was apparent in the view from the coach. Beneath the trees and at the edge of the roads the vegetation contained many species of the Ericaceae family, including various species of vaccinium, almost impossible to differentiate without fruit or flower. On more open ground I was surprised to find extensive mats of mountain catsear (*Antennaria lanata*), with a gentian, *Gentianella amarella*, just opening its flowers. In this open canopy the single red fruit of bastard toadflax was a feature, with an occasional flower spike of nodding onion (*Allium cernuum*). But perhaps the greatest glory was the clumps of *Gaillardia aristata* which Americans call black-eyed Susan (Fig. 13 p.69) and numerous bushes of *Potentilla fruticosa*. Other species recognised were *Anaphalis margaritacea*, *Hedysarum sulphureum* and *Solidago multiradiata*. A yellow species of clematis grew along the ground rather than scrambling over bushes, but which species I do not know as no reference to it was made in local floras. Numerous species of aster and erigeron were also present along the roadsides and in the open forest of this dry grassland/forest habitat at an altitude of some 900m.

From 1210 to 2000m we enter the Subalpine Zone, again dominated by coniferous forest but containing different species. The lower altitude forest has extensive stands of Lodgepole Pine, a result of forest fires at the turn of the nineteenth century. At higher altitudes this is replaced by whitebark pine, subalpine fir and Engelmann spruce, until at timberline the few trees remaining become reduced in stature and eventually absent. The height of timberline varies with aspect, it is about 90m higher on south facing slopes. The flora in this zone is not

very rich in herbaceous species save in the clearings and subalpine meadows. Lichens, mosses and ferns predominate, the bright green wolf lichen being a conspicuous feature on the bark of trees.

But for me the greatest thrill was to explore the Alpine Zone. In Jasper Park this can be sampled easily by using the cablecar up the Whistlers, so named for the call of the Whistling Marmots said to be the typical small mammals of the mountain, we did not see or hear a single one! However, the ground squirrels were a more than adequate compensation and great entertainers. In Banff National Park herds of mountain sheep were impressive, particularly the males with their huge backwardly curved horns. Females and the lambs were much more wary of human visitors to their stronghold on Sulphur Mountain.

Other animals spotted included elk and moose; elk commonly grazed close to the townships even entering gardens, to the great detriment of their floral display! A female moose with a calf was seen drinking from the River Athabaska. Squirrels were also common here, having the typical reddish fur unlike their cousins in Toronto parks which were black, though the same species. Woodmice, voles and their predator the weasel were less often seen. The overall impression was of the remarkable tameness of wildlife, a tiny mouse nibbled at seeds quite unconcerned about my presence nearby, and in towns the squirrels would feed from one's hand.

The richest alpine ground visited was that on the Whistlers in Jasper Park. In the immediate vicinity of the top station of the cablecar the vegetation had been so severely trampled that areas were cordoned off to allow them to revegetate, and in other places the mat had been replanted. Nevertheless, it was here that a single specimen of *Androsace septentrionalis* was growing in company with *Gentiana glauca*. A short walk brought one into the heath vegetation zone with the reddening leaves of bearberry (*Arctostaphylos alpina* ssp. *rubra*) prominent amongst *Salix arctica*. Occasional clumps of phyllodoce, probably both *P. empetriformis* and *P. glanduliflora* but hard to tell in the absence of flowers, grew in the cassiope heath.

On clearer ground the vegetation consisted of *Dryas* spp and *Antennaria* spp. Very occasionally a wind blasted conifer is found, such trees are known as 'Krummholz' (German-'crooked wood'). At the sides of the mountain and on the scree covered summit the true alpinines were predominant; their cushion habit was very apparent, a survival mechanism against the desiccating winds and frosts. The first finds were *Potentilla diversifolia* and *Silene acaulis*, both widespread and very floriferous. Then the talus was blued with the delightful single bells of *Campanula lasiocarpa* in company with *Saussurea densa*. Only the

leaves of alpine anemones were seen, even the plumed seeds had long since been dispersed by the wind. Occasional groups of *Arnica alpina* dotted the barren land. The only saxifrage noted was *Saxifraga bronchialis* which grew in company with *Erigeron compositus* (Fig. 14 p.69) (both ssp *trifidus*, *discoideus*) and *Oxyria digyna* on the broken rocks of slopes rather than on flatter scree and boulder fields.

The last exciting find was the light yellow flowered *Castilleja sulphurea*, the pallid paintbrush. Despite the excitement of seeing these arctic/alpines of summer it was disappointing not to see the earlier flowering bells of *cassiope*s and *phyllodoce*s. The great mats of *Dryas* spp including the yellow *D. drummondii* would have been a wonderful sight. Only single late flowers of *dryas* were observed at lower altitudes. But nature must adapt to the all too short growing season of these high altitudes, or latitudes. Growth, flowering and seed set must be achieved within the short summer period of little more than two months. Posild reports that *Pulsatilla ludoviciana* on the Mackenzie River delta began growth on May 15, that flowers appeared on May 25 before the new foliage had developed, and that by June 25 the first seeds had been dropped.

And so on to Yellowknife and the fascinating low country of the Boreal Forest. A short stay precluded the more extensive investigations undertaken in the Rockies, but an early morning foray by the margin of a shallow lake was interesting. Amongst the grasses the most conspicuous plant was grass of Parnassus, *Parnassia palustris*, growing here like a daisy would in the UK, a beautiful flower. A 'felwort-like' flower kept it company but I was unable to identify this. On the huge rounded rocks the vegetation was prostrated: juniper, *Arctostaphylos uva-ursi*, *Vaccinium* spp and *Solidago multiradiata*, which appears to have adapted its growth form to every habitat visited. The Ericaceae bore their bright red fruits. This was an interesting habitat which in the States is called 'muskeg'.

Finally on to British Columbia . . . but that's another story!

I hope that if you received seed from the Seed Exchange which was collected through my ramblings that it produces the wonderful plants that I saw on these travels. Good growing!

Plant enthusiasts shouldn't move house

BRIAN HAMMOND

ARE you a plant-collecting nut? Can't you pass a nursery or garden centre without going in to see what rarity might lurk there? If so, take heed – one day you may need to move house. You then face a dilemma – what do you do with the hundreds or thousands of plants you've collected and cossetted for years? Do you say good-bye to them all and start again, or do you dig them up and take them with you?

Three years ago we decided we needed a bigger house and garden. As if one third of an acre wasn't enough, we purchased an old cottage which was surrounded by ½ hectare of land. The cottage, however, needed considerable work done on it (more than we thought) and the land was 2m high in docks, thistles and brambles.

We felt that we couldn't bear to part with all the plants we had grown from seed, scrounged from friends, got from the SRGC meetings or bought with our hard-earned cash. So we decided to take as many as possible with us, and this is where our troubles really began.

Moving house, as many people will no doubt agree, is a trying time; moving a garden as well is a quick way to a nervous breakdown.

What do you take? What do you leave behind? When do you move them? What do you tell the people who are buying your old house? These are just a few of the problems that have to be faced. In order to satisfy the law, you have to supply prospective purchasers of your property with a list of plants you are taking and a plan of where they are in the garden. I know all the gardening books and TV programmes tell us we should have a plan of our gardens – but how many people do? How many of us can draw well enough to make one? If they have spare money to spend on the garden, most gardeners I know buy plants. They don't pay a garden architect to draw up a plan of what they have already.

Before you can draw your plan you have to face another problem. What goes with you and what stays? That's no easy task in itself. Which old friend that has flowered consistently for you for years do you leave behind in order to take some rarity which just hangs on to life and has never flowered? Do you take smaller plants on the principle that they may survive the move better? You've also got to consider what you are going to do with the plants at your new abode until the land is in a fit state to receive them.

When we started listing the plants we felt we couldn't leave, two points

became evident. Firstly, moving the number we had initially chosen was going to be a mammoth task. Secondly it would leave the old garden looking very bare indeed. Obviously we had to be more selective. A friend then suggested a simple solution to our problem (and I don't mean giving up the idea of moving). Take only those that are too small to provide propagating material or don't root easily from cuttings. Propagating material can then be taken from the rest and, to quote Alf Evans, "lent to your friends". Alf once told me you should never give away plants, you should always lend them on the condition that if yours dies you can have a bit back. I'm sure Alf won't mind me using his idea, it certainly helped to solve our problem. What was an unmanageable list of thousands came down to 350.

Now several years later, with a garden in a fit state to receive them, we are now starting to get back the grandchildren of the plants which grew in our old garden. This is one of the great joys of being a gardener and belonging to a group such as the Angus section of the SRGC. There is always someone you can call on for help and advice about garden problems.

Suppose you've decided, with much help and soul-searching, what goes and what stays. Three problems still face you. Firstly – when do you move them? We were lucky we changed house in October, which is one of the best months for moving things in the garden, or between gardens. I'd hate to carry out the same exercise in July. If you are stuck with a summer date, remember you are going to need to do a lot of watering over the next three months, even in Scotland. Your casualty list is certain to be higher. So, if possible, plant enthusiasts should only move house in the autumn or early spring.

Secondly – before you start lifting the plants, water them well for several days and make sure you have sufficient containers to put them in. Some plants tend to be like icebergs – the bit below the soil is often much bigger than the bit above. You need lots of big pots or buckets, so go and see your local friendly butcher. He will often let you have big tubs that liver, etc., comes in. With a few holes in the bottom, they make excellent pots for big plants. We had several fairly large rhododendrons growing in these quite happily for two years.

Thirdly – there is the obvious problem of logistics. How do you actually transport 350 plants ranging from 2cm rosettes to 3m trees? Here again our gardening friends rallied round and moved them for us, leaving us free to transport our furniture, the children's toys, the dogs and the contents of the potting shed.

With the move finally over, we set about the task of putting the new house and garden into shape. This is, however, another story; suffice it is to say that my wife now dreads me saying, "Have you got a minute to

spare, dear?" as it normally ends up with her humping barrowloads of soil or rocks. Eighty per cent of the plants spent their first two winters in the makeshift pots they were moved in. The first winter there was no overhead protection. Despite this our losses were minimal. One primula succumbed during the first winter, and two other plants failed during the following summer. I would consider losses of less than 1% in an exercise of this sort to be good. By the time they were planted their numbers had swelled to well over 400. I didn't stop collecting even when I had nowhere to put them. Beware! Plant collecting is addictive.

Looking back on the exercise, I sometimes think we were insane to try it. Friends who have not yet caught the gardening bug, although I'm trying hard to convert them, are convinced of my insanity. Our solicitor was confident he'd get another fee for acting for my wife in the divorce court. Sorry, John, not this time. Certainly if you are a plant collector and married, you need a sympathetic wife.

So if you are thinking of moving house and garden, I hope I haven't put you off the idea. Go ahead and try it. I certainly don't regret the experience, it taught me a lot about gardening. Margaret and Henry Taylor wrote in the SRGC journal, vol. XIX, part 4, page 368, that "Shuffling is good for you". It didn't do us any permanent harm if you ignore the grey hairs. I can now sit back and enjoy the more normal plant enthusiast's pastimes. You know – those moments of joy when after four years of loving care, *Meconopsis napaulensis* finally flowers. Or the periods of sorrow when it dies without setting seed, your favourite petiolarid primula rots off at the base and next door's cat digs up your peat garden. I often wonder what it is that makes gardeners continue with their hobby. Is it out of enjoyment, or are we all masochists at heart?

The genus *Ranunculus* Part V – Australian and New Zealand species

ALASTAIR McKELVIE

THERE ARE many good garden plants to be found among the *Ranunculus* species of New Zealand but only a few among the Australian species. By and large they are difficult to grow and very few have really become established. They are best raised from seed which must be fresh otherwise germination can take a couple of years.

New Zealand

The NZ species range from coastal areas to rocky alpine areas well above the permanent snow line. They belong to two sections – Chrysanthe with 16 species found in cool shaded places usually below 1,000m and Epirotes with 20 species, divided between 6 lowland and 14 alpine species. The only one of the Chrysanthe section remotely worth growing is *R. lappaceus*, a widely distributed species which will be described under Australia. None of the lowland Epirotes section is worth considering for the garden.

The alpine Epirotes are a most confusing section to study; in this article I have tried to simplify the situation and to draw attention to worthwhile species for the garden. The serious reader is referred to “Alpine *Ranunculi* of New Zealand” by F. J. F. Fisher published in 1965 by the New Zealand Department of Scientific and Industrial Research as Research Bulletin 165.

There are approximately 56 specific names in the literature for these alpine species but Fisher has “lumped” them into 14 species, a classification which I will follow. These species show little affinity to species elsewhere in the world, the exceptions being *R. buchananii* which is close to the Australian *R. anemoneus*, and *R. verticillatus* which has some resemblance to the Australian *R. gunnianus*. Some are fairly close to a number of Andean species in section Trollianthoideae, which will be discussed in a later article dealing with South America.

The alpine species hybridise freely and have given rise to a large number of Latin names but anyone interested in these is referred to Fisher where they are dealt with in detail.

Perhaps strangely in a country where most flowers are white, all but two of the New Zealand *Ranunculi* have yellow flowers. The two exceptions are *R. lyallii* and *R. buchananii* which have glistening white flowers.

Ranunculus baughanii Petrie.

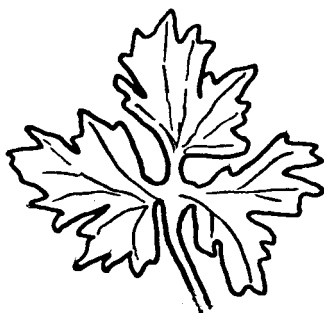
This is a naturally occurring hybrid between *R. buchananii* and *R. serico-phyllus*. The flowers are large and cream-coloured, intermediate between the two parents.

Ranunculus berggrenii Petrie.

This is a synonym of *R. enysii* q.v.

Ranunculus buchananii Hook. f.

This is a high-level alpine species which grows near permanent or semi-permanent snowfields of South Island in stabilised debris where melting snow supplies a constantly wet medium. It grows between 1,000 and 2,200m and flowers around December although this can extend to April in some places.



It is a sturdy perennial more or less

covered with long silky white hairs with a thick rhizome and numerous long fleshy roots. The rosette leaves are deeply cut although this can vary somewhat between plants. It grows to a height of 20-30cm but dwarf forms occur and, indeed, the few exhibited at Shows in the UK always seem to be quite dwarf. The flowers (Fig.4 p.31) are solitary or 2-3 to a stem, 4-6cm in diameter and pure white. The petals are narrow linear-oblong and rounded at the apex.

The late Jim Le Comte in *Alpines '81* (p.182) wrote that this was his favourite alpine describing it as a plant with glistening pure white often double-petalled blooms rising above crinkled grey-green foliage. It is not in general cultivation in this country but is occasionally exhibited at Shows, although it has never been given an Award. Jack Drake at Inshriach grew it quite successfully, getting it to flower in three years from sowing. It flowered in mid-summer, reaching a height of 30cm but did not survive more than three years.

It is occasionally offered in Seed Exchanges and should be snapped up if possible. It is a challenge to produce the melting snow conditions it seems to prefer but if it can be grown and flowered it is worth all the effort.

As will be seen throughout this article it produces various hybrids which will be mentioned under the hybrid name. One hybrid between *R. buchananii* and *R. lyallii* was awarded a PC in 1975 when shown by Jack Drake. It was intermediate between its parents.

Ranunculus X buchlyallii

This is a name sometimes given to a hybrid between *R. buchananii* and *R. lyallii*.

Ranunculus chordorhizos Hook. f.

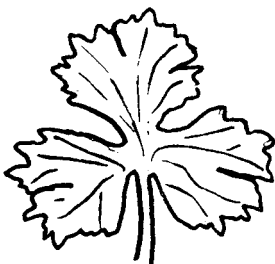
This is a synonym of *R. crithmifolius* q.v.

Ranunculus crithmifolius Hook. f.

This species has variously been called *R. chordorhizos* and *R. paucifolius*.

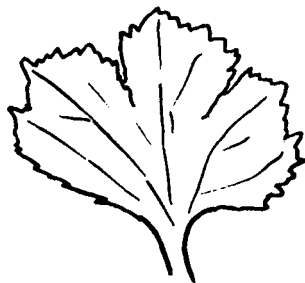
It is a small perennial herb, completely glabrous, fleshy and coriaceous (leathery). The leaves are all from a rosette with no stem leaves. The flowers occur usually singly on a short stem up to 3cm which often elongates at fruiting time. They are bright yellow, 3-5cm in diameter; the petals are linear-obovate and slightly notched.

There are two sub-species: *R. c. crithmifolius* and *R. c. paucifolius*. The taxonomic literature is not at all clear as to the differences between them and even if they should be kept separate as sub-species. However, horticultural literature seems to regard s.sp. *crithmifolius* as having trifoliate or deeply-divided leaves which are bright green, as opposed to s.sp. *paucifolius* which has lobed leaves, blue-grey rather than green. The first s.sp. is fairly common in the easterly parts of the Southern Alps but the second s.sp. is confined to a small area of limestone debris at 600m near Canterbury.



R. c. crithmifolius grows in semi-stable screes and bare clay areas and is found locally in the drier more easterly mountains. It is a very attractive plant which is rare in cultivation but is occasionally found in seed lists. Henry and Margaret Taylor presented a plant to the Joint Rock Garden Committee in 1977 but it did not receive an award.

R. c. paucifolius is a much rarer plant which has, however, been grown more often in the UK. It was in danger of extinction, being down to a mere 32 plants on Castle Hill but, although still listed as a vulnerable species in the IUCN Red Book, it is now apparently safe. An excellent account of this sub-species on Castle Hill is given by Robin Allen in AGS Bulletin 34, 314 (1966).



It grows in the refrigerated bench of the

Alpine House at Kew as well as in a number of alpine houses throughout the world. It was awarded an AM at Perth in 1982 as a hardy plant for rock garden or alpine house when shown by Eric Watson as *R. paucifolius*.

In cultivation it seems to require well-drained conditions, with plenty of water during the growing season. It appreciates the protection of the alpine house provided the atmosphere can be kept cool but not too dry. Harold Esslemont described this sub-species in a Plant Portrait in the SRGC Journal and pointed out that it was grown for a number of years in the scree at the RBG Edinburgh with the protection of a cloche in the winter only. Harold grew it successfully in an alpine house by plunging the pot in moist sand and bottom-watering it when necessary. Re-potting was done in spring.

His article in Volume XIX p.384 was accompanied by a colour photograph (Fig.153).

R. crithmifolius hybridises in the wild with *R. gracilipes* and *R. insignis*.

Ranunculus enysii Kirk.

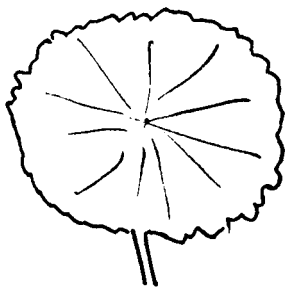
This species has been known under at least 20 different names over the years. It grows in sheltered places under scrub and beside snow tussocks in the subalpine zone of the easterly Southern Alps, from 100 to 1,500m. Flowering occurs in October–November.

The plant is small, coriaceous and completely glabrous. The leaves all arise from a rosette with no stem leaves. They are rounded and vary greatly in the amount of cutting. Flowering stems are from 15 to 40cm and the flowers are 1.5–3cm in diameter, bright yellow.

It is not a particularly attractive plant for the garden, often being rather straggly with small flowers on tall stems. There are few references to its cultivation. Jack Drake in 1971 described it as an “elegant buttercup with yellow flowers over cut leaves and growing to a height of 10cm”. Margaret and Henry Taylor, however, regard *R.*

enysii as the only NZ buttercup which will grow and flower outside in Scotland.

R. enysii forms natural hybrids with *R. gracilipes* and *R. insignis*.



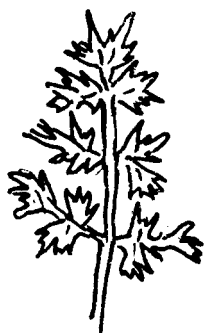
Ranunculus godleyanus Hook. f.

This species is confined to an area around Mt. Hunt and Mt. Sefton in the Southern Alps where there is a very high rainfall and at altitudes where there are permanent icefields

and glaciers. It grows from 1,300 to 2,000m, flowering from December to February.

It is a stout erect glabrous perennial with stems up to 60cm tall. Leaves are glabrous on thick fleshy petioles, oblong or rounded. Flowering stems are thick and fleshy with large bracts from which arise several simple or branched flowering peduncles. The flowers are 3-5cm in diameter, bright golden yellow.

This is not a species which has been reported in cultivation which is not to say that it has not been grown somewhere. It is somewhat coarse and too tall for the rock garden. It has been experimentally crossed with other species in New Zealand and it is possible that something of interest may arise.



Ranunculus gracilipes Hook. f.

This species grows in dense colonies in sheltered streams or bogs arising from snow melt at a height of 900 to 1,500m. Flowering occurs in November to December.

It is a small slender plant sometimes glabrous or with long silky white hairs. Leaves are deeply cut and multi-pinnate. Flowers are small, up to 2cm in diameter, yellow.

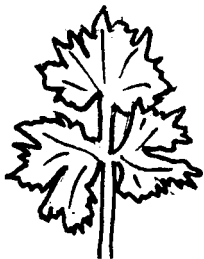
It is not a plant of any great garden merit and has not been reported in cultivation.

Ranunculus grahamii Petrie.

This species reaches the highest altitude of all the New Zealand species, being found up to 2,700m around the Tasman Glacier of the Southern Alps. It is a short stout species up to 12cm high. The flowers are quite large, up to 3cm in diameter, for the size of the plant.



It is rare in the wild and also in gardens where it is seldom found, being of no especial merit.



Ranunculus haastii Hook. f.

The specific name was give by Sir Joseph Dalton Hooker in honour of Sir Julian Von Haast, a German scientist who came to New Zealand in 1858 and made a great contribution to science in the early days of the colony. This is a highly specialised species (Fig.9 p.34) which grows in the unstable shingle and scree

on the dry eastern ranges of the tussock-grassland belt of the Southern Alps at an altitude up to 2,000m.

There are two sub-species: *R.h. haastii* and *R.h. piliferus* (syn. *R. scott-thomsonii*) which differ in their leaf shape and their ecological habitats but these differences do not matter to the alpine gardener.

It is a stout fleshy perennial with only a very few leaves, deeply incised with lobed segments. Stems are up to 15cm tall and the flowers are yellow, 3-5cm in diameter.

This is an attractive species which would be an asset to gardens but it is especially adapted to the moving scree areas of the Southern Alps and, according to Brinsley Burbidge (*Alpines '81* p.183) it is almost impossible to grow in cultivation. On the other hand in a splendid article on this species, Keith Thompson (*Bulletin AGS* 35, p.53, 1967) gave detailed instructions for cultivation. He advocated a sunny moist slope which must not be allowed to dry out in the summer. It should, however, be noted that he was growing it in New Zealand in the very greywacke stone debris in which the plant grows naturally.

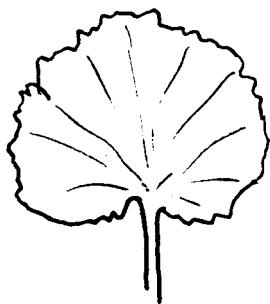
Anyone interested in growing *R. haastii* should consult Keith Thompson's article.

Ranunculus insignis Hook. f.

This most handsome and conspicuous species (Fig.5 p.32) is distributed widely over both North and South Islands, growing in shady scrub and tussock grass from 700-1,800m but occasionally coming right down to sea level.

It is a fleshy perennial herb which can vary greatly in size from 10 to 75cm tall. It is often quite hairy with tawny-brown hairs on the underside of the leaves, which are ovate-cordate, thick and leathery and 10cm across. The flowers are a glowing buttercup yellow, 2-3cm in diameter in the wild but as much as 5cm in cultivation. They have a shining green boss of achenes in the centre, surrounded by a mass of golden stamens.

This must be one of the most attractive New Zealand ranunculi. Jim Le Comte, in *Alpines '81*, stated that it was fairly easy to grow and could make quite a show with its bold shining dark green leaves and its sparkling yellow flowers. In the same volume, Brian Halliwell said that it was easy to grow at Kew, flowering freely for many years in peaty soil at the edge of a woodland garden in light shade. At Inverewe it grows alongside *R. lyallii* on a rocky slope while Jack Drake grows it at Inshriach in cool peaty soil.



It was awarded an AM in 1984 when exhibited by Dr Peter Semple.

At one time *R. lobulatus* and *R. monroi* were regarded as separate species but they are now included in *R. insignis* as they show complete inter-gradation.

Ranunculus lobulatus Kirk.

This species is synonymous with *R. insignis* q. v.

It was awarded a PC in 1964 when shown by Maj.-Gen. Murray-Lyon who in his description recognised that it was very similar to *R. insignis*.

Ranunculus lyallii Hook. f.

This must surely be the most imposing buttercup in the whole world with its huge heads of large white flowers (Fig. 8 p.33) on stems as much as one metre tall.

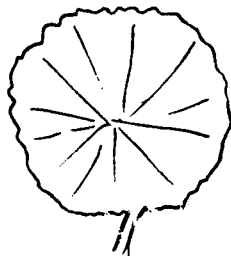
Known as the Mount Cook or Mountain Lily it grows in the high rainfall areas of the central chain of the Southern Alps among rocks and bushes alongside mountain streams as well as in sheltered subalpine scrubland. It can be found from 450m in the south to as high as 1,500m further north, preferring moist rich soil wherever possible. It flowers from October to January.

It is a large bright green perennial with rosette leaves on long stout stalks, the blades being rounded up to 40cm in diameter. The flowering stems have a few sessile (stalkless) bracts, the lower ones being rounded and the upper ones linear.

There are 5-15 flowers per stem, 5-8cm in diameter and matt white in colour. The five sepals are almost as large as the 10-16 petals which are narrow and obovate with many stamens.

R. lyallii has been described as "nearly a successful garden plant". There is a vast literature on the growing of it, often conflicting in the advice given, but usually agreeing that it is short-lived and needs moist but not stagnant soil. The Victorians seem to have had the most success. The Gardeners' Chronicle has many articles on cultivation. One of the earliest is from F. Moore of Glasnevin who grew "imported crowns" in a north-facing frame for 7 years and then flowered it. His advice was to avoid stagnant soil and to grow in shade of a wall or bank in peaty soil and sand.

As would be expected Alpines '81 has plenty advice about this species. Brian Halliwell recommends growing it as a waterside plant in moist but not stagnant conditions, saying that it is not easy outside "even in Scotland". In a pot it will grow and flower but the blooms are a travesty. He suggests putting the seed in a refrigerator for 2-3 weeks before sowing.



Jack Drake grew it successfully at Inshriach in deep very rich moist soil. My own experience in such a situation in Aberdeen was that it grew and expanded for 5 years from seed before disappearing for good one winter without ever flowering.

It used to be a well-known plant at Branklyn in Perth where it flowered in June, although not every year. It was tried in various places but was most successful in cool moist peaty soil, mulched annually with sieved leaf mould and given plenty of sun. It was beloved by slugs as are most choice plants it would seem. In New Zealand it is devoured by deer!

It is too large a plant to be suitable for the rock garden but if you like a challenge then here is one. Seed is regularly available from the Seed Exchanges.

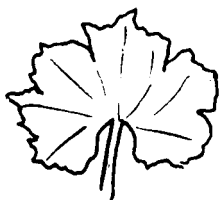
It has produced hybrids in the wild with *R. buchananii*, *R. godleyanus*, *R. insignis* and *R. sericophyllus*, some of which have been given names and have been grown in gardens.

Ranunculus matthewsii

This is a name given to the hybrid *R. buchananii* x *R. lyallii*. See under *R. buchananii*.

Ranunculus monroi

This species is synonymous with *R. insignis* q.v.



Ranunculus nivicola Hook. f.

This is another large graceful and beautiful species which grows in a small area of South Island from Mt. Egmont to the Kaweka and Raukumara ranges at altitudes of 1,200 to 1,800m. It seems to prefer subalpine scrubland and volcanic slag. It flowers from December to February. It is an erect leathery perennial up to 80cm tall often covered in soft white hairs. The leaves are on long petioles and are heart-shaped with deep lobes. The flowers are large golden-yellow, 3-5cm in diameter with narrow obovate petals.

For all its apparent beauty it has not made an impression on botanical literature and does not seem to be in cultivation, at least in the northern hemisphere. I expect it is grown in New Zealand.

Ranunculus novae-zelandiae

This is a synonym for *R. ensyii* q.v.

Ranunculus pachyrrhizus Hook. f.

This is a high alpine species restricted to a small area in the south of South Island. It grows in patches where snow seepage provides abundant water at altitudes of around 2,500m.



This has been placed among the so-called “creeping” members of the genus all of which belong to the Chrysanthe section but *R. pachyrrhizus* is without doubt a member of the alpine Epirotes section. It is a small species with creeping rhizomes no more than 4cm high, covering quite large areas of ground. The leaves are in small rosettes at the end of branches and are softly hairy. The flowers are up to 2cm in diameter with yellow linear petals.

There are few references to its cultivation but several people have commented favourably on its potential. Jack Drake referred to its neat yellow flowers when he saw it in the wild, while Harold Esslemont in the 1966 Clark Memorial Lecture mentioned that he was growing it and that it had been well spoken of by one of his NZ correspondents.

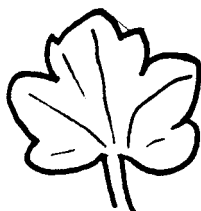
Ranunculus paucifolius Kirk.

This is now regarded as a sub-species of *R. crithmifolius* q.v.

Ranunculus pinguis Hook. f.

This is a common plant among the windswept grassland and rocky moors of the Auckland and Campbell Islands from sea level to 600m.

It is a short fleshy perennial to 20cm high with many fleshy roots rather reminiscent of our celandine. The flowers are pale yellow, about 2cm in diameter.



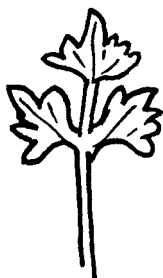
It is obviously not grown to any extent in gardens and would seem to have no great claim to our attention.

Ranunculus traversii

This is a name used sometimes for the hybrids *R. godleyanus* x *R. lyallii* and *R. insignis* x *R. lyallii*.

Ranunculus scott-thomsonii

This is now known as *R. haastii* var. *piliferus*



Ranunculus sericophyllus Hook. f.

This species grows high up (to 2,100m) throughout the South Island in rocky places supplied with water from melting snow. It is the highest of the NZ alpine buttercups except for *R. grahamii*. It flowers in November and December.

It is a short bright-green perennial to 20cm high. The rosette leaves are deeply divided into fine segments and are covered in long silky hairs although glabrous forms



Fig 4 *Ranunculus buchananii* (see p.23)

R. B. G. Edinburgh



Fig 5 *Ranunculus insignis* (see p.27)

R. B. G. Edinburgh

Fig 6 *Ranunculus gunnianus* (see p.36)

R. B. G. Edinburgh





Fig 7 *Ranunculus anemoneus* (see p.36)

R. B. G. Edinburgh

Fig 8 *Ranunculus lyallii* (see p.28)

R. B. G. Edinburgh





Fig 9 *Ranunculus haastii* (see p.26)

R. B. G. Edinburgh

occur. The flowers are large, 3-5 cm in diameter and golden yellow with 5-8 obovate rounded petals.

It has not been grown much in cultivation but received a PC in 1966 when shown by Harold Esslemont. The description referred to the beautiful golden yellow flowers with each petal having a bright green blotch at the base making a conspicuous eye in the centre of the flower.

In 1979 A. J. Richards described this species as "great golden suns sitting on finely divided fern-like leaves looking for all the world like a huge adonis". He brought back seed but it failed to germinate, which is not really surprising.

R. sericophyllus would seem to be a plant worth re-introducing to cultivation unless someone somewhere still has it in their garden.

Ranunculus sinclairii

This is now known as *R. gracilipes* s.sp. *sinclairii*

Ranunculus simpsonii

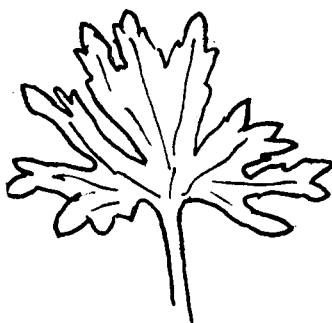
This is synonymous with *R. sericophyllus*.

Ranunculus verticillatus Kirk.

This species is common in wet grassland or scrub in northern South Island and the southern parts of North Island at altitudes from 800-1,500m. It flowers from December-January.

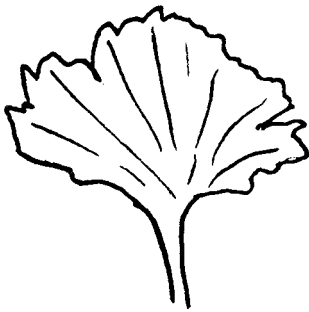
It is an erect floppy perennial with deeply cut leaves and few yellow flowers 2-3cm in diameter.

It is of little garden merit and is not mentioned in the garden literature.



Australia

The Australian species of *Ranunculus* are neither as numerous nor as spectacular as those from New Zealand. Nevertheless there are a few of some garden merit even if the most beautiful is not at all easy in this country.



Ranunculus anemoneus F. Muell.

This species from Mount Kosciusko in New South Wales grows beside permanent snow patches on steep shaded slopes where the soil is almost permanently wet. From a mass of fleshy roots and a rosette of deeply divided silky leaves rises a stem up to 30cm high with flowers 5-8cm in diameter and many frilly white petals (Fig.7 p.33).

This is one of the most attractive alpine *Ranunculi* and perhaps the most spectacular of all Australian alpine plants. Yet it is only of fleeting cultivation in the UK. As Jim Archibald has pointed out in *Alpines '81* one of the problems of cultivating New Zealand and Australian alpines is to grow on the seedlings. He felt that we could probably grow *R. anemoneus* successfully in the UK if we could solve this problem. Seed is frequently available but in spite of this it has not been grown successfully. I have plants raised from seed six years ago but although they have survived outside in a permanently moist place they have never flowered. They have made little growth in the last two years and may be on their way out. Considering that they grow in the wild alongside *Caltha introloba* and *Aciphylla glacialis*, there may still be hope for this elegant buttercup.

Ranunculus graniticola Hook.

This species grows beside *R. anemoneus* in short moist turf often near melting snow patches. It is a small fairly undistinguished buttercup with dark green incised leaves and a short stem of 10cm carrying single yellow flowers, 2cm in diameter.



Like its more elegant sister it needs permanently wet conditions if it is to grow at all in the UK. Seed is sometimes available and I have grown plants for two years from seed. It has not yet flowered, primarily because the slugs are very fond of it. It is not, however, likely to be a plant of any great garden distinction even if successfully grown.



Ranunculus gunnianus Hook.

This is a species which grows at altitudes of 1,800-2,000m on the New South Wales/Victoria border. It also likes plenty moisture and is found beside melting snow. It is a small plant with narrow lobed leaves which can give a lacy effect. The flowers on 10cm stems have large narrow yellow

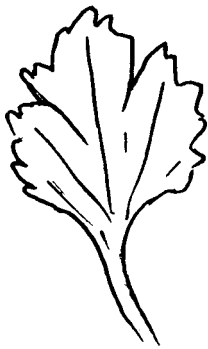
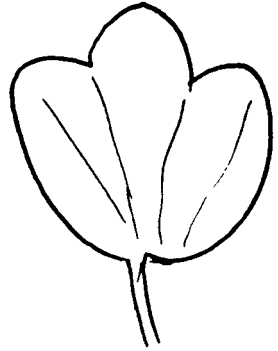
petals which give it a daisy-like appearance (Fig.6 p.32) and give the damp mountain slopes bright splashes of yellow. K. D. Gillanders in the SRGC Journal Vol.II p.225 (1969) described its finely bisected leaves as resembling a larkspur, the flowers large and golden and the red seed heads produced in abundance.

It is rare in cultivation. Jack Drake offered it in 1965 but it is doubtful if it is still to be found in gardens. I kept it going for five years but it never flowered and eventually succumbed to winter wet and cold.

Ranunculus lappaceus Smith.

This is one of the few species of *Ranunculus* which can be found in both Australia and New Zealand. It is not an alpine species but grows from almost sea level to around 300m. It is a neat little tufted plant which seems to be quite amenable to cultivation.

It grows to about 15cm tall and produces its bright yellow glossy flowers for months on end on dry hillsides, being particularly fine in Tasmania. It seems to be easy to grow in the southern hemisphere but there are no recent reports of it in the UK.



Ranunculus muelleri Benth.

This is another species of the mountains of south-east Australia growing with *R. anemoneus* on Mount Kosciusko but in rather drier places. It is better known in gardens by its sub-species *brevicaulis*. It is a short plant, particularly in the sub-sp. with dark green entire but slightly toothed hairy leaves. The bright yellow flowers on 7cm stems are 3cm in diameter and are borne singly (Fig.16 p.87).

This is a species which is in cultivation in the UK but which needs a certain degree of care. It grows in nature in drier spots than its buttercup companions and seems to need a certain amount of protection from winter wet. It is also loved by slugs. The sub-species is frequently available in the Seed Exchanges and has appeared at Shows. Neat but not spectacular.

Ranunculus niphophilus Smith.

This is yet another species of Mount Kosciusko where it grows in the same snow patches as *R. anemoneus*. It resembles *R. muelleri* but the leaves are much more divided. It has the same general habit and has bright yellow flowers which can frequently form large colonies, visible at a distance, below snow patches. It is not described in the gardening literature as being in cultivation and is probably of little garden merit.

My care of Rhododendrons

ZDENĚK SEIBERT

CONSIDERING the heap of literature on rhododendrons, it seems everything has been said and written on the matter, yet all the time new knowledge is being published.

Rhododendrons are amongst the loveliest garden shrubs and long-lived into the bargain. I am fascinated not only by the flowers, but also by the diverse hue of the leaves which alone would justify rhododendrons a place in gardens.

There is an astonishing number of species and hybrids flowering from early spring to late summer to choose from. Most rhododendrons dislike alkaline soils, but on the other hand they are very tolerant of, even resistant to, acid rain and ammonia as well as to air pollution by farm animals. For example, all the conifers and flowering shrubs planted on the farmyard of a large piggery in our district died. They were replaced by rhododendrons which grew and thrived well.

I have been growing rhododendrons for 14 years or so since we moved from Prague to Tachov near the FDR border. Our garden slopes to the north and lies at an elevation of 500m. The soil is lime-free. In the ordinary run of things we have enough snow in winter so that the dwarf and semi-dwarf rhododendrons are well protected, but some recent winters have been unreliable. In the depths of winter a thaw often sets in and the snow turns into slush. The gardener has to take it into account and also to reckon with strong frosts of -25°C , and sometimes even more.

The genus includes many species which can withstand our unfavourable conditions. Among the Lapponicum series there are plants sufficiently hardy with us, i.e. *RR. hippophaeoides*, *capitatum*, *compactum*, *complexum*, *drumonium*, *edgarianum*, *fastigiatum*, *fimbriatum*, *impeditum*, *microleucum*, *orthocladum*, *scintillans* and *stictophyllum*. They are suitable for small gardens and for any weather and climate conditions. I grow such shrubs on beds. Some of the larger species of varied series are also of great hardiness. I grow such species as *RR. smirnovii*, *catawbiense*, *fortunei*, and *maximum* in the back of the beds. An old broad-leaved rhododendron hybrid has been growing here in a neglected garden for 40 years or so without being ever watered or protected and, although at the mercy of the weather, it suffers no harm at all.

The first plant I grew many years ago was a specimen of *R. kotschyi* dug up in the Bucegi Mountains in Rumania. My joy didn't last long. The plant

was soon lost. Later on I managed to get seed of this species collected again in the Bucegi Mountains and raised a lot of plants. Some of them were planted in beds and others in the rock garden. This species belongs to the Ferrugineum series, which also contains *RR. ferrugineum* and *hirsutum* from the Alps and the Pyrenees, and the hybrid between both the species, *R. x intermedium*. *R. kotschyi* has a spreading habit and reaches 30cm in a sunny position in my garden. The rosy pink, tubular flowers occur in profusion in June. The plant blooms for a second time in summer, although not as well, and even has some flowers for a third time in autumn. There is a white form under the name *R. kotschyi f. album* or *albiflorum*.

R. ferrugineum and *R. hirsutum* and their natural hybrid *R. x intermedium*, which I raised from seed collected in the Alps, are easy to grow here. They flower in June or July, escaping the frosts. The hybrid varies in the wild in height and habit of growth and in colour from crimson-purple, red, rose to white as well. My plants have remained dwarf and compact. The plants can live as long as 100 years in the wild.

A species which especially caught my fancy is *R. chrysanthum*, syn. *aureum*. It is native to Siberia, North Korea, North Mongolia and Japan and can be found on scattered gravel, rocks, in the alpine tundra growing among moss and lichen and also under the canopy of conifers in open forest. According to my friend, Ing J. Holzbecher from the Botanical Garden in Brno, who visited Tanchoi in the Chamar-Daban Mountains in Siberia south of Lake Baikal, *R. chrysanthum* grows in moist moss under *Picea obovata*, *Abies sibirica*, and *Larix sibirica* in rather shaded positions at a height of 900 to 1,000m. The lake is often frozen up to May and early June. The summer is hot but very short.

According to Leach, Evans and other authors, *R. chrysanthum* is slow to bloom. In spite of this, my plants raised from seed from the ARGS exchange are free-flowering. But how to explain this? Either it could be due to the local climate and soil condition or my plant is a free-flowering clone of garden origin. This question will be solved as soon as my other plants of *R. chrysanthum* from wild seed from Siberia, North Korea, and Japan have grown up a little. As far as I can judge it, the seedlings are genuine slow-growers and of smaller foliage.

Other species hardy with us which do not need any protection even if the snow disappears are *RR. canadense*, *dauricum*, *sichotense*, *ledebouri*, and *camtschaticum*. For some years past, March and the early April have been frost-free and *RR. dauricum* and *ledebouri* managed to flower on frost-free days.

I cannot help mentioning *R. schlippenbachii*. It is a woodlander from Japan, Korea, Manchuria and the USSR. It grows in its natural habitat to 4m but in cultivation less than 2m. My plant is 40cm or so, therefore I did

not have to prune the shrub. The inflorescence appears before the leaves emerge. From a distance, the flat, saucer-shaped, gentle, pink star-like flowers nodding in the breeze seem to float in the air as magic butterflies from a fairy-tale. It offers a sight on which the eyes may dwell with pleasure. This species is reliably hardy with us. According to Greer it tolerates frost to -31.5°C .

R. caucasicum is also a suitable species for our climate. I raised it partly from seed collected in the Caucasus and partly from seed from botanical gardens. The plants from wild seed resemble *R. chrysanthum* in their compact and dense mound-like habit, and even so they are extraordinarily slow-growing. Even though the plants are six years old, they haven't flowered yet. The plants from seed from botanical gardens turned out to be worthless.

March to May brings a great danger of frost damage for those plants which are not perfectly hardy with us and which get early morning sun. I protect the dwarfer of them with brushwood in case there is insufficient snow. Plants requiring shelter include *RR. campylogynum* with the var. *myrtilloides*, 'Treasure', 'Silver Chimes', *nakaharai* 'Mariko', *prostratum*, *radicans* and the like. Plants with a little taller growth which start to grow early under the influence of sunshine are also susceptible to late frosts. I protect plants such as *RR. ambiguum*, *rubiginosum* and *campanulatum* with discarded old curtains over which I lay some brushwood as well. This protection is sufficient. It is a pleasure when even non-hardy species as *R. rubiginosum* are clad with a lot of flowers in spring. Some authors recommend protecting the shrubs with dry leaves, straw, bracken and netting. In my experience this isn't good advice. For one thing, the dry leaves and such stuff hold moisture, which causes rotting, and for another it is a drudgery in spring to clean the mess and to put the beds in order.

Some irresistible but tender and vulnerable species which wouldn't survive on the beds even if protected and which I am reluctant to give up I keep in cold frames. There are gardeners among the rhododendron enthusiasts who spare no effort to provide safe overwintering. A rhododendron fan grudges no pains to move tender shrubs planted in barrels partly to the glasshouse and partly to the cellar, but this is beyond me. My frames are very simple. They are buried 30-50cm in the ground. The main frame sides, in order not to come into contact with damp soil, stand on a base of old discarded sleepers to avoid rotting of the wood. The frame is covered with a top-frame made of four timber-laths nailed or screwed together at their corners, and instead of glass it is covered with stretched polythene. The front can come down to enable the melting snow or rain water to flow down. The frames are closed on freezing days, and when the temperature goes up the frames are about 30cm ajar. The young

plants in the frames get dappled shade in summer from the cane blinds. In these frames I keep such plants as *RR. bauhiniiflorum*, *cinnabarinum*, *citriniflorum*, *concatenans*, 'Chikor', 'Curlew', *pubescens*, and *pumilum*.

I think every rhododendron grower yearns inwardly for some plants he admired in a picture or read about. Perhaps it is a piece of man's infinite yearning for the unattainable. My dream is to get hold of *R. redowskianum*. As far as I know there are no references about growing this species in the garden or raising it from seed. My transplanting it from nature to the botanical garden went awry. I tried to get seed of this species, but it was of no avail. The botanical gardens in China and in Vladivostok, USSR, haven't collected this seed for years, and the expedition to Korea searched hither and thither but didn't find the plants. This rare plant not being in cultivation is a challenge for me, but it is in the lap of the gods if my dream comes true.

R. redowskianum is, according to M. S. Alexandrova, a small, deciduous, densely-twiggy shrublet with leathery oval to elliptic leaves at the tops of the branchlets and with purple flowers (1-3 per truss) on long stalks. It grows on rocks and in thin woods in the alpine tundra. The species is allied to *R. camtschaticum* and *R. glandulosum*. It blooms in the wild in July.

Following the recommendation of Peter Cox and other authors, I sow seed in early January in heat under artificial light. Seed received later than March I keep in the refrigerator till the next year. The seed germinates under this condition within 14 days. The seed of *R. schlippenbachii* collected in North Korea in 1986 and sown in January 1987 came up within six days. The same seed sown a year later, i.e. January 1988, germinated in seven days. Some species take, of course, a little more time to germinate. Wild seed gives true progenies as a rule. Some years past I used to sow seed of *R. camtschaticum* in the faint hope of gaining different colour forms as I know that red, pink and white exist, but in vain. Different forms can be grown by sowing seed from different localities.

A very fine plant and a must in every rhododendron collection is *R. racemosum* Drake's selection. This plant, though a selected one, breeds true whether it is either hand-pollinated or is the only one in flower at the time. When I sowed *R. pseudochrysanthum* 'Exbury form', I received progenies of three forms: with silvery leaves and red undersides, with silvery leaves and green undersides, and with green leaves. Now I am looking forward to seeing the flowers.

Many gardeners take cuttings in summer. I was told by a commercial grower that he took cuttings in winter as the winter was for him a time of doldrums and idle hours. I tried this method and to my surprise it worked. The cuttings in the pots, i.e. batch of a species in one pot, were enclosed

in polythene bags and placed in a heated glasshouse with the temperature from 18 at night to 24°C during the day, under the artificial light. In November and December I took cuttings of following specimens: RR. 'Vinestar', 'Mother Greer', 'Patty Bee', 'Coral Velvet', 'Egret', 'Kimberley', *davidsonianum* and 'Lucky Bit'. Now, in early February, the cuttings look promising and seem to have started to root. Many of them are beginning to sprout. I do not recommend pulling out cuttings in early stages, but nevertheless I lifted some of them and saw they had already rooted. It doesn't mean that cuttings of all species or hybrids will root in winter. I don't dare to lay down any hard and fast rule about rooting cuttings as I do it on a small scale, but one thing remains certain: there are many factors in play – first and foremost the quality of the cuttings. Professional gardeners and skilled amateurs have the knack of choosing the correct cutting. Then it is of importance to provide the proper rooting conditions. The result often hinges upon the capability of the gardener to prevent the cuttings from suffering from the effects of hot weather in summer. I find it easier to put up the temperature than to reduce it on a hot day. From this point of view, winter propagation by cuttings has a certain advantage. Last but not least, rooting can be spurred by using rooting hormones. I have got good results with Seradix, but before treating the cuttings I insert them in a solution of Benlate or Previcur to avoid rotting.

Some species and hybrids are easy to root whenever taken. I succeeded in rooting RR. 'Scarlet Wonder', 'Bad Eilsen', 'Baden Baden', 'Elisabeth Hobbie' and 'Pink Beauty' each month from July to December. Perhaps it would be possible to take cuttings from some rhododendrons also in February. Jan Palmer from the Berry Botanic Garden, Portland, Oregon, propagates rhododendrons in mid-February.

Prosperous, sound and healthy development of the rhododendrons depends on the soil. Although rhododendrons grow in nature on soil of different pH, from pH 3.8 to over pH 6.0, according to Otto Burchards, most of them are satisfied with pH 5 to pH 6. In my experience the best soil mixture for development of vigorous, thick and stout root-balls is three parts of pine-forest humus (the dark layer of decayed needles found under the layer of undecayed needles), three parts of fibrous peat, three parts lime-free soil and one part sand. Once a year I add to the rhododendron beds a teaspoon of dried blood per three dwarf shrubs or per one taller one and a little old decayed cow-dung. Unfortunately it is no longer permissible to exploit forest humus, therefore I prepare such stuff myself from needles from brushwood used for winter protection and from pine-bark chips and dried twigs of needle-trees. The layer of needles on the beds also helps against weeds, the seed of which the wind blows on the rhododendron beds. The surface of this needle-cover gets dry quickly and the germinating seed dies.

I'd also like to mention companion plants for rhododendrons. There are many plants which complement each other, but one must not allow companion plants to shade the rhododendrons and compete with them. In my experience it is better to associate dwarf and semi-dwarf specimens with cassiope species than with ericas and callunas, which are more suited to taller shrubs because they can develop enormous root-balls and begin to oppress the rhododendrons. Of course, ferns can be also used on rhododendron beds but not those tending to become weeds. I planted *Polystichum retroso-palaeceum* and *Dryopteris dickinsii* from Japan in a group of azaleas 'Gibraltar', 'Hotspur Red' and 'Balzac', and both the ferns did very well.

Without a doubt, spring is made much more charming when the rhododendrons are in bloom.

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[*Dr Seibert, from Czechoslovakia, is to be congratulated on writing this article in English. Naturally a considerable amount of editing had to be done to turn the text into conventional English idiom. The Editor takes responsibility for any errors which may have crept in during this editing.*]

Sir Joseph Dalton Hooker, O.M., C.B., F.R.S., F.L.S., V.M.H., etc. 1817-1911

A. C. SMALL

JOSEPH DALTON HOOKER was born at Halesworth, Suffolk, in 1817 and died at Windlesham, south of Ascot, in 1911. In 1821 he went with his family to Glasgow, where his father had been appointed to the Chair of Botany and, perhaps not surprisingly, he showed at an early age an interest in and an aptitude for that subject. But first he studied medicine and, in 1838, graduated M.D.

Although he did not get on very well with his grandfather, Dawson Turner, an amateur collector of cryptogams, he agreed to arrange Turner's herbarium, good experience for a botanist.

About this time the British Association had persuaded the Government to send an expedition to the Antarctic to establish the position of the South Magnetic Pole, and James Clark Ross, discoverer of the North Magnetic Pole, was the obvious choice as leader. He was Captain of HMS Erebus, of 375 tons, and a supporting ship, HMS Terror, of 300 tons, was under the command of Capt. Crozier. Joseph had been introduced to Ross and, after some manoeuvring, was appointed assistant surgeon on Erebus and botanist to the expedition, which set sail on 25 September 1839. Ross was very helpful to the young botanist, allowing him to share his accommodation and supplying him with such materials as he could, the Admiralty having provided virtually nothing for natural history purposes.

Although not a Scot by birth, Joseph had lived from the age of four to 22 in Scotland and all his life he had a great love for that country. The first port of call was Madeira, where he was happy to note the strong resemblance to the scenery of Scotland. So at all calling places he took the opportunity to botanise, e.g., at St Helena, the Cape of Good Hope and at Kerguelen Land (Desolation Island). At the latter the hill-tops were frozen and lichen had to be chiselled out or thawed by sitting on them. A local vegetable, the Kerguelen cabbage, provided greens for the crew for the next nine weeks, guarding against the dreaded scurvy. Very bad weather of gales and snow greeted them when they reached the southern limit of the Indian Ocean. Their next call was at Van Diemen's Land (Tasmania), where they encountered rival French and American expeditions on the same quest.

It was on New Year's Day 1841 that they met pack ice, 300km of it, but managed to get through it in four days and reached the farthest south 78°3', which was as near their objective as possible by ship and they estimated its position as 250km inland. Joseph also recorded no vegetation south of the Antarctic Circle. They now turned northwards for the Antarctic winter, reaching Hobart, Tasmania, on 6 April 1841, and visited the Derwent Valley to see the forest of tree fossils, 2m high and 1m diameter at base which he reckoned to be over 100 years old when fossilised. They were offered to Joseph for the British Museum, but he refused, considering that they should remain for ever on site.

In July they left for Sydney, New South Wales, on the way dredging to a record depth of 400 fathoms and collected good specimens. A further 11 days' sailing brought them to the Bay of Islands, New Zealand, where they remained three weeks during which time they met William Colenso, commemorated by *Cyathodes colensoi*, who had been sent by the British & Foreign Bible Society. Here they took the opportunity to cut down some trees as spars for sails, which had been lost in the storms.

On 23 November they started on their second southern voyage, making for Chatham Island and the Victoria Ice Barrier. A second New Year's Day in the Antarctic found them frozen in the ice, so they anchored to an iceberg and a jolly party with dancing was organised. But on the 17th a storm blew up and the ships were in danger of being crushed in the ice or colliding. Willy-nilly they were carried northwards back to where they had been three weeks earlier, till on 6 March they recrossed the Antarctic Circle and a week later, while surrounded by large bergs, a very severe storm arose. The ships collided and much damage was done to both though, thanks to Ross's fine seamanship, Erebus got free. Terror was thought to have sunk, but flares from Erebus thankfully were answered.

The next call was at the Falkland Islands, which Joseph thought were poor botanically, though he collected seed of tussock grass which could be good fodder, and later did well in Shetland. Off Cape Horn they landed on Hermite Island, the flora of which was reminiscent of the west coast of Scotland and confirmed his interest in plant distribution. Here he collected over 100 specimens of moss and many other plants similar to those of Britain, including 19 genera of grasses and a similar number of lichens. It was decided to send young trees to the Falklands hoping they would become established there, and over 800 of different species were sent.

On 17 December 1842 they turned to the south on their third venture and 11 days later they discovered land, probably the Antarctic Peninsula, also a group which Ross named Danger Islets where they were very nearly wrecked. At Cockburn Island, Joseph recorded the most southerly vegetation, 19 species of lichens, mosses and algae, some new to science.

On 22 February 1843, they crossed the line of no variation at latitude 62°30'S, longitude 22°30'W, and confirmed the position of the South Magnetic Pole. Finally on 5 March they attained 71°50'S and turned for home via the Cape, arriving at Woolwich on 7 September.

Ross now tried to persuade Joseph to continue in the Royal Navy with rank of full surgeon, but he was now very much interested in botany, no doubt influenced by his father who was now Director at Kew. Joseph did, however, agree to continue in the service provided he could leave when he wished. He then wrote the botanical notes of the expedition and added beautiful plates. Banks now tried, unsuccessfully, to get him to go to the tropics. In December, Joseph was presented to Queen Victoria and Prince Albert.

The pay of an assistant surgeon being very small, he applied for the Chair of Botany at Edinburgh University but lost to J. H. Balfour and, although he was offered the Chair at Glasgow, he declined. At this time his father was asked to recommend an experienced botanist to establish the relationship of British flora, living and fossil, to geology. Joseph was suggested and accepted and, although the salary was only £250 per annum plus expenses, it would be possible to do much of the work at home so that he could continue his work on the Antarctic flora.

In 1846 he visited the South Wales and Bristol coalfield searching for fossil plants and the following year completed *Flora Antarctica*, volume I of the expedition report. Meanwhile his father, hoping to get Joseph appointed as his assistant and successor at Kew, approached some prominent persons to assist but Joseph would not toady to anyone.

To a British Association meeting in Oxford he took his sister Elizabeth, and there, meeting her best friend Frances, daughter of Professor Henslow, fell in love and soon they were engaged to be married. That same year he was elected F.R.S. by a large majority.

His interest in plant distribution continued to grow, he was not bound to his laboratory but had to go and to see for himself. Samuel Turner's 1785 account of the flora of British India inspired him to go there and collect plants for Kew and also fossils for the Geological Museum. Vast quantities were sent home together with herbarium specimens and 300 timbers for the Economic Musuem. He travelled with his friend Hugh Falconer, who was to take charge of the Calcutta Botanic Garden, and with Lord Dalhousie, the new Governor-General, and his lady. They went first to Alexandria, thence by the canal to Suez where they boarded the *Moorzuffer*, a steam frigate of the Indian Navy with very limited accommodation. Joseph was put into the armoury which was very hot; everything was covered with coal dust and he lost nearly all his plants by sea water. At Calcutta he divided his time between the home of Sir Lawrence Peel

which had beautiful grounds near the Botanic Garden and Government House five miles away. The first part of the trip was geological and Joseph met David Williams of the Geological Survey who provided him with an elephant which, when directed, picked up stones with its trunk and tossed them backwards. After parting from Williams, he went by boat on the Ganges to Bhagalpore, thence inland and upwards to Purrea where he noted changes in the vegetation with ferns, mosses and orchids appearing. At this stage he was, not only botanist and geologist but geographer, mineralogist and cartographer.

He now went off on the first of two major expeditions to the Tibetan passes, climbing to 5,000m on the slopes of Kanchenjunga, then believed to be the world's highest mountain. At the Teesta Valley he met an old friend, Dr Archibald Campbell, who joined the expedition. At Bhom-song they had a splendid reception from the Rajah and received many presents. In January 1849 he returned to Darjeeling to despatch 80 loads of plants including 40 species of rhododendron.

The second expedition to the higher lands of Sikkim left in 1850 with a party of 50 consisting of porters, guards, five sepoy and two interpreters, and in addition to the usual annoyances of leeches and insect bites they had trouble with local officials. The route was by the valley of the Teesta and tributaries. On 23 July they reached Tungu where friendly Tibetans were grazing their yaks. But next day a violent storm with avalanches of boulders forced them to move. At 4,600m they crossed into Tibet, suffering from cold and sickness. At 4,700m they noted the highest level at which cultivated plants (turnips) grew. Then at 5,100m some 'arctic' plants and at 5,400m *Rhododendron nivale*. Early August saw them on the way back to Darjeeling to obtain supplies.

The Donkia Pass at 5,500m was reached on 9 September, then Mount Donkia, 5,800m, at that time the greatest height attained by man. In early October he left with Dr Campbell to go from Choongtam to Kongra Lama, and spent four days in Tibet making a second ascent of Mount Donkia and then Mount Bhomtas, 5,600m. On the way to the Chola Pass, both men were arrested by Tibetans who had a grudge against Campbell and were detained separately from 7 November till 23 December.

January, February 1851 saw Hooker busy preparing collections which he took to Calcutta, where he met an old Glasgow friend, Dr Thomas Thomson, and on 1 May left on a trip to Khasia Mountains in Assam. The Khasia people he found to be sulky, but the flora the richest in India, and he collected more than 2,000 flowering plants, including 250 orchids, 150 ferns and crowds of mosses, in all 80 loads. Rainfall during a seven-month visit was 1,250cm. At the end of June he started walking to the north face

of the mountains before leaving Churra by canoe, arriving Calcutta 17 November. He departed for home on 7 February, reaching London on 26 March to find rhododendron seedlings doing well. That year saw the publication of 'Rhododendrons of Sikkim'.

However, following recommendations from the British Association, the Royal Society, the British Museum and the Geological Society, the Government was persuaded to grant him £400 per annum for three years. He reckoned that if he had been in commerce he could have made £3,500 from the sale of seeds and plants.

The next five years were occupied in writing, inter alia, 'The Flora of the British Isles', 'Flora of British India', 'Flora of Ceylon', 'Flora of New Zealand', 'Himalayan Journey' and he started 'Flora of Tasmania'.

Following the Antarctic expedition, Darwin had invited Hooker to see his botanical collection and Hooker, with his interest in plant distribution, encouraged Darwin in his Theory of Evolution. In turn Darwin stimulated Hooker to write his 'Colonial Flora', which was of great benefit to settlers and manufacturers in the colonies.

In 1855, Hooker moved house to 50 The Green and also, in collaboration with Dr Thomas Thomson, produced Vol. I of 'Flora India'; no further volumes came out because of Thomson's illness. More importantly he was appointed Assistant Director of Kew under his father and, three years later on his father's retiral, succeeded him as Director. He started to reorganise the staff; the previous head gardener had been nearly blind and plants were dying. A clearance was made and, though he appealed for replacements, the Government did not sanction any appointments, not even a new Assistant Director. So he arranged for garden matters to be taken over by the keeper of the herbarium. He now concentrated on his collaboration with George Bentham on 'Genera Plantarum', begun 1857 and finished in 1883, which became the standard work for 100 years.

With Daniel Hanbury, F.R.S., he made a visit in 1860 to study the famous cedars of Lebanon, and found about 400 trees in one valley at 1,800m elevation the only vegetation there. All plants were dying of drought, no young trees, no alpinines and above 2,400m scarcely any plant life.

His wife's father, Professor Henslow, died and, a year later, his second daughter Minnie died, leaving him grief-stricken. Then in 1865 he suffered another great blow when his father died.

About this time it was thought desirable that caoutchouc (rubber) trees should be grown in India, and to this end H. A. Wickham left for South America to search for plants. He had an article published in a journal seen by the British Consul in Para who had it reprinted.. Hooker read it and

wrote to Wickham requesting seeds for Kew and India. Luckily a ship from Liverpool was looking for cargo; Wickham chartered the ship in the name of the Indian Government. Then he had a problem as the export of rubber seeds was prohibited. However, Wickham with the Consul visited the port official concerned and spun a tale of the beauties of Brazilian flora and proposed that a suitable collection be sent to H.M. Royal Gardens at Kew. The ruse was successful, clearance was given and soon the ship was on its way. Seeds were brought up from the hold and sown. From London docks seed was rushed to Kew, and just days later 2,700 plants were on their way to Ceylon.

Disaster struck the garden in 1887 when heavy snow killed many trees and other plants, but provided an opportunity to replant on systematic botanical lines and create new vistas. Hooker had received an LL.D. from Cambridge in 1866 and in 1869 was made a C.B.

He resumed his travels in 1871 with a trip to Morocco with John Bell and George Maw, hoping the heat would relieve his rheumatism. They were treated with suspicion till Hooker put it about that he was collecting medicinal plants. Despite frustrations the expedition was a success, but although the plants went to Kew he had to pay the bills.

In 1871 he engaged Prof. Dyer of Dublin to complete 'Cape Flora', begun by the late W. H. Harvey, and a year later Dyer was trained to take over as Exotic Correspondent at Kew and part-time private secretary to the Director. 1873 saw the publication of 'Journal of a Tour in Morocco and the Great Atlas', and he became President of the Royal Society.

The first Commissioner of Works in Gladstone's administration was A. C. Ayton who had no time for scientists, including botanists, and proposed converting Kew to a public park, hoping to drive Hooker to resign. Unfortunately the Government supported this move, so Hooker, backed by Huxley, concluded the only way to deal with this was to drive Gladstone into a corner and make it a political issue. Many leading figures in science supported Hooker and made their views known to the Prime Minister and also laid the matter before Parliament. A great battle ensued and Ayton, through Professor Owen, drafted a report containing many inaccuracies. Gladstone allowed the debate to wind up without expressing an opinion on Ayton's attack. The Grand Old Man now ordered Hooker to apologise to Ayton, which he did while maintaining his principles. Public opinion, however, was against Ayton and Gladstone moved him from the Board of Works to become Judge Advocate-General. Soon afterwards Gladstone resigned and Ayton's career ended.

Meanwhile Joseph's mother had died and in 1874, very suddenly, his wife Frances. He now took his widowed cousin Effie and her family into the household until in 1876 he married Miss Hyacinth Jardine, whose

father was an amateur geologist, and her late husband, Sir William Jardine, was an F.R.S. Edinburgh and F.L.S. It was to prove a happy marriage. In 1873 he had been made a Life Governor of University College London and in 1875 he was elected to the Senate. Thomas Jodrell Phillips Jodrell, a friend of Sir Joseph's, offered a gift of a laboratory for the study of plant structures and physiology, now known as the Jodrell laboratory, and W. T. Dyer, Hooker's private secretary, was put in charge.

Twice he had been offered and declined a knighthood, but in 1877 Lord Salisbury, unknown to Hooker, proposed to the Queen that he be appointed K.C. Star of India. So he at last became Sir Joseph.

Once again he set out on his travels, this time to the USA with Major-General Richard Strachey and his wife, who was a botanist for a Topographical and Geological Survey, and to report general findings especially on forest trees. His last journey in 1877 took him to Colorado to acquire a thorough knowledge of western conifers and at 60 years of age climbed 3,000m in the mountains which, naturally, he found hard work. Here he found what he thought must be the largest oak tree in the world, subsequently named 'Hooker's Oak'.

By 1878 he began to find the duties of President of the Royal Society irksome, too many committee meetings and the following year, to his great relief, his term expired.

Also that year he gave the Presidential address to the British Association, his subject 'Geographical Distribution of Plants'. That same year Bentham died, leaving to his collaborator the copyright of 'British Flora'. He next started work on 'Index Kewensis', a catalogue of all known plants for which Darwin offered to pay £250 per annum. The time for completion was estimated to be six years, but actually it took ten years. His old friend Sir Charles Lyell had died in 1875 and now in 1882 Charles Darwin. Hooker was asked to write an obituary, but excused himself as he was suffering from angina.

In preparation for retiral he bought a site for a house to be called 'The Camp' at Sunningdale near where he was born, and there he created a beautiful garden featuring rhododendrons and other shrubs. He retired there in 1885 and two years later was awarded the Copley Medal for scientific discovery and the advancement of science. Henceforward from all over the world honours were showered upon him.

He was also on the committee concerning Capt. R. F. Scott's first Antarctic expedition in 1911.

On his 90th birthday in 1907 he was the recipient of the very select honour, the Order of Merit, and in 1908 received from the Linnaean Society the Darwin/Wallace Medal on the same day as H. R. Wallace himself. (Wallace had conceived the idea of the Theory of Evolution at the

same time as Darwin, neither knowing of the other's work.)

During the remaining years of his life he spent much of his time clarifying the Genus *Impatiens*, identifying 303 new species. True to form, he worked to the end and put his affairs in order. When he died quietly in 1911, burial at Westminster was offered to the family but was declined as he had expressed a wish to be buried in the family grave at St Anne's Church, Kew.

PRINCIPAL PUBLICATIONS

Rhododendrons of Sikkim Himalayas
Flora of New Zealand
Himalayan Journey
Flora Tasmania (2 vols.)
Colonial Flora
Flora Indica
Journal of a Tour in Morocco and the Great Atlas
Genera Plantarum (with George Bentham) (3 vols.)
Flora of British India
Flora of the British Isles
Flora of Ceylon
Flora of New Zealand
Index Kewensis
Sketch of the Life and Labours of W. J. Hooker.

Flowers and birds in Israel

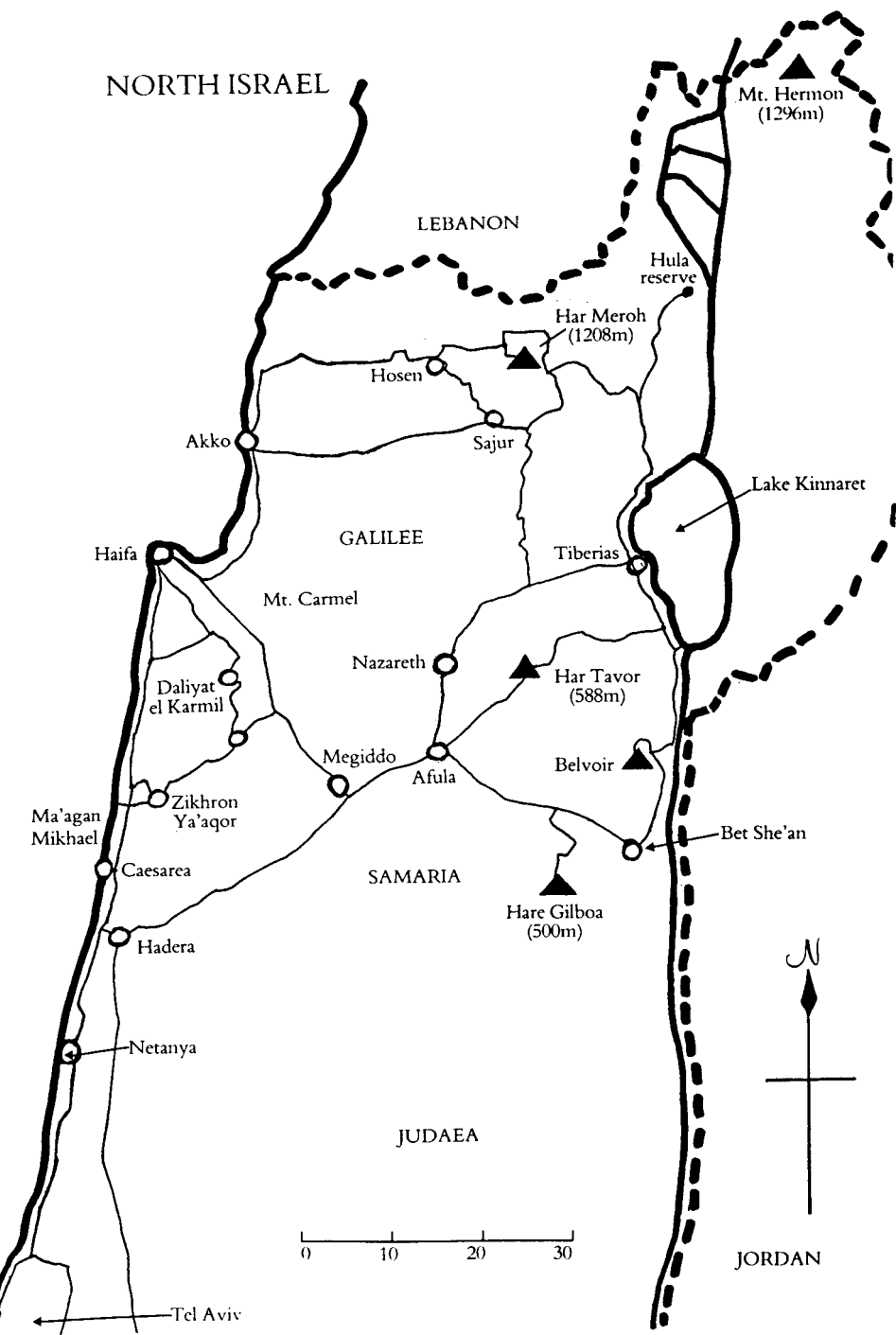
CHRIS AND MARIE NORTH

THE prospect of a first-time visit to the Holy Land is bound to be exciting. It is equally certain that the realisation of the “real thing” will not match up to one’s preconceived ideas – there will be disappointments and, hopefully, pleasant surprises. So it was with us as we went there in March 1987. One of the most pleasant discoveries was that the flora was more colourful and exciting than we had expected. As an added bonus the bird life was considerably richer than we had anticipated; so much so that we now think of Israel as a small bird-watchers’ paradise. This is due largely to the strong military presence, for private firearms are very strictly controlled there and the well-armed soldiers do not shoot at birds. It was a great help to us that one of our relations, Bronwen Háwks, a keen and knowledgeable bird-watcher, accompanied us. She kept her eyes and binoculars trained above and around whilst we looked on the ground.

The present state of Israel is bordered on the north by Lebanon, the west by the Mediterranean Sea, the south by Egypt and the east by the valley of the River Jordan, though part of what was Syria in the north-east – the Golan Heights, east of the Jordan valley – is now claimed by Israel. It is a small country, less than the area of Wales, but very varied in climate and topography and host to some 2,500 species of wild plants whereas the British Isles only has about 1,600 species. For convenience Israel can be considered as being broadly comprised of three areas with Galilee in the north, Samaria and Judaea in the centre and the Negev in the south.

Galilee is perhaps the most charming and the best area to look for plants. It is composed mainly of limestone and chalk hills which come to the coast as cliffs in the extreme north-west. In the south of Galilee is the fertile Plain of Jezreel and to the east the freshwater Lake of Tiberias – the Biblical sea of Galilee, now called Lake Kinnaret by the Israelis. The Golan Heights to the north-east of this lake stretch northwards to Mount Hermon, at 2,224 metres above sea level, is high enough to be covered with snow for the winter and one can go ski-ing there until the middle of May. The rainfall of Galilee is comparable with that of most parts of the northern Mediterranean region. There are pine and oak forests there and it is green in the spring.

The region of Samaria and Judaea also is composed largely of limestone hills with Jerusalem, more or less, in the centre of this region, but the rainfall here is much lower than in Galilee and decreases southwards and



eastwards so that pastures give way to the Judaeen desert and the very salty Dead Sea at 394 metres below sea level in the Jordan valley. Along the Mediterranean coast of Samaria and Judaea is the fertile Plain of Sharon bordered by extensive sand dunes and compacted sand cliffs – a relic of the quaternary period.

The Negev is sparsely populated desert which stretches to a narrow point in the south to the Gulf of Aqaba at Eilat. It is a colourful and interesting area both for plants and animals, but it is not truly Mediterranean in character and we did not visit this region.

There are a number of books on the flora of Israel area, but several are out of date with their nomenclature. We have standardised our plant names here against the recently-completed multi-volume standard work, 'Flora Palaestina' by Zohary, M. and Feinbrun, N. (1966-86). But we also found 'Flowers of Jerusalem' by Avigard, B. and Danin, A. (1972) and 'Pictorial Flora of Israel' by Plitman et al. (1982) useful. The last of these is in Hebrew with a short English text but has many fine photographs and useful distribution of maps; it is readily available in Israel as a useful and not too expensive holiday souvenir. The small H.M.S.O. booklet 'Bible Plants at Kew' by Hepper, N. (undated) gives some interesting information but does not provide a balanced view of what plants one might see in modern Israel.

Spring comes early in Israel so we started our visit on 25 March and spent two weeks based at Netanya (also spelt Nethanya = Nathom's town) which is on the coast a few kilometres north of Tel Aviv (Jaffa). With a hired car we drove on two occasions towards Mount Carmel that lies near the coast of Haifa and is a well-known place for plant enthusiasts but seems to be becoming rapidly built on. It is, in fact, an extension north-westwards of the Samaritan hills. Travelling north out of Netanya along the Haifa road we branched off east to Zikhron Ya'akov towards Elyaqim. The rolling limestone hills were covered with a truly magnificent carpet of flowers and we wondered whether they were the true 'Flowers of the Field':

<i>Anagallis arvensis</i>	<i>Linum pubescens</i>
<i>Anthemis palestina</i>	<i>Plantago afra</i>
<i>Artemisia squamata</i>	<i>Ranunculus asiaticus</i>
<i>Chrysanthemum coronarium</i>	<i>Salvia verbenaca</i>
<i>Echium angustifolium</i>	<i>Scabiosa prolifera</i>
<i>E. judaicum</i>	<i>Trifolium clypeatum</i>
<i>Erodium gruinum</i>	

In many places the pale yellow *Scabiosa prolifera* we had seen in Cyprus was the most prominent plant, intermixed with the beautiful pink *Linum*

pubescens, yellow *Chrysanthemum coronarium*, white *Artemisia squamata* and punctuated by a rather fine pinkish-lilac form of *Salvia verbenaca* and scarlet *Ranunculus asiaticus*. The *artedia* is an umbellifer similar to *orlaya* with white heads that have a prominent centre of sterile florets; it is a typical Levant species not found in Europe. *Erodium gruinum* is an especially large-flowered stork's bill we had seen previously in Cyprus.

By the roadside there were groups of the short but impressive bear's breech *Acanthus syriacus*, the tall pink hollyhock *Alcea setosa* and in places the impressive tall *Cerithe palaestina* with blackish purple upper bracts growing amongst a vigorous white-flowered vetch we were unable to identify. In places the ditches were alive with tadpoles and supported the water loving *Veronica anagallis-aquatica* – a very variable species similar to our *V. beccabunga*.

Turning off northwards near Elyaqim towards Haifa, the road climbs higher through pastures and patches of garrigue. There were prominent groups of *Lupinus pilosus* (*syn. L. varius*) with large blue flowers that have a pale blue or white upright marking on the standard. The garrigue, on rocky outcrops, contained the shrubs:

<i>Calycotome villosa</i>	<i>Pistacia lentiscus</i>
<i>Cistus salvifolius</i>	<i>Salvia fruticosa</i>
<i>C. villosus</i>	<i>Sarcopoterium spinosum</i>
<i>Genista sphacelata</i>	

Amongst these grew *Cyclamen persicum* in profusion, *Gynandris sisyrinchium*, *Gladiolus sp.*, *Ornithogalum narbonense*, *Linum pubescens*, a dwarf blue cornflower like our *Centaurea cyanus* but given specific status as *C. cyanoides*. There were plants of an unusual dark mauve form of *Orchis tridentata*, which looked like the pyramid orchid at a distance, and in some areas much *Ophrys carmeli* and *Serapias vomeracea*. Here and there the garrigue was accompanied by stands of the evergreen Palestine oak *Quercus calliprinos*, resembling a tall form of the cochineal oak *Q. coccifera*, which is common all over the Mediterranean. It is nevertheless a small tree rather than a bush, though it usually grows no more than three metres tall.

A wood near here, comprised mainly of *Pinus halepensis* but with much *Quercus calliprinos* and some *Rhus coriaria*, *Laurus nobilis* and *Pistacia palaestina*, contained a large number of plants typical of the area viz:

<i>Anacamptis pyramidalis</i>	<i>Linum strictum</i>
<i>Asphodelus microcarpus</i>	<i>Nigella ciliata</i>
<i>Campanula rapunculus</i>	<i>Ophrys carmeli</i>
<i>Centaurea iberica</i>	<i>Orobanche ramosa</i>
<i>Coronilla scorpioides</i>	<i>Scorpiurus muricatus</i>
<i>Eryngium creticum</i>	<i>Smilax aspera</i>

<i>Geranium robertianum</i>	<i>Trifolium clypeatum</i>
<i>Helichrysum sanguineum</i>	<i>T. purpureum</i>
<i>Lagoecia cuminoides</i>	<i>T. resupinum</i>
<i>Lathyrus aphaca</i>	<i>T. stellatum</i>
<i>L. marmoratus</i>	<i>Vicia narbonensis</i>
<i>Linum pubescens</i>	<i>Xanthium spinosum</i>

Lagoecia cuminoides we found attractive because of its racy name. It is a miniature annual umbellifer with feathery leaves and small umbels of greenish flowers that often hang downwards. It is found throughout the eastern Mediterranean and has been used and cultivated as a pot herb. *Nigella ciliata* is an uncommon love-in-the-mist with unbranched stems and greenish yellow flowers. Though it is not a showy plant, its flowers are of extraordinary architectural interest when viewed with a pocket lens. *Helichrysum sanguineum* is a tallish grey-leaved species with heads of bright red flowers. In Hebrew it is called 'Blood of the Maccabees' after the brothers who led a rebellion in Jerusalem against the regime of Alexander the Great in 165 B.C.

Continuing along the road from Elyaqim, one arrives at the Druze village of Daliyat el Karmil, well supplied with souvenirs for tourists. There are houses along the road from here to Haifa, but a road off to the west takes one through the nature reserve of Bet Oren with fine woods of the native oaks the evergreen *Quercus calliprinos* and deciduous *Q. itaburensis*. In this area the wild cabbage species *Brassica cretica* has recently been discovered, but the road is narrow and there are few stopping places where one can leave the car to look in the woods. Continuing along this road, one eventually comes to the Haifa-Tel Aviv highway.

The main road from Haifa to Tel Aviv passes through the Ma'agan Mikhael nature reserve where there are extensive fish ponds for the production of carp and bream, and it is a well-known area to observe birds that congregate near water. Although one can see this area from the road, it is not easy to find one's way in there, and we wasted much time looking for the road. For any reader wishing to go there, we record that one should leave the main highway at the signpost for Zikhron Ya'aqov, continue along this road to the traffic lights and then right. Some two kilometres farther on there is a track on the right which takes one under the main road to a kibbutz. One can leave the car on the dirt road by the ponds and wander between them without hindrance. Here we saw avocet, black kite, black-winged stilt, greenshank, lesser pied kingfisher, marsh harrier, shoveller duck, Smyrna kingfisher and three kinds of seagull. The pied kingfisher was especially charming. It is a small black and white bird that hovers above the water to drop vertically in for fish. There were mon-goose looking for fish – an ugly, coarse-haired but intelligent animal.

They must be fairly common in the region for we saw three that had been run over on the main highway. The area between the ponds was bright with *Chrysanthemum coronarium* in its plain yellow and bicolour forms. In the sand dunes grew the sea daffodil *Pancratium maritimum* and the coarse local bullrush *Typha domingensis* – a species which grows in Egypt and amongst which the baby Moses was found.

One can also get to the coast, though not so easily to the fish ponds, by taking the side road from the highway to the west labelled Caesarea which takes one to the ruins of the ancient port built by King Herod. Here grew the interesting, poisonous, solanaceous shrub *Withania somnifera* with small yellow, star-shaped flowers and the aptly-named ice plant *Mesembryanthemum crystallinum* that is found throughout the Mediterranean, though usually as an escape from cultivation as it has been grown for the production of soda. Here it is probably native, for it is said to come from Arabia as well as South Africa.

The sandy coastline south of Netanya is even more interesting. We could approach it from our hotel by crossing through gardens planted with the native *Tamarix aphylla* from the Negev that grows to an impressive tree with a trunk of considerable size. It was underplanted with sanseverias and provided a home for common bulbuls, graceful warblers and Palestine sunbirds. The bulbuls are cheeky little birds with black, velvety heads and almost replace the sparrows there. Graceful warblers are small, wren-like birds with upturned tails and the sunbird takes the place of humming-birds in the levant. A few kilometres south of Netanya in the sand dunes there is a colony of the magnificent native oncocyclus *Iris atropurpurea* which, unfortunately, had finished flowering by the time we were there. With three or four species or sub-species, it used to be classed as the mourning iris *I. susiana*. In the dunes here there were also the grey-leaved *Otanthus maritimus*, *Eryngium maritimum*, a tiny endemic, Virginia stock-like crucifer with mauve flowers, *Mariesia pulchella* and the magnificent shrubby evening primrose *Oenothera drummondii*. The head waiter at our hotel was sure that the last of these was the genuine 'Rose of Sharon', but there are several other candidates for this title including *Narcissus tazetta* and the endemic red *Tulipa sharonensis*. Indeed the oenothera has a very poor claim for it is a native of Texas, U.S.A.! In the sand dunes here, though it was very floriferous, it was frequently parasitised by a short-growing broomrape with straw-coloured flowers.

On other occasions we left the main Netanya-Haifa road for Hadera and drove on to Afula in the plain of Jezreel, passing through orchards of orange, avocado, date and some bananas. Travelling along this road, one could frequently see black kites, palm doves and sometimes chukkas. Stopping at a labelled picnic site called 'The Iron Forest', we saw few new

plants except fine bushes of *Styrax officinalis* and the endemic *Pistacia palaestina* with dried-up, sausage-shaped fruits from the previous season and the yellow-flowered woad *Isatis lusitanica* that has hanging fruits resembling ash keys. By the roadside grew another plant with mauve, and sometimes white, flowers which took us a long time to identify. It turned out to be the moss verbena *Verbena tenuisecta* (*V. erinus* of gardens), a native of the southern United States – a well established immigrant. Reaching Afula, we then continued to Megiddo and viewed the ruins of Armageddon dotted with windswept date palms. Past Afula, one rises out of the Plain of Jezreel to Nazareth by a steep road through woods of Aleppo pine on limestone. The road traffic was heavy, so we went into the woods to eat our midday sandwiches and here we saw the endemic *Podonosma orientalis* like a delicate comfrey with mauve flowers, *Orobanche ramosa* and our first tortoise in Israel. Nazareth was disappointing – a rather sprawling and untidy town, not at all like our Biblical image. Unfortunately we could not find the endemic oncocyclus *Iris bismarkiana* said to grow near here.

Pressing on farther north-eastwards, one comes to the town of Tiberias on the shores of Lake Kinnaret, the Biblical Sea of Galilee. It is a pleasant town with a Swiss lake-like atmosphere, and to add to the similarity we saw coot and tufted duck on the water. There were avenues of the tall palm tree *Hyphaene thebaica* – an Egyptian native from Thebes that has hard wood which is sometimes used for making furniture. Near here we saw the crown of thorns bush *Paliurus spina-christi*. The lake, which lies below sea level, is fresh water used for drinking and irrigation throughout Israel. In March the level is usually beginning to fall critically and stringent water conservation is then necessary, but this year the weather had been wetter than usual and the level risen so high that it was necessary to let some water down the Jordan valley to the Dead Sea.

Most of the area around Lake Kinnaret is of volcanic origins with acid soil and we saw some different species in the region. There were the globe thistle *Echinops adenocaulos*, the salsify-like *Geropogon hybridus* and *Gundelia tournefortii*. The last of these is a large thistle with orange-yellow midribs to the leaves and short flowering stems of small yellow or mauve flowers. It is said to be reasonably hardy in Britain and would make a specimen of distinction in the right place in a garden. There was also a really magnificent form of *Adonis cupaniana* with flowers nearly as large (some 5cm diameter) and as red as the best forms of *Ranunculus asiaticus*.

Continuing along the road on the west side of the lake and then northwards up the Jordan valley about seven kilometres from Tiberias, one comes to a turning on the right to the Hula Nature Reserve. Here one can promenade on cat-walks through the wet lands and acres of impressive papyrus *Cyperus papyrus* growing in its most northerly situation. It is

rather like a miniature Nile Delta, and before the turn of the century there were crocodiles here. Now the main inhabitants of the water are turtles, sinister large catfish that can give severe bites and, in places, water buffalo. From a hide we saw skeins of white pelican in flight, cattle egret, little egret, graceful warbler, white stork, hen harrier and osprey.

On our way back we drove westwards through Zefat, and near there in *Sarcopoterium spinosum* garrigue we saw groups of *Orchis caspia* which is a form of *O. papilionacea* that has rather robust, many-flowered spikes of flowers that are smaller than in the normal form. It has been classed by some taxonomists as identical with the subspecies *O. bruhsiana*. With it grew *Orchis italica* that is not mentioned by Davis and Davis (1983) or Sundermann (1975) as occurring in Israel. By the roadside grew an impressive horned-poppy *Glaucium grandiflorum* with finely divided leaves and very large red flowers some 30cm diameter – surely the most spectacular of the genus.

Continuing westwards towards the ruins of the Crusaders' city of Akko on the coast we passed through very pleasant wooded country and by the roadside near Shefar there was *Arum palaestinum* in flower. It is somewhat like a large form of *A. dioscoridis* in which the spathe is entirely dark purple on the inside. Unopened spathes are spotted purple only at the base as in *A. dioscoridis*, but they go darker all over the surface later. With it grew the delicate thistle-like *Crupina crupinastrum*.

Reaching Akko, we looked round the Crusaders' castle which had its resident *Hyoscyamus aureus*, and in places the walls were covered with the stock *Matthiola tricuspidata*. From here we made our way back to Netanya through heavy traffic and were glad of a rest after a long day.

On two other occasions we drove back to Zefat and up towards the summit of Hare Meron, which is the highest point of Galilee at 1,006 metres. We could not take the car to the top because of military restrictions and had to content ourselves looking through the garrigue a little lower down. We were not disappointed, for amongst bushes there were some orchids which at a distance seemed to be a large-flowered form of the rather dull *Neotinea maculata* until we realised that there is no record of it from this region. Pushing through the bushes to look closer it became evident that it was *Orchis galilea* – a distinct species confined to Israel and south Lebanon. It grew taller (25cm) and had smaller flowers than we had expected. The flowers themselves are rather like those of the monkey orchid and, as in that species, they come out first at the top of the inflorescence, but they are green with a few distinct red marks on the lip and a striped 'hood'. There is a form with entirely red flowers found only in Israel, but we searched for it in vain. Our enthusiasm over the discovery was dampened by finding that we had locked ourselves out of the hired car

with the keys in the ignition. It was getting late and we were far from habitation, so we reluctantly broke a window for which we had to pay, but the discovery was worth the cost.

Encouraged by this discovery we returned to Hare Meron to search farther afield. Although we found no more *O. galilea*, we did discover considerable stands of other orchids nearby:

<i>Cephalanthera longifolia</i>	<i>Orchis caspia</i>
<i>Epipactis veratrifolia</i>	<i>O. italica</i>
<i>Limodorum abortivum</i>	<i>O. tridentata</i>
<i>Orchis anatolica</i>	

The epipactis was not yet in flower, but it was extremely vigorous growing and showed all the other characteristics of *E. veratrifolia*, a species we had searched for without success in the Troodos mountains of Cyprus. Nearby grew the rare, endemic, white-flowered comfrey *Symphytum palaestinum*, rather badly eaten by insects. There was also the tall *Valeriana italica*, *Bellevalia flexuosa* and *Euphorbia hierosolymitana*. We took a different way back via Hosen and Sajur. In a quiet pine wood there was much convolvulus which might have been a form of the common *C. arvensis*, a scilla with ripening seed, probably *S. autumnalis*, and leaves of a cyclamen, possibly *C. coum*.

A lush cow-grazed area contained many plants of the beautiful red *Adonis cupaniana* we had seen near Lake Kinnaret that rivalled the red forms of *Ranunculus asiaticus*, and *Anemone coronaria* growing nearby. The real find here was *Scilla hyacinthoides*. It had not reached its peak of flowering, but stood out because the cows evidently did not like its taste and left it ungrazed. Near here there were many plants of *Narcissus tazetta* with ripening seed capsules. In an orchard on the way back, the ground was carpeted with yellow *Ranunculus millefoliatus* and pink *Silene palaestina*.

Another sortie was via Hadera to Hare Gilboa (Mount Gilboa), a 500m hill on the north-east of the Samarian heights to the south edge of the Plain of Jezreel. As we climbed up a forestry path, there were huge drifts of the Syrian thistle *Notobasis syriaca*, and passing through pine woods we saw by the roadside the white-flowered sage *Salvia dominica*, and the blue-flowered gromwell *Alkanna strigosa*. Near the top in an open site it was cold and windy but with a superb view over the Jordan valley. It is somewhere near here that Saul and his son Jonathan were routed and killed by the Philistines. About us grew the yellow *Ajuga chia*, an interesting branched, pink salsify *Scorzonera papposa*, the dwarf chicory *Chicorium pumilum* and the giant fennel *Ferula communis*. The greatest find, however, was *Iris haynei* – a beautiful large oncocyclis with netted, dusky-mauve, scented flowers. It looked out of place amongst the coarse grass and was

conspicuous but not abundant. Here also was *Fritillaria libanotica*, but the flowers were well past their best. On the way down we saw magnificent groups of the hollyhock *Alcea setosa*. Some had yellow and some mauve centres to the flowers, but we took them all to be of the same species. They grew in stands like foxgloves at home.

From Mount Gilboa we crossed the Plain of Jezreel north-eastwards, passing through Bet She'an, to drive to the ruins of the Crusader castle of Belvoir on top of a hill. The view was good and among the other hills one could plainly see the rounded mass of Har Tavor (Mount Tabor) to the north-west with a foreground of flowering woad. We drove up this hill along a winding narrow road, and at the top are two churches; the one called the Basilica of the Transfiguration is especially fine inside. Around the top of the hill were wooded areas of pine with *Quercus calliprinos*, *Crataegus azarolus*, *Pistacia palaestina* and *Styrax officinalis*. Near the churches grew *Lamium moschatum*, *Mandragora autumnalis*, *Clematis cirrhosa* and two nettles we do not see in Britain: *Urtica pilulifera* and *U. membranacea* – both of architectural interest in their own special way. A special find was *Asphodeline lutea* which is not common in Israel and protected there, and it differed from plants we had seen in other parts of the Mediterranean in having honey-coloured, instead of clear yellow, flowers.

Twice we drove to Jerusalem and Bethlehem, which is nearby – indeed merely a suburb of the capital. Jerusalem is a fine city with buildings in the honey-coloured local limestone, full of history and religion, but it is not the place to talk about that here. We did notice *Muscari neglectum* growing profusely as a weed in one of the parks and the endemic *Podonosma orientalis* established on the walls of the 'The Tomb of the Virgin Mary'. On our way we had seen the tall *Campanula rapunculus* which has been grown as a vegetable for its roots that taste rather like salsify, and a small flowered sort of Herb Robert, probably *Geranium purpureum*.

Driving out of Jerusalem eastwards, one soon comes into dry, rocky landscape, and by the time one goes down the escarpment to the eastern shores of the Dead Sea, it is the hot Judaeian desert. The vegetation here is sparse and unlike what we had seen previously, and it is difficult to identify most of the plants unless one is a specialist – most were not in flower. However, we recognised the flat-topped bushes of *Acacia tortilis* that gave the landscape the appearance of the Serengeti; perhaps not surprising, for the Jordan valley is an extension of the Great Rift Valley of Africa. The only other plants we recognised were *Atriplex halimus* which was, in places, parasitised by the giant broomrape *Cistanche tubulosa*, resembling a slightly smaller flowered form of *C. phelypaea* of the western Mediterranean.

However dead the desert seems, it is, in fact, full of life. Leopards live

there, and the lammergaier is seen occasionally and it is a migration path for many birds that use the thermals to help them on their way. We bathed in the Dead Sea and then made our way up to the fortress of Massada. At the car park, from where one can leave by cable car for the ruins, there were many Tristram's grackles, which look like blackbirds until they fly and then reveal a beautiful golden patch on their wings. They hopped around and squealed with delight over the rubbish left by visitors. Tristram was a Church of England parson and naturalist who lived in Zikhrom Ya'aqov. By the car park we noticed an elegant shrub *Calotropis procera*, a member of the Asclepiadaceae with a poisonous latex and a very likely candidate for the title of Sodom Apple. High up on Massada there were fan-tailed and brown-backed ravens, both of which are smaller and have shorter tails than the common raven.

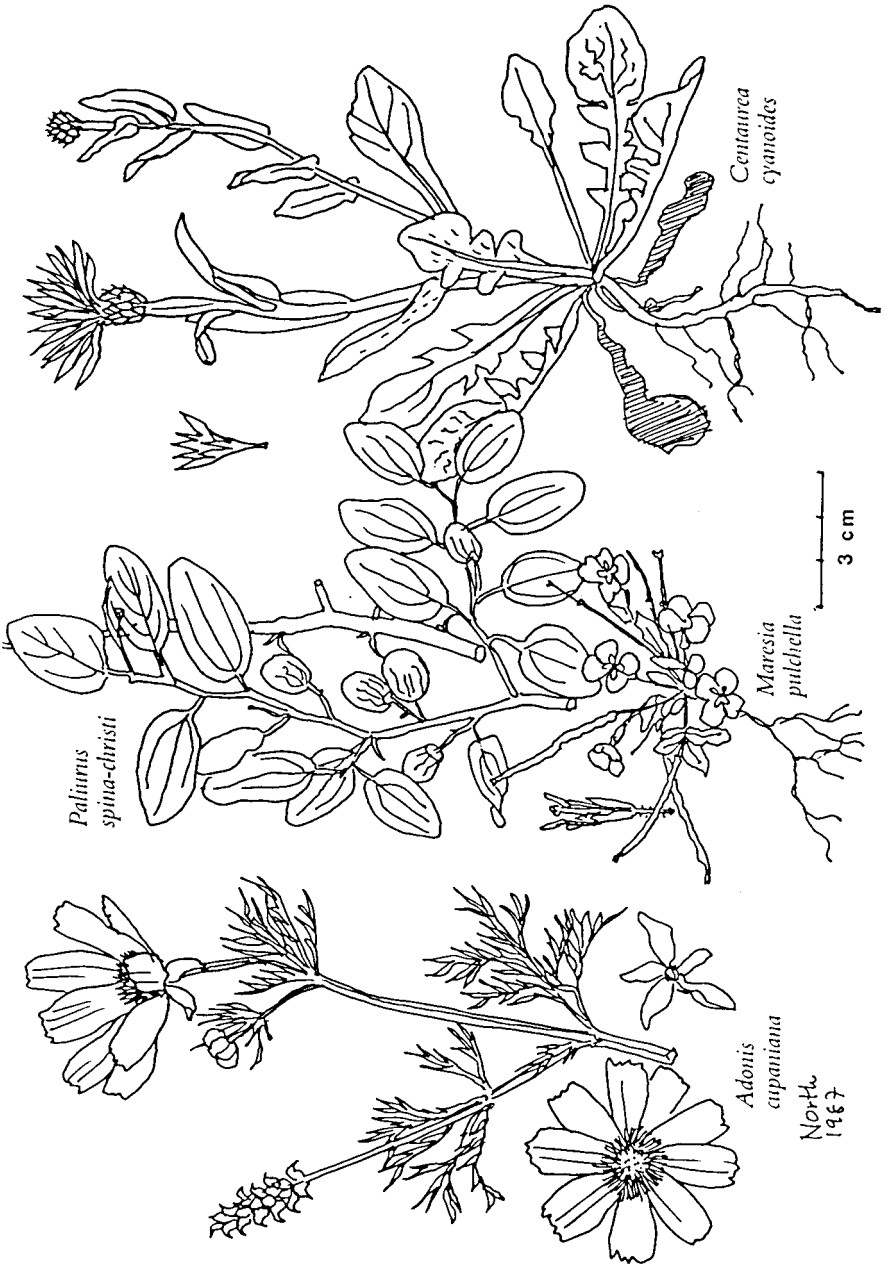
By now we were nearing the end of our visit to Israel. Two weeks is not enough to see such a varied and interesting flora and fauna, but we had encountered most of the plants we had been looking for. It was disappointing, however, not to find *Iris histrio* or *I. palaestina*, both of which are common here, but our visit was probably too late in the year for them. We would also liked to have seen *Tulipa sharonensis* and *Orchis israelitica* (similar to *O. boryi*), but we had done pretty well – especially in Galilee.

Israel is not like the image we had before we visited there. It is much more populated and there is far more traffic than we had anticipated. Indeed, driving was more tiring than in most parts of the Mediterranean, and for the nervous driver we would recommend joining an organised nature tour. If one decides, after all, to drive, then a really good road map is essential. The Israel Ministry of Tourism map supplied with hired cars is hardly adequate.

The address of the Society for the Protection of Nature in Israel is: 4 Hashfela St., Tel Aviv 66183, and ROTEM, Har Gillo Field Study Centre, 91076 Jerusalem, catalogue and co-ordinate studies on the flora. In our experience, do not expect speedy replies if you write to them.

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Centaurea cyanoides

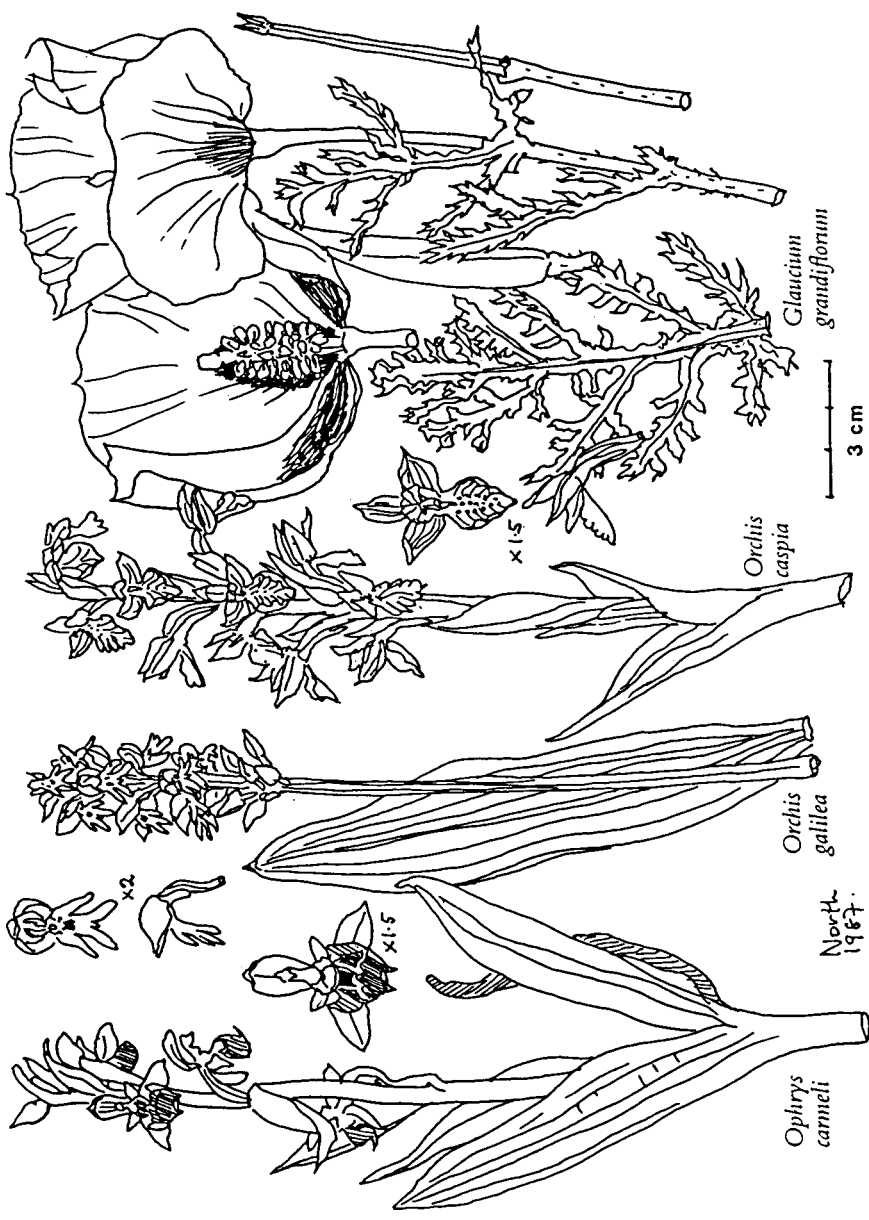
Paliurus spina-christi

Maresia pulchella

Adonis cupaniana

North
1967

3 cm



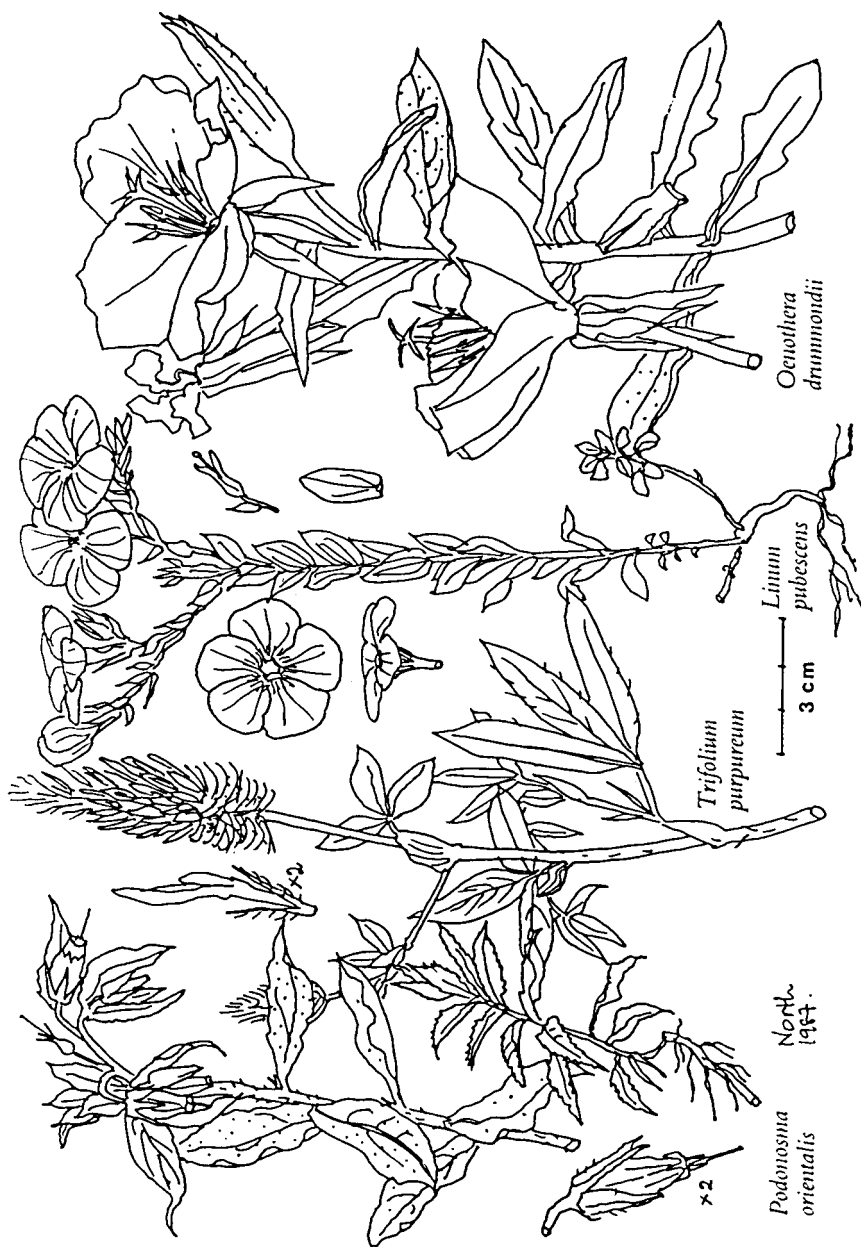
Glaucium grandiflorum

Orchis caspia

Orchis galilea

Ophrys cammeli

North
1987



Oenothera drummondii

Linum pubescens

3 cm

Trifolium purpureum

North
1967

Podosmosia orientalis

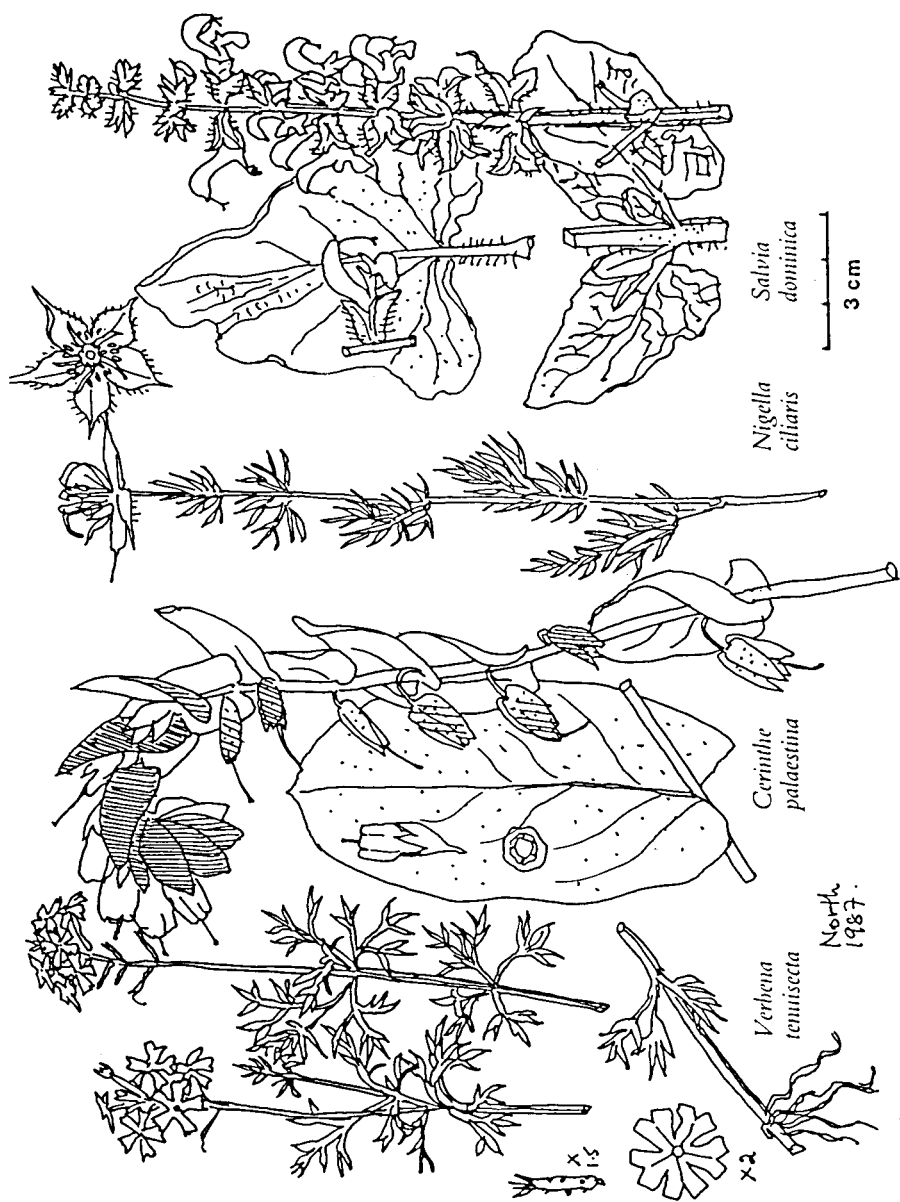




Fig 10 *Meconopsis* 'Sheldonii' (see p.86)



Fig 11 *Cruckshanksia hymenodon* (see p.85)

K. Gillanders

Fig 12 *Draba mollissima* (see p.83)



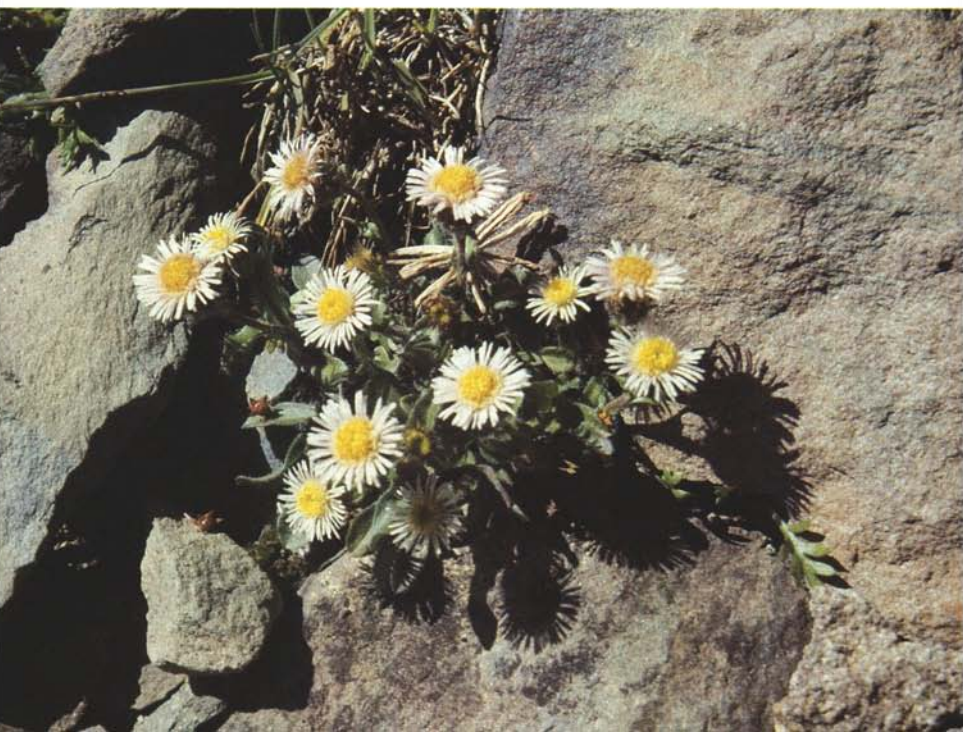


Fig 13 *Gaillardia aristata* (see p.16)

R. Simpson

Fig 14 *Erigeron compositus* (see p.18)

R. Simpson



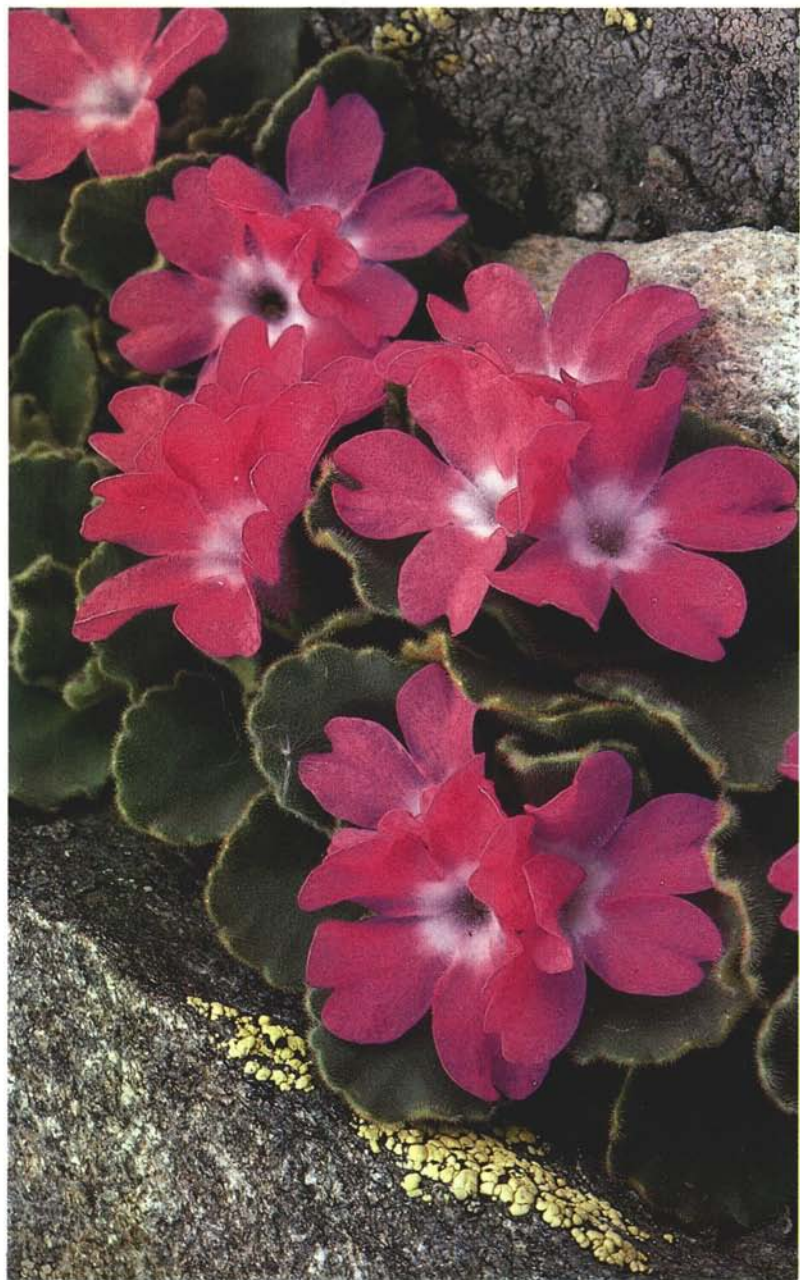


Fig 15 *Primula villosa cottii* (see p.84)

M. & H. Taylor

Indicator Plants

JAMES COBB

DURING TWO years that I spent in Australia I became very diverted by the lure of gold. The historical aspects were fascinating, but quite compelling was the urge to find gold. I am no geologist but I became engrossed in complex mining textbooks and it was there that I came across the concept of 'indicator veins' as a guide to rich areas of reefs. In practice I suppose the idea of indicators is embedded in most field activities whether formalized as a concept or not. The passage from granitic to limestone country would be marked by a change in plant species which are characteristic. The aim of this article is to present the idea of using certain types of plants to test various habitats within the garden and to indicate the most likely types of plant to place in them or alternatively to test new types of habitats before committing extremely precious plants.

To use this technique it is essential that you are a committed plantsman and thus interested in trying to grow plants that require more than average care and maintenance. There are two basic types of habitat to consider. The first is a situation created as a consequence of a programme to achieve a different objective. This may be the ground on the north side of a wall designed to grow fruit trees on its south side or the dry summer shade of a group of hazel (*Corylus* cultivars) planted for their fruit crop. In this sort of case it is a question of finding something that will grow given the particular microclimatic and other characteristics of each situation. Erythroniums and cyclamen both grow well in the latter which is characterised by a dense canopy and dry conditions in summer but plenty of moisture in spring and autumn. The second type of habitat is one that you have deliberately created to produce (or attempt to produce) a particular micro-environment with specific plants or types of plant in mind. Later on in this article we will consider what some of the microclimatic factors actually are but first it is necessary to consider what sort of plants can be used as indicator plants.

Many members will no doubt be aware that at the Club's shows there is always at least one class for new, rare or difficult plants which is eagerly scrutinised. Ideally indicator plants should be from among these but with certain provisos. The most important is that in general they should die slowly! This is not quite as insane as it seems since some

difficult plants succumb so rapidly to fungal infection, for instance, that you will learn very little in their mortification. There is an exception to this which introduces the next category and that is the occasion where you have abundant seed and a good germination of something rare. Under these circumstances it is necessary to raise a uniform batch of healthy seedlings under controlled conditions and establish them in individual pots with vigorous and healthy growth. If a substantial surplus of plants is produced they should be planted in as wide a variety of places as possible even if some of these seem pretty daft and a reservoir held back. My experience is that, once beyond the seedling damping off stage, many rare plants go through a period of rapid and successful growth and I think it likely that the physiology of such plants may well be very different to their adult status. This difference may relate to their resistance to infection or even quite radical differences in their adaptations to a particular micro-environment. I am sure *Meconopsis bella* is going to need quite different adult growing conditions from those that are increasingly successful for the seedlings. Holding back a reservoir has two purposes, one is that a successful environment may be fairly elusive and a modification of even the most successful is required or simply too few plants were initially planted in the best conditions. It is also likely some plants may establish better when grown for a longer period in pots until they have perhaps adopted their adult growth forms and strategies. Plants that I have used in this category have been *Paraquilegia grandiflora*, *Jankaea hedriantha*, *Dionysia aretiodes*, *Meconopsis sherriffi* and a number of Himalayan primulas. Sometimes in this category come completely new species from wild seed that are untried.

Related to the growing of good numbers of plants from seed is that of difficult plants that propagate easily vegetatively perhaps from cuttings. Some of the difficult phlox, *Campanula raineri* or even *Calceolaria darwinii* are examples. Another whole class of indicator plants have some sort of nutrient storage system rather than just having a fine fibrous root system as an androsace does, It is not just bulbs, corms or tubers although these are helpful, but plants like lewisia that are adapted to go into a period of totally dormant aestivation or hibernation. *Corydalis cashmeriana* is the archetypical plant of this kind since it is easy to propagate, dies slowly, has storage roots and is very desirable with a reputation for not being straightforward and coming from a region of many very desirable plants. Clearly whatever you choose as indicator plants has to be sensible in terms of the environment you are trying to create or modify, it's no use using *Lewisia tweedyi* as an indicator for monsoon plants just because you have lots of cuttings from them.

There are of course all sorts of related problems to bear in mind. Never forget basic principles of physics, particularly in relation to surface to volume problems. A small habitat will be subject to much faster changes in all sorts of parameters such as temperature and humidity than a large one. The reverse can also be a problem in that a really large habitat may take so long to respond to changes that one fails to achieve adequate control. Most serious of all is the "edge" effect and two examples will suffice as illustration. In a misted scree, a device I make much use of and will write about later, a three square metre bed has a dry perimeter and possibly an over-wet centre with a gradation of humidity in between. Placing plants in this can be critical down to as little as six inches. A second example as a 'rock' placed in a growing bed either as decoration or as habitat modification. The heat holding capacity of the rock varies to the cube of the radius and the radiant surface area to the square and thus the effective influence of the rock is critically determined by its radius and how much of it is buried. I find rock gardens difficult to make but Duncan Lowe's treatment of the subject in the last issue is a classic example of an article written by a man who has practical knowledge rather than a piece of repetitious professional journalism and is what makes our amateur efforts so valuable. There is no doubt that the effects of micro-climates deliberately or accidentally created in the garden are far more significant to small plants than many realise. It is also difficult to analyse the detail of these effects because a single rock will alter humidity, heat retention, wind speed and direction, and soil moisture, in which case all the more reason for the maximum number of plant indicators.

I have repeatedly found that plants become progressively easier as one proceeds from pots through small troughs to larger ones and this is mainly because the rate of change in growing conditions becomes slower with increasing volume of container and gives you, the grower, more time to intervene. I suspect that this is in fact the great secret of growing really rare and difficult high altitude plants such as many of the cushions. These plants need the care possible only with small pots but because of their susceptibility to rapid change they need constant attention and that intuitive feel for their welfare that is the essence of the very finest plantsman. I confess to having neither the time nor the ability which is why I am striving to produce specific habitats with longer term stability.

Another factor is growing in character-whatever that means. A major problem here is that one really needs substantial field experience of a range of a particular plant habitats. There is no doubt that this can be very illuminating. Once you realise *Lilium canadense* grows in ditches it

becomes an easy plant, but when you have grown it on from seed for a few years (carefully kept virus free) and it has thirty or forty flowers on a single stem, is it still in character? The paraquilegia that won the Forrest Medal in Edinburgh in 1986 was truly magnificent but quite unlike plants grown the hard way at Branklyn. I have plants of this species grown all ways and some are an order of magnitude bigger in a third the time when grown in a rich misted scree, but will they be frost hardy? There is also the problem that many plants have highly variable genotypes within the species and a batch of plants from one area may have very different responses to your micro-habitat compared with plants from the same species from elsewhere in its range. We are all familiar of course with clones of plants that are good growers and propagators but much less desirable in terms of form or colour. I suppose ultimately 'character' is a concept almost by definition subjective and all one can attempt to do with a difficult plant is grow it first and then try and produce an accepted image of it in character.

Leading on from this is the problem of 'runtism'. You will often find in a nest full of young birds a runt. This is true of many types of animals' offspring but it also occurs in plants, where it may be called 'dwarfism'. In many cases it is just a consequence of inadequate food supply with intense competition. However, this is not always so and I find for example that a significant number of meconopsis seedlings will not grow for any obvious reason and if sufficient care is taken of such plants (because they are rare) they do survive but stay runted. In the same way pot bound plants with grossly deformed roots are notoriously difficult to start back into normal growth once released from their confinement. I have no idea what is the cause of these phenomena but I suppose it is likely to be anomalous levels of plant hormones. This may be in the genotype or a response to a grossly un-natural environment. The main reason for raising this argument is that you must beware with scarce indicator plants or even scarcer rare plant material going into created habitats, that you are dealing with viable plants in the first place.

There is also the problem of unrecognised disease, particularly virus infection in vegetatively propagated stock. Recently meristem culture has cleaned up virus-contaminated stocks of highly desirable plants and the difference in growth in some cases has to be seen to be believed.

There are as well many factors which even professional plantmen have not come to terms with. An obvious one is plant mycorrhizal associations. There are those that claim that all plants form these relationships not just those groups like orchids of which we have some knowledge. I have no doubt in the fairly short term the significance of this phenomenon will increase in importance and an understanding of it

become important in establishing some kinds of rare plants. We have little enough understanding of such parameters as humidity and pH, let alone more obscure ones such as the effects of different wavelengths of the solar radiation spectrum in a garden situation. A petiolarid primula is going to have a totally different quality of light in the monsoon compared to a high altitude Andean plant. The late Col. Anderson was experimenting with ultra-violet radiation on the Andean plants of which he and his wife had acquired such a knowledge. Someone recently painted a picture of the 21st century alpine gardener with an indoor phytotron to grow their plants and was not happy about the idea, It is, to me, the logical conclusion for really intractable plants especially if rare or becoming so in the native habitat. It will produce far and away the most controllable experimentation of the type that I have been suggesting. Cheap computer control will eventually bring such systems into the hands of amateur plantsmen with the imagination to see their potential. If this divides those who love plants into plantsmen and gardeners more firmly, then so be it, there is strength in diversity and anyway, one can easily be both.

Finally you should remember that your choice of indicator plants depends on all of these considerations but especially your own geographical location. Ultimately, however, it will be what is available. As a postscript I did find some $\frac{1}{3}$ ounce of gold but I guess the gravel I washed to find it was worth a lot more!

A Balkan Journey: Part 2

MICHAEL ALMOND

FROM PELISTER we drove south into Greece and east, through the scorching lowlands of northern Greece, to the Aegean Sea. We turned west, uphill and inland again at Litohoro, towards the highest mountain in Greece—Olympus. The haze was so dense that the mountain was invisible from the main coast road and only just visible from the main square of Litohoro. We drove up to the roadhead at the “spring” (actually more like a waterfall) of Prionia (1100m) and left the car there in the late afternoon. We had taken the precaution of telephoning ahead from Litohoro to ensure that there would be a place for us at the Spilios Agapitos Hut (otherwise known as Refuge A) and we set off through the woods. Along the path above Prionia we saw *Jankaea heldreichii* (visible from the path but mainly over or inaccessible), *Cephalanthera damasonium*, *Dactylorhiza saccifera*, *Gymnadenia conopsea*, *Listera ovata*, *Neotinea maculata*, *Platanthera chlorantha*, *Pyrola chlorantha*, *Linum spathulatum* and *Daphne oleoides*.

The path was steep and the sun was hot, and we were very glad that a large proportion of the way was under the shade of trees—at the lower levels beech (*Fagus sylvatica*) or *Pinus nigra* (depending on whether the slope faced north or south) and at higher levels *Pinus heldreichii*. The path wound up the side of ravines and across remnants of snowfields before we finally caught sight of the hut perched on the top of a cliff up above us. On these upper slopes below the hut we found *Achillea ageratifolia*, *Aubrieta thessala*, *Daphne oleoides*, *Edraianthus graminifolius*, *Viola graeca*, *Saxifraga scardica*, *Orchis pallens*, *Gentiana verna ssp balcanica* (if you accept Strid’s classification) and some sempervivums. The climb had taken us about three hours and we were ready for the meal of soup, meatballs, potatoes, salad and retsina waiting for us in the kitchen.

Refuge A lies at a height of 2100 metres, next to one of the few sources of water on the upper slopes of Olympus. It is situated among pine trees but above it the woods thin out quite quickly. The warden Kostas Zalotas, has a copy of Strid’s *Flowers of Mount Olympus* which he will lend you on request—so there is no need to take your copy with you! The hut is a popular goal for all manner of oddly attired walkers,

strollers and trippers; and so it is advisable to check and book in advance as we did. Both Kostas Zalotas and his wife speak English and so you need have no qualms about ringing their number, which is prominently displayed in the offices of the Greek Mountaineering Club (EOS) in Litothoro.

The next morning we set out for the summit in fine weather. On the slopes above the hut and below the great cirque between the peaks of Mytikas, Skolio and Ayios Antonios we saw *Lotus corniculatus*, *Saxifraga scardica*, *S. sempervivum*, *Potentilla deorum* (with its lovely silvery foliage and disappointingly undistinguished flowers), *Scilla nivalis*, *Corydalis parnassica*, gagea and masses of *Gentiana verna ssp balcanica*. By the time we reached the ridge towards the saddle between the peaks of Mytikas (2917m) and Skolio (2911m), the clouds were behaving in a most disconcerting and unpredictable way, alternately blocking all views either up or down and revealing tantalising glimpses of summits, ravines and valleys. We pressed on up the loose scree that constitutes the ridge to the saddle. On our way we saw *Aethionema saxatile*, *Alyssum handelii* (an Olympus endemic), *Arabis bryoides*, *Galium anisophyllum*, *Ranunculus brevifolius*, *Saxifraga scardica*, *Veronica thessalica* (another endemic—a beautiful blue prostrate shrub) and *Viola graeca*.

From the saddle we had (when the cloud allowed) superb views up to the summits and down into the Megala Kazania (Great Cauldron) below them to the north; and also back down the ridge we had just ascended and across the cirque to the peaks on the southern flanks of the Olympus massif. On examining the route up to the summit of Mytikas (known as the *Kaki Skala* or *Rotten Staircase*) from close quarters we decided that discretion was the better part of valour and settled for an ascent of Skolio (only six metres lower). This was an easy scramble and had the bonus of even more stupendous views of the northern cliffs of Mytikas and its sister peak Stefani (the Throne of Zeus). Along the ridge up to the summit of Skolio we found a considerable amount of *Viola striis-notata* peeping up from among the soilless limestone scree in which apparently nothing else was able to survive.

Eventually we retraced our steps to the hut. As we reached it with an hour or two of daylight still left, we took the opportunity to explore the cliffs and ravines to the north of the hut. Here at some risk to life and limb, we found masses of *Viola delphinantha* (Fig.3 p.14), a little *Campanula oradeum* (mostly in bud still) and clumps of leaves of *Jankaea heldreichii*, with the buds just beginning to show.

The next day we walked down again to Prionia and then drove round to the northern side of Olympus, following the directions in Strid's

book. Although the forestry road was long and in places trying, the effort was well worth while. The cliffs at the side and the boulders in the bed of the Xerolakki Rema were festooned with *Jankaea heldreichii*, and most of it seemed to be in flower! In addition to the ravine we also found *Viola delphinantha*, *Edraianthus graminifolius*, *Aquilegia amaliae* (including one all-white flower), *Campanula oradeum* and what appeared to be a cross between *C. oradeum* and *C. albanica*. In the woods above the ravine we found *Daphne oleoides*, *Anthericum liliago*, *Pyrola chlorantha*, *Orobanche elatior*, *Cephalanthera rubra*, *C. damasonium* (finished flowering), *Anacamptis pyramidalis*, *Primula elatior* and one solitary fritillary seed head.

What we failed signally to do, however, was to make any real progress in our attempt to climb up towards the Megala Kazania from the northern side. We were beaten by the ravines and the forest which, as well as being difficult to move through, made it impossible to see where we were going properly. There appear to be no paths. We did find more jankaea and other flowers we had already seen lower down, but nothing new.

So we beat a retreat back down the forestry track, lined with the stately candlesticks of *Verbascum eriophorum* and the robust thistle heads of *Carduus thoermeri*. In the woods along the roadside we also saw *Cephalanthera rubra*, *Dactylorhiza saccifera* (including one white flower), *Listera ovata*, *Plantanthera chlorantha*, *Digitalis grandiflora*, *Lonicera etrusca*, *Hypericum olympicum*, *Daphne laureola* (in berry), *Primula elatior* (in seed), lots of large primrose leaves, an allium flower and masses of wild strawberries. We headed south for the Monasteries of the Meteora—an absolutely fascinating place but outside the scope of this Journal and too low down to have flowers of interest in early July. From here we drove up to the Katara Pass (1705m), which we had previously visited in May 1979 (see JSRGC xviii(1) no. 70 (June 1982) pages 49–56). Here we saw broomrape, arenaria, *Campanula ramosissima*, *C. sprunerana* (and other campanulas), *Dianthus haematocalyx* and *Helleborus cyclophyllus*. Among the box-scrub on the west side of the pass we found a number of specimens of *Lilium abanicum* and in the fields a little lower down there was a red haze of *Gladiolus segetum*. The stars of the Katara Pass, however, were the numbers of large bushes of *Daphne oleoides*, so completely covered in flowers that they looked rather like giant white puff balls.

From the Katara Pass we drove, via the picturesque mountain town of Metsovo (where a country fair was breaking up as we passed through) and the Lake of Yannina, to the villages of the upper Zagoria, on the southern flanks of Mount Tymphi. This was an area we had also visited

in 1979, but this time we explored a bit further. We found that the flowers in the thick pine woods clothing the lower slopes of the mountain were in their prime and at the roadside and in the woods themselves we found *Pterocephalus perennis*, *Putoria calabrica*, *Dianthus minutiflorus*, *Cichorium intybus*, *Centaurea salonitana*, *Lychnis coronaria*, *Orobanche elatior*, *Anacamptis pyramidalis*, *Cephalanthera damasonium*, *C. rubra*, *Dactylorhiza saccifera* and *Ophrys scolopa*. In particular the woods and stream banks near Yiftokambos were full of streams and damp hollows and (as well as tadpoles, frogs and a large toad) we found primrose leaves, strawberries, *Neottia nidus-avis*, *Cephalanthera rubra*, *Limodorum abortivum*, *Listera ovata*, *Platanthera chlorantha* and masses of *Pinguicula hirtiflora*.

On the upper slopes, above the villages of Vrisohori and Skamnelli, however, the season was already quite well advanced. Although we saw a number of interesting plants, including *Crocus veluchensis* and *Scilla nivalis* by the remains of the melting snow, many flowers (including fritillaries, of which we saw a large number of seed heads) were already over. We did see, however, *Achillea holosericea*, *Allium sphaerocephalum*, *Anacamptis pyramidalis*, *Campanula sprunerana*, *Dryopteris villarii*, *Euphorbia rigida*, *Geranium macrorrhizum*, *G. cinereum ssp subcaulescens*, *Linaria peloponnesiaca*, *Malcolmia angulifolia*, *Sedum dasyphyllum*, *Verbascum phlomoides*, *Viola graeca*, *V. riviniana* and masses of *Daphne oleoides*.

From the southern flanks of Tymphi we drove round to the village of Aristi on the west. From here we went first to Vikos and briefly explored the Vikos Gorge. This gorge, separating the massif of Tymphi from the foothills of western Zagoria, rivals the Samaria Gorge in Crete for the title of most spectacular gorge in Greece. Again, the season was well advanced and the only flowers of interest we saw were *Acanthus balcanicus*, *Campanula ramosissima* and *Pterocephalus perennis*. It was interesting to note, however, that cephalanthera was still just in bud and there might have been more waiting to come up in the shade of the oak woods. We also noticed that the cliffs beside the path down into the gorge were festooned with the shrivelled brown remains of ramonda which had finished flowering some time before, and which must be quite a sight in full flower. Most of the streambed of the gorge is dry at this time of the year but, just upstream from the little chapel below the path (staircase might be more accurate) down into the gorge from the village of Vikos, the water rises from the rock and forms the deep blue, crystal clear waters of the Voidomatis river. The water looks very inviting on a hot afternoon but is so cold that even a paddle becomes painful after about half a minute.

From Vikos we retraced our steps to Aristi and then drove down to the bridge over the Voidomatis, through the woods of plane that line the river bank at this point. We then wound up the hill on the other side, towards the great limestone cliffs known as the Tower of Papingo, and on up to the villages of Megalo and Mikro Papingo. On the way we passed a number of lizard orchids (the local subspecies, *Himantoglossum hircinum ssp calcaratum*) growing in the meadows at the side of the road. At Megalo Papingo, on the rocks by the church, was a fine group of *Campanula ramosissima*, with its bright reddish-purple bells; at Mikro Papingo, by a tomb at the road junction below the church, was a superb stand of *Lilium candidum*—a plant which grows wild in the area but which we had not seen.

From Mikro Papingo it is an easy, if long, climb up to the hut on the ridge below the summit of Astraka. Again the season was well advanced and the only flowers of note were *Daphne oleoides*, *Eryngium amethystinum*, *Helleborus cyclophyllus*, *Pteroccephalus perennis* and some small varbascums. From the hut one has a superb view out over the intervening valley with its shallow lakes (the Tsani Tsoumani) to the central mass of Tymphi, Mount Gamila. The descent to the Tsani Tsoumani takes about half an hour and growing in the scree along the path were *Astragalus angustifolius*, a lilac centaurea (perhaps *C. ahtarouii*), *Geranium subcaulescens*, *Globularia bellidifolia*, *Saxifraga grisebachii*, *Veronica prostrata*, *Viola graeca* and an aubrieta. There was no sign of gentians or anything else much on the turf in the valley bottom but it is extensively grazed and it is likely that there would be more of interest earlier in the season.

From the valley floor it is a climb of about another half hour up a steep grassy (and also heavily grazed) hillside to the little lake of Dracolimni, nestling below the cliffs of Gamila and within ten yards of the great vertical cliffs down into the Aaos Gorge some thousand metres or so below. Near the lake there were growing aubrieta and a beautiful dwarf but large-flowered yellow and dull pink scutellaria (?). This small lake is echoed by one of the same name on Mount Smolikas (the second highest mountain in Greece, at 2637m), in full view on the other side of the Great Aaos Gorge. The name Dracolimni means Dragon Lake and legend has it that in the dark blue depths of each there used to live a dragon. There were very quarrelsome neighbours and the one hurled tree trunks from Smolikas at his rival while the other retaliated with rocks and stones from the bare Gamila.

So we left the bare Gamila and turned our attentions next to the wooded flanks of Smolikas. In the woods on its southern side, with a superb view across the Aaos Gorge of the peaks of Tymphi we had so

recently left, we found *Gentiana cruciata*, *Anthericum liliago*, *Iberis pruitii*, *Cephalanthera rubra* and epipactis in bud. We decided, however, that, in view of the lateness of the season and the relative scarcity of flowers on neighbouring Tymphi, that an attempt on the long haul up to the summit was not worth the effort.

We drove across northern Greece, often within sight of the mountains on the Albanian border, to the picturesque town of Kastoria, with its dozens of Byzantine churches, its fascinating old mansions and its beautiful lake. The roadsides on the way were mostly dry and bare, but we did see *Campanula lingulata* and brilliant patches of *Dianthus haematocalyx* by the roadside. From Kastoria we climbed north to the shores of Little Lake Prespa and to Lake Prespa itself (in which, from the Yugoslavian shore, we had bathed two weeks previously). We watched the pelicans flying in to their nests in the bird sanctuary and we saw *Campanula persiciflora*, *Lychnis coronaria*, *Legousia speculum-veneris* and primrose leaves growing by the roadside. From Prespa we went over the hills (the southern extension of Pelister), through thick mist and past damp meadows red with *Dianthus giganteus* and roadside verges flushed with *Lychnis coronaria* to Florina and the Yugoslav frontier once again.

Because summer was now well advanced (and we were not travelling to high altitudes) the drive back up through Yugoslavia, although full of interest from the many towns, villages and medieval monasteries that we visited on the way, had little of botanical interest before we reached our "rest day" on Mangart in the Julian Alps (which do not really count as "Balkan"). The exception was our walk up the Treska Gorge, south of the Macedonian capital of Skopje. As well as the medieval monastery of St Andrew (Sveti Andrija or Matka Manastir) we had read that the gorge contained a rich population of *Ramonda nathalii*. Sure enough, as soon as one's eye was tuned into what to look for, it became apparent that the walls of the gorge near the church were festooned with the dried-up brown remains of masses of *Ramonda* that had flowered some time earlier, together with some rosettes of *Saxifraga grisebachii*. There was nothing to see of the flowers, of course, which was perhaps just as well as photography is strictly forbidden because of the hydroelectric plant nearby.

Although we had not seen all we wanted to see (do we ever?), largely because of the vicissitudes of the weather and the lateness of the time of year (particularly in Greece), we had had a most rewarding and varied Balkan journey—one that would certainly whet our appetites for further, more extensive exploration in the future of this fascinating area, so unlike the stereotyped picture we tend to have of countries like Yugoslavia and Greece.

Plant Portraits

Cypripedium calceolus

Richard Sullivan

The front cover of this Journal shows a group of Lady's Slipper Orchids warming their faces in the early morning sun. It is a strange place to find them on these open screes within earshot of avalanches tumbling from the Eiger Glacier, right at the foot of Jungfrau (4,158m). The nearest trees are at least 200m away, which is most surprising as normally these glorious orchids are denizens of dappled leafy woods.

It was the highlight of our two-week holiday to find these plants in flower, and we were most fortunate for it was the last day. We had been staying in Wengen, one of the most beautiful centres for hillwalking and botany in Switzerland. A member of the AGS and SRGC had told us about these orchids, and so on the first day of our holiday we walked to Wengernalp and from there took the path to Biglenalp. There is a foot-bridge across the icy stream at this point and on the far side is a mountain hut. From the mountain hut we headed straight for the clump of pine trees that lay between us and the cliffs. On the far side of these trees the ground was quite wet and there was a ridge of glacial deposit beyond. It was there on the ridge that we first saw the orchids, although at that stage they were not in flower.

We calculated that at least two weeks would be needed before blooming and, sure enough, when we returned at the end of the first week in July, we were greeted by this spectacle. There were at least 50 clumps in flower and, strangely, they were the tallest plants around – no chance of shade. It was also swelteringly hot, and I would suggest that they would fade much quicker than their woodland cousins. Michael Upward relates the story of the botany class making an annual pilgrimage to the site to sprinkle rotting wood-chips around the plants to help preserve the fungi on which the orchid symbiotically depends, now that the natural woodland has retreated. The soil would be kept moist and yet well-drained at all times by the ice-melt. And so here the orchids dance for a few days among the dryas and globularias, lovingly watched by a few alpine gardeners . . . I would even go so far as to say that 75% of the people you would meet on that ridge would be rock gardeners.

Draba mollissima

Alfred Evans

Draba mollissima was first collected around 1806 in the Caucasus. The area lies between the Black and Caspian Seas just north of Tiflis on Schadagh in the region of Dagestan (which means mountain country). The collector's note simply states – 'on rocks, flowering in June'. Dr Giuseppi saw it there in 1935 and said it was among the best of alpinas (see AGS Bull. No. 4, 1936).

Both in nature and in cultivation it forms dense cushions and these are made up of numerous tiny growing points. The small leaves are thickly covered with fine, whitish hairs giving the plant a woolly appearance. From each rosette the flowering stems arise in spring, extending to one inch or thereby, each carrying six or more bright yellow flowers.

Draba mollissima is one of those attractive dome-forming plants seen at early spring shows. It is not difficult to cultivate in pots but presents problems if planted out of doors. It is possible to establish in a scree, trough or raised bed, but then precautions have to be taken during prolonged wet weather – in autumn as well as in winter – since the cushions can act like sponges and subsequently rot.

The illustration accompanying this note (Fig.12 p.68) shows a 30-year-old plant in full flower in a 12-inch clay pot. This specimen was presented to the Royal Botanic Garden, Edinburgh, by Mr Esslemont, Aberdeen, in 1974 when it was 18 years old, and since then has grown much bigger and been potted on until it is now in its final pot, I should think. Are there suitable larger clay containers, and if so would someone dare to disturb such a superb specimen? The compost in which it is growing is an extremely gritty one of equal parts by bulk of J.I. Potting Compost No.3 and chicken grit. When potting on, the outside of the root-ball had some of the compost gently removed and then, after a clean pot had been suitably crocked, the plant depth was measured so that once it was placed within the pot the top of the root-ball was approximately 2cm below the pot's rim. Keeping the plant steady and upright in the centre of the new clay receptacle, compost was then trickled down the sides and firmed quite well so that although water drained away freely it was not so loose that it did not run through as though nothing was there. It had to be firmed enough to encourage some water to move laterally so that the centre of the root-ball was moistened, too. Bottom watering, I know, is recommended, but with plants of this size it is not always practical. Following the potting, a thin dressing, about 1cm, of the coarser turkey grit was added, for this not only helps in the presentation of the plant but also discourages excessive moisture from lying in the neck of the cushion.

In winter the plant can be mistaken for dead, since the rosettes can become quite dry and brown, but, with advancing spring, the centre of each rosette becomes green and, soon after that, the whole plant is verdant with young growths and flower buds.

This is the same plant that was awarded a Forrest Medal at Perth in 1974 and a Farrer Medal at Newcastle in 1985

Primula villosa cottia

Margaret and Henry Taylor

This highly desirable plant (Fig. 15 p. 70) flowers freely outdoors in April, when grown in full sun in our sandy soil enriched with farmyard manure. The leaves are attractively covered with a down of yellow hairs as it belongs to the Erythrodosum section of European primulas, which name, according to a friend who is a connoisseur of such things, is derived from the Greek erythro (red) and drosos (soft hair on the chin of a boy).

In the garden the illustrated clone remains dwarf with a flower stem less than 2cm tall. Fortunately it makes a clump that can be split apart, not a thing you might expect from the *P. villosa* clan which, as we have seen it in the wild, usually grows as scattered individuals rather than spreading mats like the related *P. hirsuta*.

I suppose we should now consider the name. Should it be *P. villosa* or *P. villosa cottia*? In general, *P. villosa*, as found in Austria, has fairly narrow, upright leaves and a flower stalk several centimetres tall. Whereas 550km away, in the Cottian Alps of north-west Italy, the plant has shorter flower stems and broader leaves which lie flat on the rocky surface; slaty, slippery schist with plenty of moisture on the day of our visit. As gardeners, we prefer the earlier splitter botanists rather than recent lumpers and think it worthwhile to retain the name *cottia* to identify the Italian form.

No doubt there is some overlap between these two types as there is great variation in leaf and flower within both areas, but an added complication was noticed in the Italian site. Setting off from the end of a derelict military road, we were overjoyed to see our first *P. villosa cottia*; a few steps farther and we came across *P. latifolia* and then some intermediate primulas. Gradually we began to doubt the existence of any pure species on this northern slope. Come to think of it, there are fancy names for many European hybrid primulas. Farrer, Widmer and Gusmus didn't seem to have been here, so why not *P. x chalansa* for this natural hybrid? The local name for the mountain is Chalansa. Later, after climbing over a pass on to a south-west face, there was no evidence of *P. latifolia*; the only primulas seemed pure *P. villosa cottia* and it was in this region near 2,800m where the photo was taken on 30 June. Females sometimes require a little

prodding before venturing up precipices in the mist, but we both agreed that the summit plant was worth the nine-hour hike.

With primulas in the garden, hybridisation can cause even more of a muddle. Enthusiasts tend to grow more than one species and bees are not too particular, so seed collected in the garden is more than dubious. For a better chance of acquiring the genuine article, search in the wild-collected section of the seed exchange and keep your fingers crossed for the next three years until the plant flowers.

Cruckshanksia hymenodon

Ken Gillanders

This member of the family Rubiaceae is native to the southern Andes and is one plant that, once seen in its natural habitat, will never be forgotten. I had the opportunity of doing this in February 1987 and, although having read of it, no writing or black and white photograph can prepare one for the beauty of this flamboyant plant.

It forms 30cm compact mats of rather succulent grey-green leaves, reaching up to 5cm high. The clusters of five petalled star-like flowers, which can number from six to ten or more, have a similarity to its relative *Oreopolus glacialis*. When first opening they are a rich yellow, suffused with orange, but fade to a lemon-yellow. The pink bracts that cluster around the base of the flowers are deep rose-pink at first but as the flowers mature, they increase in size to 2cm or more and fade to a silvery cream with a pink flush and have a papery texture. Flowers seem to be produced over a period of time, as spent flower heads with seed and flower buds developing were seen on the same plants.

The plant in the accompanying photograph (Fig. 11 p.68) was growing in the same area as visited by the C & W expedition and later by Col. and Mrs J. Anderson, which was at Lagunellas, 70km south-east of Santiago.

At 2,500m, this area of the Andes, although appearing rather stony and bare, is well populated with a variety of herbs and bulbs. The summer period is very dry and temperatures in the day are as high as 30°C. In the winter this area would be under deep snow as it is well above the top of the ski runs.

Obviously *Cruckshanksia* has a central root system that grows very deeply, otherwise it could not survive in such harsh conditions. The soil it was growing in was quite gritty and from its appearance would drain quickly.

Seed was collected, as we were fortunate enough to find some plants that had ripened and set seed. On returning home, three weeks later, we

sowed three different lots of seed in basically the same soil mix. This was 4 parts coarse sand, 2 parts granulated styrene foam, 2 parts soil and 2 parts 5mm stone chips. One was placed in the refrigerator, one left on the open glasshouse bench, and one had boiling water poured over it and put outside under shadecloth. The results, now twelve months later, are as yet inconclusive. The pot placed in the refrigerator was removed after about three months, but no germination has taken place at all. The pot treated with boiling water and the one left on the glasshouse bench, have both produced two or three seedlings, which have been unable to extract their cotyledons from the seed vessel and have died. After about eight months, one more seedling has emerged and has been able to throw off its seed coat. This now has six leaflets and is 2cm high.

Many of the seeds in the pots are still alive, as I also tried nicking the seed coat of some of the seeds in an effort to get germination. This, unfortunately, has not had any effect on those treated but every seed nicked appeared to be fertile. In addition to the treatment mentioned, all pots were submitted to periods of prolonged light under fluorescent lamps and some to periods of darkness by placing under black plastic.

It is obvious that we have a lot to learn about this plant. I would be interested to hear from anyone else who has had success with it.

Meconopsis x 'Sheldonii'

This meconopsis is usually thought to be a hybrid between *M. betonicifolia* and *M. grandis*.

It is one of the easiest, most attractive and long lived of all meconopsis. Reaching a height of at least two metres in good soil, its pure blue flowers are around 10cm in diameter (Fig.10 p.67). It appreciates good rich deep soil, which is not stagnant, where it will continue to produce its splendid flowers for many years. Hardiness is not in question as it will stand any amount of cold. The only possible enemy is summer drought so that in dry areas it should always be placed somewhere that retains moisture.

It is usually sterile but, as Jim Cobb reported in the SRGC Journal XX, 158 (1987), it does occasionally produce viable seed. But since it is not only long lived but also easy to propagate vegetatively there is no need to worry about lack of seed. Clumps can be lifted in spring when the shoots are about 15cm high, split apart with a fork and replanted.

A single plant can soon produce a large border of blue poppies which during May are a sight to behold. This must rank as one of the finest herbaceous border plants for moist cool parts of the UK. Gardeners in the south of the country will just have to travel north to see it in its full glory.



Fig 16 *Ranunculus muelleri brevicaulis* (see p.37)



Fig 17 *Delphinium brunonianum* (see p.93)

G. Kirkpatrick

Fig 18 *Cremanthodium* sp. (see p.90)

G. Kirkpatrick



Barabangrahal, over the high Himalayas

GEORGE KIRKPATRICK

TO QUOTE West Himalayan Holiday Tour Company, this is the connoisseur's choice. You should be reasonably fit; though no climbing experience is required, it should be remembered that these high passes can be challenging. They were not kidding.

We departed for Himachal Pradesh, North West India, on 4 September 1987, flying over USSR, Afghanistan and Pakistan, arriving in Delhi early Saturday morning. From here we took an internal flight to Kulu, a rich agricultural valley noted for its apple orchards. The last leg of the journey was by taxi an hour and a half up the Kulu valley to Manali, our staging post for the trek.

Manali

Manali is a small market town which straddles the Beas river valley at an altitude of 2,200m. Until comparatively recently it was the end of a motorable road and thus a bazaar for mule trains carrying goods to Lahoul, Spiti, Ladakh and even Tibet. Now a road goes over the Rhotang pass into Lahoul, but the bazaar is still an important centre for sending goods north by truck and mule and forwarding seed potatoes and wool south. In recent years Manali has grown as a tourist centre for Europeans and for Indians escaping from the heat of the plains. A large part of the population moves down from Manali in winter as the snow will often lie more than one metre deep in the village. Most of the shopkeepers in the bazaar are of Punjabi, Lahouli and Tibetan origin; the Kuluis are not usually drawn towards trade, being content to farm their own small areas of land.

The first day was designated as a rest day. After little discussion we hired a jeep to take us up the Rhotang pass at 4,500m (the area I visited the previous July). A tortuous twisting, turning road that last year has only just been opened was now clear of snow even at its summit. Here my local knowledge proved invaluable and whilst the other members of the trek wandered about the slopes, I made straight for *Bergenia stracheyi*, *Primula involucreta*, *Epilobium latifolium*, *Meconopsis aculeata*, *Cortusa brotheri*, *Primula minutissima* and the chocolate coloured pea *Thermopsis barbata*; what a haul in the space of an hour and a half.

The beginning

Our party consisted of 6, four men and two women, of mixed nationality and very different backgrounds and ages. To take care of our every need we had 20 ponies to carry all our food and equipment, plus 8 porters, a cook and 2 guides ably led by Captain Padham "Paddy" Singh.

Day one began around 8 am with a gentle walk after breakfast through *Cedrus deodara* forest, past the Banon memorial for the dead of the First World War. (The Banons were the first Europeans to settle in the area; descendants of the original settlers still live in Manali.) A steep hot climb past *Arisaema jacquemontii*, *Iris milesii* and *Anemone rivularis*, even Paddy was sweating; this is the easy part! Hard going, with thankfully an early camp amongst *Betula jacquemontii* and *Quercus* woodland with *Caltha palustris* var. *himalensis* growing profusely in the damper areas around the stream and *Trillium govianum* in the deep leaf litter of the woods. Soon, smoke lingered with the evening mist and we sat around a warming fire and appetising meal, thoughts of aching limbs and heaving chests now a mere memory.

The next morning we awoke to a misty bleak camp site. After breakfast (muesli, eggs, chapattis and jam) the terrain proved steeper and more treacherous than the previous day due to the overnight rains; even the ponies had difficulty negotiating one particularly narrow, steep point through *Rhododendron campanulatum* and birch scrub. Altitude was a little over 3,600m, breathing difficult, rest stops and drinks frequent. At this point I wanted to turn back but all was heaven and a light heart by mid afternoon. Our reward for the exertion and pain was glorious panoramic views of the valleys below, of snow-topped peaks yet to come and the myriad of *Cremanthodium* sp. (Fig.18 p.88) and *Cyananthus lobatus* all around us. We descended through the rain to the camp site after first carefully negotiating our way around a herd of browsing buffalo, a notoriously unpredictable beast of burden.

By 6.30 pm a cup of steaming hot soup appeared followed by a dinner of rice, potatoes, meat and fresh vegetables. Wherever possible the meal was taken around a warming log fire as at these altitudes the temperature had dropped considerably. More often than not we were all in our sleeping bags by 9.00 pm, which proved very difficult at first to get used to, especially if one is not accustomed to sleeping on the ground, as I was.

The next morning turned out to be the worst day weatherwise, it absolutely poured down. We spent a cold miserable morning under canvas with horse blankets over us, trying to keep warm. The day's trek was abandoned, no point in getting wet, the track would be dangerous, better wait it out here. By early afternoon the sun had broken out and I was able to collect seeds of *Iris kemaonensis* and clean the seeds of the previous day's finds.

Friday 11 September, one week had passed already. A very early start to the day; by 8.00 am we had our water bottles filled and were on the move. Four griffon vultures lurked in the nearby trees eager for us to depart so they could swoop down and devour the carcass of a dead beast not a hundred yards from our camp site. As we moved off they moved in. This was the start, a real test of stamina; by now we were all much fitter than we were in the first agonising days and more accustomed to the rigours of the day and the altitude. How wrong I was.

The route up to the Kali Hind pass at 5,200m began gently enough in open meadow, even dropping into a valley before fording a small river, then a steep climb on the other side into mixed woodland. The shade of the forest was most welcome in the mid morning heat, into meadowland once more, passing swertias, *Iris*, *Cyananthus lobatus*, *Anaphalis* and a Gaddi's house for the first time. A Gaddi is a local shepherd who leads a nomadic existence following his sheep and goats in search of grazing, spending one or two nights in these small stone houses before moving on.

Waking to a frosty camp site at 6.00 am, the peaks of Indra Sen and Deo Tibba in the morning light did little for me, my thoughts were on the warming fire. At this stage of the trek, the group doctor, Chris, who was already suffering from Delhi belly, Montezuma's revenge, call it what you like the result is pretty much the same, developed altitude sickness as did his wife, Kate. To climb over snowfields and the pass ahead when one is fit and well is not easy, imagine how they felt; it was not a day for the faint-hearted. We reached the summit of the pass around 1.00 pm, a long, hard climb. Whilst the porters placed flowers on the prayer cairn of stones, we ate biscuits and cheese, overlooking broad glaciers and the moraine of the valley floor awaiting us. To alleviate our companions' altitude sickness, it was necessary to descend another 1,000m across snowfields and bridges, through a deep gorge with huge boulders resembling a lunar landscape with very little sign of vegetation. At the end of the day it was not Chris's feet which hurt, he had spent most of it on a pony.

The following day (Sunday), no lie in, on the trail by 8.15 am, continuing down the rugged valley across precarious log bridges, passing herds of resting sheep and goats. By mid morning we began to climb upwards again, gently at first then more steeply through juniper scrub. By lunch-time we were on the crest of the ridge, able to look back and ponder at the snow-covered pass crossed only yesterday, already far in the distance. We stopped early, around 2.00 pm, overlooking the Ravi river, the steep hillsides opposite clothed in *Betula Jacquemontii*, twisted, glistening sticks clinging to life in this most hostile environment. A poor day plantwise with only *Podophyllum hexandrum* and two species of *Lonicera* being collected, one with small red fruits, the other with blue.

Monday, rest day and a chance to clean and dry the seeds already collected, to change the drying papers on the herbarium sheets, catch up on notes, take photographs and finally laze about.

Off again early, over similar terrain, traversing the grassy hillside, following the goat track down through knee-jarring twisting woodland to our first sign of habitation for days, Barabangrahal village perched on the hillside above the river. Our tents were pitched literally feet away from the river's edge, the only flat area available; so close to overflowing was the river that we were afraid it would burst its banks during the night. However, it didn't and we were all grateful for its accessibility, making full use of it the following day to bathe, regardless of the cold temperature. The village of wooden houses is in fact two separate villages, high and low Barabangrahal, presumably because one is set slightly higher and further up the hillside. Its people are friendly and hospitable and when they learnt we had a doctor with us, surgery was arranged for 10.00 am the following morning. One small boy of about eight required immediate attention. He'd hurt his leg in a fall several days beforehand and it had become badly infected. The wound once cleaned was almost down to bone; he became a local hero, with school friends and relatives looking on, he showed little signs of distress as medication was being administered, though the pain must have been intense. With the wound cleaned and dressed he walked away with barely a limp, to return the following morning for more treatment. I can only hope that by now he has fully recovered; ours was the first doctor the villagers had seen in two years.

After a day's rest, a steep hot climb out of the Ravi river valley following the route out of Barabangrahal, gazing backwards over the terraced slopes of maize, rice and potatoes, no local supermarket here, just hard work. Past *Berberis*, *Spiraea arcuata*, *Juniperus*, *Cotoneaster microphyllus* and a single *Viola* plant with purple flowers. We camped early, near water in the midst of sheep and goats; on the slopes grew *Betula jacquemontii* and *Rhododendron campanulatum*, in the dry riverbed *Sedum ewersii*. Little else but grass could compete with the voracious hordes. Whilst we rested, the porters were sent out in search of enough firewood for two days, this was the last chance of gathering wood before our ascent over the Thamsar Pass.

Another short day's climb to a camp site below the pass, it proved to be a good area for collecting, with *Primula minutissima*, *Gentiana venusta* seeds in abundance and amongst the boulders of the riverbed *Waldheimia stoliczkaei* was in full bloom, its pink and white daisy-like flowers on silvery green foliage. A cold night and overnight frost, at 4,500m you expect sunshine and showers already!

An early morning start, the flocks moving south are well on their way by first light to climb the pass. It's not as steep as the Kali Hind pass but

it's a long pull past a glacial lake of deepest blue to the ridge. On the north side of the pass we had crossed snowfields, now on the south side it was dust dry with *Delphinium brunonianum* (Fig.17 p.88) by the hundreds growing in the dry slopes, pale blue and green against sulphur yellow earth with not a seed in sight. Only yards down the slope cremanthodiums, a species of 10-15cm high, growing in the powder dry earth, their yellow sunflower-like flowers nodding jauntily in the sunshine. The porters seeing my delight at this second great find of the day joined me in picking the fluffy white seed heads and very soon I had several bags stuffed full of this little treasure. The hillside gradually became greener as we descended, with *Cyananthus lobatus*, *Iris kemaonensis*, *Androsace sarmentosa* and amongst the dry rocky areas *Sedum ewersii* was to be found. At this point I had to run to keep up with our guide as we had fallen far behind the others in my efforts to collect seed and photograph as much as I could. I say "run", on a grassy slope it's often harder to stop than to keep going, especially carrying a rucksack.

Sunday 20 September, the latter stages of the trek, first down a rather bleak riverbed over snowfields with *Swertia* sp., *Primula rosea*, *Meconopsis aculeata* and *Cyananthus lobatus* on the grassy slopes. Into mixed woodland with *Rhododendron*, *Rosa*, *Hypericum*, *Viburnum* and *Bergenia stracheyi* clinging to moist shaded rocks, finally to our camp site at Palachok.

A day's rest, time again to catch up on notes, seed cleaning and even time for sunbathing.

Refreshed and clean, off once more into the foothills through woodland, fields and villages with men cultivating the land with buffalo, past *Parochetus communis*, its blue pea flowers hiding in the short grass, through *Indigofera* scrub down to our next camp site at Biling, high on a bluff looking out on the verdant, fertile Kangra valley. During the night there had been a violent rainstorm; in the morning we awoke to the usual "bed tea" and a view of the snow-covered Kali Hind pass so recently crossed.

The last days

A steep descent through *Rhododendron arboreum*, *Quercus* sp., *Pinus* sp., past a young girl gathering wood resting in the shade before continuing her homeward trek. By lunch-time we had reached our goal, the Tibetan encampment of Bir. From here, by bus, to the Palace Hotel, Taragarh, owned by the Maharaja of Kashmir, built in the style of a 1930s country house and now in need of repair, but a hot bath and a meal fit for any king revived even the most jaded spirit.

Friday 25 September, our farewells said to the porters and ponymen, we boarded our bus for a 9-hour drive to Chandigarh and our connecting flight to Delhi and then home.

Acknowledgment

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Show Report

Discussion Weekend

BEARSDEN, 19 SEPTEMBER, 1987

IT is interesting that most members find themselves approaching the Discussion Weekend autumn show in a different frame of mind from a spring show. The beauty and the quality are there, but softer and quieter and indeed redolent of the end of a season. The eyes scanned the benches for the gentians and were not disappointed. The deep blue of *Gentiana* 'Drake's Strain' and of *G.* 'Kidbrooke Seedling' enhanced in the three pan class of Mr and Mrs V. Chambers by *G. sino-ornata* var. *alba*, overflowing its pot into a 45cm-wide mound of slightly green-tinged white, and a worthy winner of the Peel Trophy. In complete contrast was the Forrest Medal-winning *G. depressa* in Mr Alan Spenceley's East Lothian Trophy trio, neat and restrained not only in its delicate colouring but in its squat cups sitting neatly on the squared-off foliage rosettes. More characteristically autumnal were several plants of *G. ternifolia* with upright, rather narrow cones of flower strongly striped dark on pale blue. This species seems firmly settled in cultivation, having been introduced from the Cang Shan range of western Yunnan as recently as 1981. The tubby-belled form of *G. ornata*, now becoming available from several recent reintroductions, was being duly admired and perhaps leaving the occasional botanist amazed at the selective predilections of the rock gardener. Still, it is a lovely thing.

The show was considerably brightened by the large number of silver foliated plants shown, not only in the three classes specifically for them, but right across the benches. Mr Harold McBride's skill with these plants helped him to the Mary Bowe Trophy for the exhibitor gaining the most open section points. In the silver foliage two pan class he contrasted the hummock-forming *Helichrysum confertum* with the flat mat of *Veronica bombycina*. His *H. selaginoides*, grown from seed, was outstanding, but the silver fern, *Cheilanthes eatonii*, and the 18cm-high silver stems of *Eriogonum croactum*, both American natives, completely overtopped the beautiful needle-foliaged silver mat of *Celmisia argentea*. *Celmisia sessiliflora*, shown by Mrs S. Tindall and winning her the East Lothian Cup for the best plant in Section II, is not only larger in every way than *C. argentea*, but holds its needle-like foliage in spiky rosettes, building up a hard mound with, in due season, absolutely sessile, large white daisies.

Raoulia hookeri was shown with light green, yellow tufted flowers by

Margaret and Henry Taylor, who coupled it with the diminutive natural hybrid *R. eximea* x *petriensis* from the Grampian Mountains of New Zealand's South Island. The dwarf shrub class was enlivened by the stark silver branches of *Calocephalus brownii*. This Australian shrub was some 35cm high by 20cm across with vestigial pointed leaves only 4mm by ½mm wide and with yellow composite flowers on 3mm long side branches turning to larger seed heads. It was accompanied on the show bench by the Tasmanian *Trococarpa thymifolia* with equally small but very dark green leaves packed closely along wiry branches.

Certificates of Merit were awarded to two fine ericaceous shrubs, both favouring far northern conditions in the wild and adopting low growth to avoid the winds. Mrs Carol McCutcheon staged *Cassiope lycopodioides* with leaves pressed tightly against the stems which weave an intricate horizontal pattern on a sunny peat bed. *Harrimanella stelleriana*, until quite recently also in the genus *Cassiope*, is distinguished by its thinner though still tiny leaves held slightly away from mainly vertical short stems. This plant was staged by Mr Brian Russ. In the class for rock plants in fruit, Mr and Mrs Chambers showed another ericaceous shrub, *Gaultheria itoana*, with cheerful bronze-red foliage and fat white berries.

Conifers have to be chosen with care for the autumn show bench, as by this time of year the foliage of many is a dull dark green and their architectural merits are not sufficiently obvious on close viewing. Mr Roger Robinson showed *Pinus leucodermis* 'Schmidtii', which retains the light green colour of its new needles against the dark green of its previous season's growth, and this won him the J. L. Mowat Trophy. The runner-up was a pleasantly bronzed 20cm dome of *Chamaecyparis pisifera* 'Plumosa Compressa' shown by Margaret and Henry Taylor, whose selected form of *Dianthus alpinus* in another class captivated by its large flowers with intricately pencilled eyes.

In an excellent class for cushion plants were two plants of great difficulty. The 22cm dome of *Androsace delavayi* showed by Mrs Carole McCutcheon must be the largest immaculate cushion of this plant yet exhibited. Fellow-growers fervently hope that she will be able to master the difficulty they all experience in bringing the dormant buds through to their pale cream, marzipan-scented glory in the spring. A small flatter cushion of *Asyneuma pulvinatum* was staged by Mr Alan Spenceley. The blue-green spiky leaves have a delightful silver sheen when the plant, as here, is in full health, but we know that many hours of anxious care may not guarantee that covering of dainty pale blue stars which this elegant plant can offer us in spring.

D. F. M.

Kashmir – an ambition achieved

CHRISTINE WALKDEN

FOR many years I have wanted to go to the Himalayas to see the snow-capped mountains and beautiful plants in their homeland, but the restrictions on movement often inflicted by organised tours left me cold, so during 1986 I decided I would organise my own trip.

A decision on where I should go was taken after consulting several people who had been to Kashmir before and the floras of the area, 'Flowers of the Himalaya' by Oleg Polunin and Adam Stainton (1984), 'Wild Flowers of Kashmir' by B. O. Coventry (1930) and 'Beautiful Flowers of Kashmir' by Ethelbert Blatter (1927). Finally a 24-day itinerary was drawn up to enable me to see lots of plants, the Taj Mahal and spend a few days on the houseboats of Dal Lake at Srinagar. This would provide the opportunity for me to obtain photographic material of Mogul gardens for use in my teaching.

I approached several friends with this idea and finally, after lots of correspondence and phone calls, eight keen people left England on 28 July 1987 for a trip which turned out to be marvellous.

Thai Airlines provided us with a pleasant flight direct from Heathrow to Delhi, then a flight from Delhi to Srinagar by Indian Airlines transformed our environment into scenes of mosques, narrow streets, fascinating bazaars, wonderful houses and houseboats of Srinagar. We had arrived in Kashmir.

The following morning we left Srinagar by three taxis for our three-hour drive through the lush vale of Kashmir to Pahalgam where we were to meet our 17 ponymen and all the equipment.

During the afternoon we walked up the lovely Lidder Valley through the woods of blue pine and Himalayan spruce, with the roar of an icy-blue meltwater river thundering alongside the rough road. The afternoon was warm, and with great expectations we all enjoyed the scenery and our first sightings of plants.

These included *Hypericum elodeoides*, *Indigofera heterantha*, *Pteracanthus urticifolius*, *Aguilegia pubiflora* and the very familiar *Sedum ewersii*. The sides of the valley were covered with what became a very common sight – *Sambucus wightiana*; this is a herbaceous perennial growing to about 1.5m high, supporting the typical *Sambucus* creamy-white flowers anything up to 10cm across. In places these flowers were followed by either white, orange or red berries, quite an attractive plant but one which looked as if

it might have pernicious qualities if introduced into gardens at home.

Our first walk was to take us to the mountain village of Aru (2,550m) to camp just above the village. This was a lonely spot with the mountains on each side of the camp being clothed with *Pinus wallichiana*, *Abies pindrow* and *Picea smithiana*. Forming large thickets was *Viburnum grandiflorum* giving the impression of green lushness.

We awoke the following morning to sunshine and set off on the eight-mile trek through impressive forests to the camp site at Lidderwatt (3,000m). Among the woods and open valley floor were *Sibbaldia cuneata*, pink *Anemone obtusiloba*, *Potentilla eriocarpa* and *Gypsophila cerastioides*, an attractive low-growing perennial with spreading stems with small obovate leaves; the plant has small white flowers which are streaked with purple. This plant would make a nice addition to a rock garden and is worth looking out for. *Geranium wallichianum* was everywhere and often contrasted well with the white flowers of the Himalayan love-apple *Podophyllum hexandrum* (*P. emodi*).

This is just one of the medicinally important plants of the Himalayas as it contains podophyllin, thought to be useful in the treatment of cancer.

At the base of the rocky screes was *Arisaema jacquemontii*, which was very common in the valley. Higher up the screes near rocky streams were very nice colour forms of *Iris hookerana* from quite pale blue through to almost deep claret. *Primula rosea*, *P. denticulata* and *P. involucrata*, plus two other unidentified species, enjoyed the dampness, as did the Himalayan marsh marigold, *Caltha palustris* var. *himalensis*. Other plants included *Veronica anagallis-aquatica*, *V. beccabunga* and *Myosotis*.

Fantastic large thistles, *Cirsium falconeri*, grew everywhere; the whole plant is covered with whitish spines which give it a very architectural feel. Other subjects which I recorded along this walk included *Androsace rotundiflora*, *Oxytropis lapponica*, *Orobanche alba*, *Epilobium* sp., *Geum roylei*, *Gentiana carinata*, *Datura stramonium*, *Bergenia ciliata*, *Thymus linearis*, *Oxalis corniculata* and *Rabdosia rugosa*.

Throughout the valley live the local tribesmen, the Gujars, who live in huts made from stone, wood and mud. These are simple, flat-roofed huts with mud floors, being separated into different compartments for eating, sleeping and their cattle. The Gujar women often wore attractive silver breastplates and jewellery. Over the next two days we were making our way up towards the Kolohoi glacier and Mt. Kolohoi (5,400m) to botanise in this region.

If you only had a few days to spend in this region I would recommend this trek as it proved very rich indeed, revealing *Anemone tetrasepala*, *A. obtusiloba* both in its white and blue forms, that ever-popular plant which all trekkers to Kashmir like to find – *Meconopsis aculeata*, growing amongst

boulders, as was *Codonopsis ovata*. *Corydalis thyrsofolia* I was most taken with, growing in very damp places, producing yellow flowers borne in widely-branched inflorescences with many dense terminal clusters carried above glaucous foliage. I had never seen this before and was very impressed with it. *Potentilla atrosanguinea* produced deep, orange-red flowers with silvery foliage. *Primulas* appeared in gay abandon. *P. involu-crata*, *macrophylla*, *denticulata*, *irregularis*, *elliptica* and *rosea* gave us all much to talk about. *Pedicularis bicornuta* and *P. punctata* liked the dampness while the whole hillsides were covered with *Aconitum laeve* and *A. heterophyllum*, *Bergenia stracheyi* and the beautiful *Cortusa brotheri*. Rhododendrons appeared as we climbed, as did *Betula utilis* and *Salix spp.*

Not only did *Corydalis thyrsofolia* please me, but what pleasure we all experienced when we spotted *C. cashmeriana* with its deep blue flowers and attractive foliage. *C. rutifolia* was also in the valley.

Cassiope fastigiata grows among the damp slopes, but it wasn't looking at its best the time we were there. However, *Trillidium govanianum* fooled me into thinking it was a paris until closer inspection revealed the differences. *Fritillaria roylei* was first seen in bud then in full flower; the yellowish-green to brownish-purple flowers are chequered with dull purple, bell-shaped, pendulous and usually solitary. Like the podophyl-um, the bulbs of fritillaria are used medicinally.

During the afternoon we experienced our first spell of bad weather when we had a hailstorm and torrential rain. We all got very wet and extremely cold. However, after sheltering in a small hut we went on our way and mixed with some of the local inhabitants who asked for aspirins – a frequent request from the locals, along with money and pens.

On our return down the valley we saw *Picrorhiza kurrooa*, *Aquilegia nivalis*, a lovely plant which I would love to grow and see much more often, *A. fragrans*, *Geum elatum*, *Saxifraga sibirica*, *Rhodiola himalensis*, *Aster falconeri*, *Rhododendron anthopogon*, *Campanula modesta*, *Actaea spicata*, *Alchemilla trollii*, *Phlomis bracteosa*, the brilliant yellow and striking *Adonis chrysocyathus*, the green flowering *Euphorbia wallichii*, the blue small flowers of *Polemonium caeruleum ssp. himalayanum*, the bright blue flowers of *Lindelofia longiflora* and *Gaultheria trichophylla*.

The plan for the following few days was to camp in the rock bowl of Sekiwas which would mean walking through spruce and pine which gives way to silver birch and juniper. The area is supposed to be rich in edel-weiss, androsace and the blue poppy, but alas the sheep and goats had been through the area and nothing was seen, so we continued up the valley towards the beautiful Sonmus Lake at 4,500m. Parts of this walk reminded me of scenery in Scotland; the mountains became rolling, and as we climbed above the tree line the area became quite stark. Apart from

seeming like Scotland in places, the flora told us otherwise. New to my list were *Morina longiflora*, *Viola biflora*, *Scrophularia koelzii*, *Salvia hians* and *Nepeta coerulea*.

As you approach the lake surrounded by high mountains, the floor appears tinged with pink and yellow; millions of *Primula rosea* and *Ranunculus hirtellus* welcome the weary trekkers. This is a fantastic sight. The surrounding slopes provided homes for *Androsace mucronifolia*, *Corydalis cashmeriana*, *Aquilegia nivalis*, a purple *Viola* species, *Lagotis cashmeriana* and *Lactuca lessertiana*, a member of the lettuce family with blue flowers. *Gentianella moorcroftiana* grew along the rocks whilst *Androsace sempervivoides* and *A. sarmentosa* and *A. mucronifolia* kept our androsace enthusiast happy.

The next day proved to be the most spectacular of the whole trek in my opinion. It was to climb up to the Sonmus pass and then descend steeply to the camp site just beyond the shepherd settlement of Sonmus. In completing this walk, you pass through the various vegetation zones, from high alpine, scree meadows, forests and then into the valley. It took us ten hours to get down, but what a day. With spectacular views of the Zoji La peaks, you walk down and down and down, seeing good clumps of *Adonis chrysocyathus*, *Corydalis cashmeriana*, *Chorisporea sabulosa* in its white and pink forms, *Campanula latifolia*, *Dipsacus inermis*, *Leontopodium himalayanicum*, and *Leonurus cardiaca* whose seed is now of value in the treatment of heart disease. Primulas made their presence felt once again and *Primula minutissima* was found, only in one spot. Androsaces covered the hillsides. *Cortusa brotheri*, *Swertia petiolata*, *Meconopsis aculeata*, *Anaphalis triplinervis* var. *monocephala* and *Aster falconeri* provided distractions to the tiresome descent. *Potentilla curviseta*, forming low mats of leathery, hairy foliage with yellow flowers, clung to rock faces.

As we continued to descend and got into the meadows, *Trollius acaulis*, *Bupleurum longicaule*, *Peduncularis* spp., *Erigeron multiradiatus*, *Pseudomertensia moltkioides* and *Aquilegia fragrans* made our pass through meadows into woodlands interesting. Hundreds more plants were seen on the way down to camp and we all enjoyed the day. Our legs and knees knew what we had completed and we all felt tired.

From Sonmarg, having picked up six new ponies and fresh food, we made our way up to Thajiwas, the valley of glaciers, and set up camp. Most late afternoons saw a shower of rain, but by 5.00 pm the sky had blackened and thunder was booming up the valley. I sat alone in my tent writing up my notes when the heavens opened. I did not think much of it at first, but when the water started coming in the front of the tent I thought I had better do something about it. I started to bale the water out and tried to mop it up with toilet roll and my face-cloth, but this did nothing to stop

the 20cm of water coming into the tent within minutes, and we were paddling around in it quite quickly. Eventually we were all taken down into Sonamarg by a frantic taxi driver, hoping that his engine would get through all the water and washed-away banks, trees and roads. We arrived at the International Camp where we were given food and dry beds for the night.

The following morning was spent locally seeing similar flora to what we had seen previously and drying out our tents and belongings. Thajiwas is said to be rich in flowers, but the goats had been there before us so we moved on over the Sind river at the Shitkari bridge to walk up the Nichinai Nar (valley) to our camp site at 4,000m, situated on the south side of the Nichinai Bar (pass).

Once again we walked through zones of blue pine and birch scrub to reach high alpine flora. Throughout this walk on a fine day you can see a vast panorama of mountains from Thajiwas in Kashmir to Nun and Kun, in Ladakh. The whole valley was wet and supported vegetation of *Caltha palustris* var. *himalensis*, *Corydalis thyrsoiflora*, *Meconopsis*, *Parnassia cabulica*, *Pleurospermum candollei*, *Senecio chrysanthemoides*, *Gentiana*, *Primula*, *Pedicularis* and even more *Androsace*. During the afternoon the rain came down and we all returned to our tents for an early night.

I awoke the following morning in considerable pain with my back, and started off very slowly up the Nichinai Bar, hoping that the situation would improve. As the day progressed I got slower and slower, with few plants to encourage me as we were crossing huge snowfields, my situation wasn't getting better. Where the snow had melted were large patches of *Androsace mucronifolia*, and with it a white species which we failed to identify. *Corydalis crassissima* with succulent glaucous leaves and nice pink flowers was seen.

This side of the pass was much richer and I had more of interest to take my mind off the pain. I was now walking past *Oxygraphis polypetala*, *Rhodiola himalensis*, *Primula rosea*, *Geum elatum*, both yellow and white, *Anemone obtusiloba* and large sheets of *Androsace mucronifolia*. The others by this time were about halfway down when I saw them waving at me to hurry down. As I got closer I could hear them shouting at me. Could it be? Was I hearing right? My goodness, I was! They had found *Paraquilegia microphylla*. I ran down the snowfield and climbed up the cliff face as if nothing was or had been the matter with me. (Well, there wasn't now.) One of my main objectives of the trip was to see this plant, and I had it recorded only in one place and we were quite a distance from that point. This was great. I walked on with the others in another world and totally forgot my back problem for the rest of the trek.

The valley floor was completely yellow with *Anemone obtusiloba*. It is

interesting that this colour form only occurs at high altitudes while the other colour forms occur at much lower levels.

We walked across a river to get to our camp site at Vishanser. The lake is at 3,600m, while 500m higher is another lake, Krishansar. Both lakes nestle beneath the jagged volcanic peaks of Zogpu Dhar. Behind the lakes the view is dominated by an unnamed peak at 4,600m. This peak I was particularly interested in as the place near which I had a sighting of *paraquilegia*.

During the following day we all botanised round the lakes recording *Primula*, *Androsace*, *Senecio chrysanthemoides*, a *Lonicera*, probably *asperifolia* with cream flowers, *Iris hookerana*, *Phlomis bracteosa*, *Pseudomertensia moltkioides*, *Salvia hians*, *Pedicularis bicornuta*, *Aquilegia fragrans*, *Geum elatum*, *Podophyllum hexandrum*, *Gentiana carinata*, *G. cachemirica*, *Gentianella moorcroftiana*, *Ligularia amplexicaulis*, *Allium semenovii* and a Snowdon lily – *Lloydia serotina*.

While we were eating lunch I spoke to Andrew and decided that the two of us would go off up the Razbal Gali pass (4,166m) to see if we could find the recorded spot for the *paraquilegia*.

Our start was disrupted by Andrew nearly losing his socks in the outflow of the lake and me actually falling in. Neither of us was put off. Me dripping wet, and aware that time wasn't on our side, we walked very quickly on up the pass. Lower down the pass didn't reveal any new plants to us, but halfway up we spotted patches of white nodding flowers which quite excited us. Was this the *paraquilegia*? No, when we got near we saw it was that very beautiful anemone, *A. rupicola*, in profusion. The hillside was white with it. This anemone has solitary large, showy, white flowers, sometimes pinkish on the outside, growing around 20cm tall. It must look superb when the globular white, woolly seedheads form.

As we gained height the ground got stonier and at the top of the pass were sheets of *Androsace mucronifolia*, also the unidentified white flowering species, and there it was – large clumps of *paraquilegia* looking much better than we had seen it lower down. *Potentilla curviseta* was also there among the rocks.

On the way down, the clouds engulfed us with rain, and by the time we got back into camp we couldn't see the pass we had just enjoyed so much. The rain and very cold weather continued with us the next day when we had to return over the Ninchinai pass across the snowfields. It was bitterly cold and extremely miserable.

Once we got back on to grass we started to see *Dracocephalum nutans*, *Allium carolinianum*, *Adonis chrysocyanthus*, *Saxifraga andersonii*, *Lathyrus pratensis*, *Oxygraphis polypetala*, *Potentilla atrosanguinea* and a white flowering species of *Pedicularis*.

We returned down to Sonamarg, passing the plants we had seen on the

way up, and committed these to memory for we had completed our trek and were leaving the beautiful flora of Kashmir behind.

From Sonamarg we returned by road down the Sind valley back to the vale of Kashmir and Dal Lake to spend two days on the houseboats. This enabled us to get cleaned up, do our shopping, have a Shikara trip around the lake, seeing floating vegetable gardens and the sacred water-lily – Lotus *Nelumbium speciosum*, visit the Mogul gardens of Shalimar and Nishat and awake at 4.30 am to be taken by Shikara down the lake to see the floating vegetable market where all the local growers take their produce and exchange it from boat to boat at 5.30 am. This is a marvellous experience. Small boats are stacked high with French beans, kolh rabi, tomatoes, cucumbers, onions, etc. They collect together in the middle of the lake and exchange goods.

We spent the last day of our trip by taking an early morning (4.30 am again!!) flight down to Agra to see the Taj Mahal and Red Fort. For me this completed a marvellous trip. I had never organised a trip like this before. It was hard work, all the anticipation, sometimes worry, were all rewarded by sharing my pleasure with seven friends who I now know enjoyed it as much as I did.

Book Review

The Genus Cyclamen by Christopher Grey-Wilson,

illustrations by Mary Grierson and Judith Gauden

Published by The Royal Botanic Gardens, Kew,

in association with Christopher Helm and Timber Press.

Price £13.95 (UK), post & packing £1.35, pp.147.

Special price to members of SRGC, AGS and the Cyclamen Society until 15 August 1988: £10.95 (post free).

In his introduction, Christopher Grey-Wilson says that no one can produce the definitive work on Cyclamen, but he has come fairly close to doing so in this book. I am not competent to say if there are more erudite botanical treatises on the genus but as a volume for the informed gardener, for nurserymen and for horticultural scientists there can be no finer work.

The author has avoided too much botanical terminology but naturally there has to be a certain amount in order to deal properly with the many species listed. The text is always readable and understandable for gardeners but some of the keys require a degree of botanical knowledge. Are all rock gardeners competent to differentiate between "broadly triangular calyx lobes with an abrupt cuspidate apex" as opposed to "narrowly triangular lobes, subulate with a long acuminate apex"?

Nevertheless this is a book for gardeners to refer to constantly whether as an aid to growing or to identification. The bulk of the book deals in detail with the 19 species recognised by the author but there are important opening chapters on the structure of cyclamen plants and flowers as well as on growing. The general information on growing, seed-raising and pest-control is excellent. I wonder, however, who would be prepared to chop up their precious cyclamen corms like potato tubers as advocated for certain species in order to propagate them vegetatively.

The water-colour drawings by Mary Grierson are meticulous and beautiful. Almost all the species are depicted by her and provide an ideal means of identification. For those readers who want more botanical detail, the text drawings by Judith Gauden are full of detail which enables different forms within species to be identified.

The book is most attractively produced and is a worthy companion to Christopher Grey-Wilson's other books. For a book which will be the standard gardening work on Cyclamen for years to come it is splendid value at the full price of £13.95 let alone the special price of £10.95 to members.

J.M.

Seed Exchange and Distribution

JEAN WYLLIE (Seed Exchange Manager)

FIRST, I would like to thank all the Stirling and Angus Group members who helped me through my first seed exchange and distribution which, at times, to say the least, was rather harrowing, but, I am pleased to say, we all managed to keep our sense of humour. Thanks are also extended to the many members, both here at home, and abroad, who sent in their seed – without donors a Seed Exchange and Distribution would not be possible.

I would now like to remind members of the various dates and requirements in order to help make the next exchange and distribution a lot easier.

Donation of seed

Please send *clean* seed (i.e. seeds only, with no accompanying rubbish, pulp etc.) before 31 October. For any late ripening seed to be sent after this date, please send a list of them, also by 31 October. Under no circumstances is it possible to accept any other seed after this date.

Please write your name and the name of the plant *very legibly* on each packet of seed.

It is most helpful if all seed of a given type is put into a *single* packet, and not distributed between a number of packets. Also, it is very helpful if the size of the packet is appropriate to the size and amount of seed. For example, very full small packets, or a few seeds in a very large packet are time-consuming to process. Please use paper envelopes – polythene envelopes are not suitable.

Some members send their seed packets in bundles, alphabetically arranged, and this really helps us. Also, a complete list of your contribution of seed would be appreciated.

If you are sending seed which you think is unusual or new to the Seed Exchange, a short note about its origins etc. would be very helpful.

Some members in the southern hemisphere send their seed in January or February when we are very busy sending out orders – so please delay sending them until at least March.

If you suspect that your seed has not reached me as you have not received an acknowledgment card within a reasonable time, please contact me.

Seed Lists

Home donors – automatically receive a list. If they wish it to be sent

by first class mail please send a SAE (4½"×8"), and not just a stamp.

Home non-donors – must send a stamped addressed envelope to receive a list. The closing date for this is 31 October.

Overseas members – As from this year overseas members will pay for their seed with their subscriptions, and will be sent a seed list as usual. But they are only eligible to take part in the seed exchange if they have paid their subscription by 31 December. PLEASE SEND YOUR SUBSCRIPTION TO THE SUBSCRIPTION SECRETARY, MISS KIRSTEEN GIBB, AND NOT TO ME. Life members will pay separately for seed as in the past.

Arrangements for members from East European countries will continue as previously; please contact me for details.

Please contact me if you are due a seed list, but have not received one by the end of the first week in January.

Illustrations

Anyone who has colour transparencies which might illustrate an article are asked to contact Dr M. J. B. Almond, the Illustrations Manager, at 28 River Crescent, Ninewells, Dundee DD2 1UT.

Discussion Weekend

September 1988

University of Stirling, Conference Centre, Stirling
Friday 2 to Sunday 4 September 1988

The choice of Stirling for this year's Discussion Weekend gives members a chance to see Britain's most beautiful University campus and to attend a unique evening reception at Stirling Castle. Centrally situated between Edinburgh and Glasgow and well served by the motorway network, Stirling is easily accessible from all parts of the country. Stirling lies at the edge of the Highlands and is a good centre from which to visit the Glasgow Garden Festival, Loch Lomond, Ben Lomond, the Trossachs and the Perthshire Glens. Members arriving early may like to visit Stirling Castle, the Wallace Monument, Bannockburn (NTS) or Castle Campbell (NTS). There are good walks in the extensive University Grounds and in the Ochil Hills just behind the University. Stirling town centre has excellent shops and reasonably good car parking. Late night shopping is Thursday. The MacRobert Arts Centre is on the campus. A list of local hotels and tourist attractions will be sent on request (S.A.E. please).

Stirling University is situated on the A9 between Stirling and Bridge of Allan. Accommodation is available in Andrew Stewart Hall until Monday morning, 5 September. There are a few double rooms available. Members needing accommodation on the ground floor should request this at the time of booking. All lectures and the Autumn Show will be held in the Pathfoot building. There is a regular bus service from Stirling rail station to the University.

As usual there will be a club plant stall and a plant auction. Donations of plants for these will be much appreciated. We are also hoping to have a large entry for the Holiday Photographic Competition (details in Show Schedules) and for the Autumn Plant Show. If these are both well supported it will increase everyone's enjoyment of the weekend.

Programme

Friday 2

8 pm **The Life and Legacy of Reginald Farrer**
Mr James T. Aitken, Edinburgh

Saturday 3

10 am **SRGC—Question Time: a Panel of Experts**
Please come prepared with questions.

11 am **Conducted walk in the University of Stirling's magnificent campus** (weather permitting)

2.30 pm *The William C. Buchanan Memorial Lecture*
The Cultivation of Ericaceae and Peat Garden Plants in The Emerald Isle

Mr Harold MacBride, Lisburn, Co. Antrim

4.15 pm **People and Plants**

Mr Michael Upward, Woking, Surrey

7.00 pm **Reception at Stirling Castle**

Sunday 4

9.45 am *The Harold Esslemont Lecture*

The Lilies in their Fields

Dr Jack G. Elliott, Ashford, Kent

11.30 am **Wild Flowers of the Falkland Islands**

Mr Patrick Roper, Staffordshire

2.30 pm **Photographing Alpine Plants**

Mr James Sutherland, Ardfearn Nursery, Inverness.

An informal programme will be arranged for members staying till Monday morning.

Residents

A. Friday evening meal-Monday breakfast £80.50

B. Friday evening meal-Sunday afternoon tea £70.50

C. Saturday morning coffee-Sunday afternoon tea £54.50

The above prices all include the cost of the Reception at Stirling Castle.

Non-Residents

D. Saturday or Sunday morning coffee-lunch-afternoon tea,
and all lectures on that day £16.50

E. Saturday Reception at Stirling Castle £12.00

Applications for bookings together with the appropriate remittance should be sent to the Registration Secretary, Mrs A. Leven, 2 Leighton Court, Dunblane, Perthshire FK15 0ED. Tel. Dunblane (0786 824064).

Members wanting further information should write to Anne at the above address.

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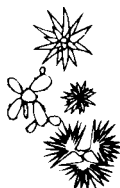
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