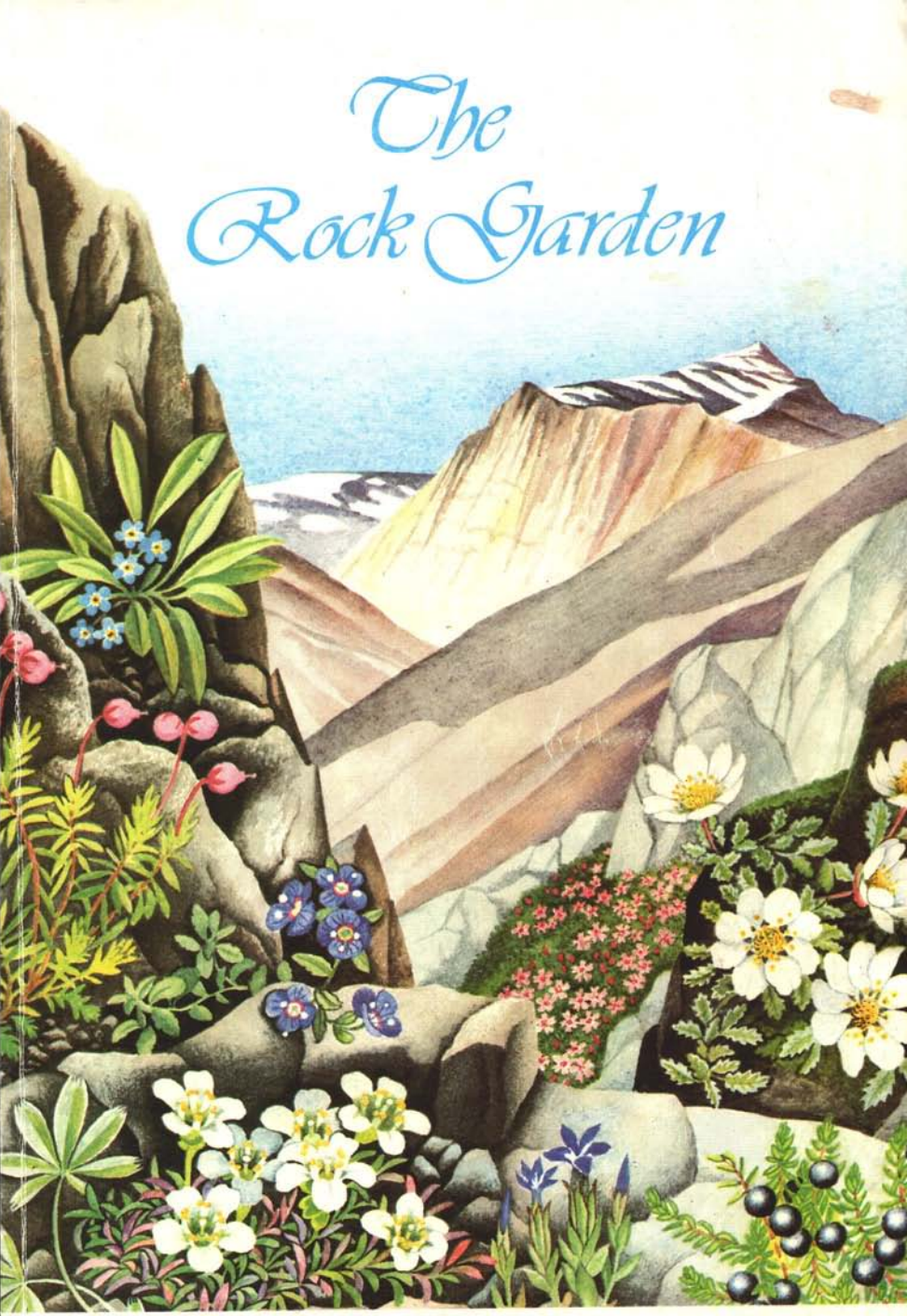
The Rock Garden



THE JOURNAL OF THE SCOTTISH ROCK GARDEN CLUB

Volume XVIII Part 3 Number 72

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The Rock Garden

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Volume XVIII Part 3 Number 72

June 1983

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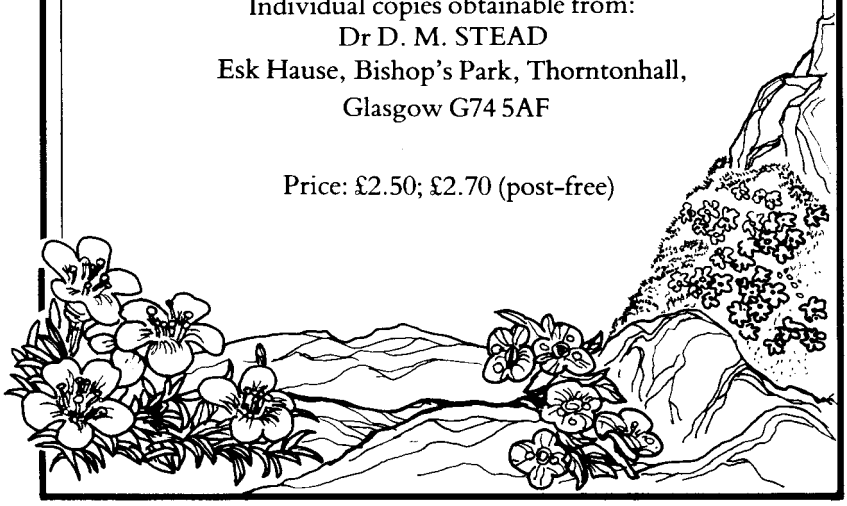


Cover paintings of Scottish alpine plants by Lawrence Greenwood

Contents

Editorial

WELCOME to the first issue of *The Rock Garden*.

The Journal of the Scottish Rock Garden Club has had a long and distinguished existence since it first appeared. Beginning as a forty-page annual publication in 1937, four years after the Club's inception, it managed only one more appearance before the 1939-45 war. It re-appeared in 1946 and has continued non-stop since then. It became a bi-annual publication in 1951 and has been issued in this way ever since. It has had a succession of distinguished editors who have given, between them, many years of hard work to the production of the Journal. These editors have been:

Kenneth Corsar	1937 - 1950
John Mowat	1951 - 1967
Alfred Evans	1968 - 1969
Peter Kilpatrick	1970 - 1976
Bob Mitchell	1977 - 1982

In 1983 the Club is celebrating its 50th Jubilee, a new editor has been appointed and a new printer is producing the Journal, so that this seemed an appropriate time to look forward. The next fifty years will bring many changes, not least among rock gardens and rock gardeners. Hence the new title and the new style. The print size has been increased to make it easier to read but with no reduction in the number of words per page. The front cover has retained the magnificent painting by Lawrence Greenwood which was on the January 1983 issue. In future issues the front cover will be a coloured photograph of a rock plant featured inside.

The numbering of the volumes has not been changed, so that for index purposes *The Rock Garden* will run on from the old Journal. It would have been nice to have discarded the roman numerals for the volumes, since many people do not readily understand the system, but, again for indexing, this would have raised too many problems.

A cumulative *Index for Journals VII to XVII* (January 1982) is being prepared at present and will be on sale to members later this year. This will greatly facilitate the finding of references to plants, authors and places. The willing and unpaid assistance of many members of the Club in doing the Index is gratefully acknowledged. To illustrate the size of

the job, it took one member around forty hours of work to assemble the cumulative index cards for the letter 'P' alone.

Expert growers may feel there is too much in this issue more suited to beginners than to them, but in a Club such as ours there is a need to interest beginners and bring them into active membership where they themselves can become experts. This need was brought home to me recently when I heard of a newly-joined member who could not get away on a much-needed holiday in January because the alpine seeds on the kitchen window needed so much watering. I think we have an educational job to do here as well as to interest our existing experts.

While travel articles are interesting, there have perhaps been too many in recent Journals and it is planned to reduce their frequency. Show Reports will be reduced fairly drastically as they are only of limited interest. It is hoped to have many more notes on the cultivation of individual plants. To this end, 'Plant Portraits', accompanied by a black and white photograph if at all possible, will always be welcome.

A beginning is being made on the building up of a library of black and white prints, by commissioning them at the shows or through events like the special Jubilee competition mentioned in this issue. Offers of unrequired black and white prints will always be accepted.

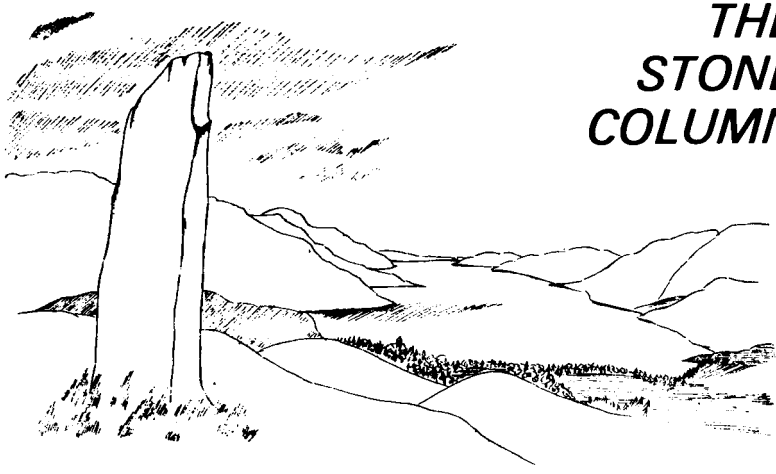
It would be nice to include more coloured photographs in *The Rock Garden*, but the high cost prevents this. Donations towards a coloured page will always be welcome.

I hope to interest more of our members in writing something for *The Rock Garden*. Do not be afraid of not being a literary and grammatical expert; the Editorial Committee will help to edit contributions before publication. While a typed manuscript is preferable, we will accept legible handwritten material.

If you have a snippet of information, too small for an article, get in touch with Mike and Polly Stone who will include it in the 'Stone Column'.

I would like to express my thanks to the previous Editor, Bob Mitchell, both for the splendid way he edited the Journal since 1977 and for the untiring way he initiated me into the mysteries of the art of editorship.

ALASTAIR McKELVIE



THE STONE COLUMN

Simple frames for alpines

There is no doubt that the cold frame is the quintessential asset in any alpine garden where propagation is carried out. Even if one has neither the time nor the inclination to propagate, one is always receiving 'bits and pieces' from friends, and one of the best ways of re-establishing an alpine is to pot it up and place in the frame.

Therefore, at its crudest, an alpine frame is simply a convenient place to stand pots. It follows that its function is quite distinct from that of the 'ordinary' garden frame. The latter serves basically to lengthen the growing season, be it for vegetable plants or annual bedding material, in spring. It is hardly surprising, therefore, that there are a number of design differences between the cucumber frame in 'Mr Macgregor's garden' and those to be seen at, say, Inshriach. The lights on the first warm the soil in spring by the greenhouse effect, and protect from short duration night frost. In the second, they are transparent umbrellas preventing the pots from the water-logging in winter, when precipitation greatly exceeds evaporation and transpiration. The single glazing of plastic or glass has very little insulating effect against prolonged winter frost. Ventilation, and how this is achieved, is the key difference. Young lettuce plants may be satisfied with the small gap produced by sliding a traditional frame-light back a little, or propping it up on a little piece of wood, but alpines prefer rather more by the way of fresh air (Fig. 52).

Adequate ventilation is especially important during humid weather, including when it is actually raining, therefore propping is preferable to sliding. The prop should also secure the light against the wind. An excellent arrangement is to be seen at the Royal Botanic Gardens, Edinburgh; glass lights of traditional wooden construction are hinged at the centre of a double-sided frame and held open by stout steel struts,

hooking into eyes mounted on the lights (Fig. 53). Ideal though they may be, such a set of frames is beyond our means financially to purchase, and beyond our DIY skills to reproduce. We had to think of a cheaper, simpler design.

The first decision to be made is whether to use glass. Glass has excellent light transmission characteristics and is stable under sunlight. On the other hand glass is heavy and fragile. There is a period in spring, and to a lesser extent in autumn, when the lights over alpines are best removed in the daytime and replaced at night. With only a few lights, or if two people are available, this presents no great task; but if the number of frame bays increases to 20-30 then it becomes onerous indeed. In our case, with one gardener out earning a living, the other is left the chores (garden chores of course, housework and cooking have a much lower priority) and has to handle the lights solo. Picking up a glass light at one end tends to twist it and so break the glass. The structure must be rigid enough to prevent this happening, thus compounding the weight problem. We decided, therefore, to use plastic sheeting on our home-made frames. The material chosen is flexible polythene sheeting, reinforced within a 1 cm square mesh of nylon filament rather like fishing-line.

The oft-mentioned drawback of plastic is that it degrades under the action of the ultra-violet component of sunlight, becomes brittle and disintegrates. Some of our lights are now five years old and so far show no signs of wear. Since the sheeting is simply stapled to rectangles constructed of 5cm×2.5cm (2×1 inch) timber, it will be quite easy to replace the plastic when the time comes. We used ordinary galvanised fencing staples and a hammer, but a stapling gun would be ideal if available. Probably one reason for extending the life of our own lights is the fact that we store them in the loft for the period from mid-May until the end of September while the ultra-violet is at its strongest (we do not cover any plants during the growing season after the spring frost danger is over). A bulb-house is in the plans – maybe one day – and is intended to be of glass!

It is absolutely essential to secure a lightweight plastic light firmly at both ends to prevent it blowing off in strong winds; and we often get gales through the Great Glen. It is possible, but very time-consuming, to tie them on. It is better to spend time to save time by constructing a fastening system which is simple and quick to use. We have no experience of the use of rigid corrugated plastic sheeting, but have seen it used successfully. There is even an expensive double-glazed version.

If anyone is considering building their own frame we would thoroughly recommend they use 'bricks and mortar' for the basic structure rather than timber. Once built, they will last a lifetime, and laying bricks is not really difficult if you do it slowly. A piece of string keeps the courses

straight and a spirit level 'checks' verticals. Our frames are not entirely straight or vertical, but the plants don't notice!

Our first set of frames consists of three runs, each 18 ft by 4 ft 6 ins wide (about 6×1.5 m), each divided into six bays covered by single-sided lights (Fig. 54). If we were starting again now, we would put two double-sided wider runs into the same area. They would make more economical use of the space, with one path less. Also although 90% of our precipitation comes with a south-west wind 'up' the Glen, there are occasions when there is a north-east wind 'down' the Glen, blowing rain or snow onto the open side. A later frame, built chiefly for seed-pots, is closer to the RBG arrangement (Fig. 55). Whichever of the lights is on the lee side can be opened wide, with a small gap on the windward side for through ventilation. A second feature copied from RBG is the raising of the frame above ground (three courses of concrete building blocks instead of one). Although this involved a great deal of extra effort, six Land Rover loads of infill were used – we think it worthwhile for the convenience of seed-pans closer to eye level. Once it's done, it's done!

As we have often said, experience in one part of the country does not necessarily apply in others; winter humidity here in Fort Augustus is rather high so we are more preoccupied than most with ventilation. There is no such thing as too much ventilation for an alpine here, except for the rare occasion of frost plus east or north wind. However, before considering any frame arrangement for alpines we would recommend the following points:

1. Can the lights be completely and easily removed? Few alpines prefer to be under cover in the summer.
2. Can the air circulate throughout the frame without the rain driving in?
3. Can the light be conveniently secured against gales, while still allowing for this ventilation?

Some of the commercial designs intended for general gardening do not adequately fulfil all these requirements.

Mollie's mobile garden

The traditional advice often offered to an alpine gardener thinking of moving house is simply – "Don't". Moving a garden is infinitely more time-consuming and nerve-racking than moving the furniture. However, we have to admit that, on occasion, other factors can outweigh purely horticultural considerations.

So it was with one of our longest-serving members, Mollie Harbord, who had to transfer her singular plant collection from Pitlochry to St Andrews during the autumn of 1981. When one has been in alpine gardening for a long time, many of one's plants come to have personal associations over and above their intrinsic ornamental merit. For-

tuitously, many of her most prized plants are contained in a number of troughs described as a 'Mobile Garden' in her own article in the Journal (number 64, p.231). One point, not mentioned therein, is that (luckily for us, as it turned out) the troughs are not large. Complete with compost and plants, none weighs much more than a hundredweight (50 kg) and so can be easily picked up. They were, in fact, deliberately made to be transportable thus.

We first met Mrs Harbord at the 1974 SRGC 'Discussion Weekend' in Edinburgh – to be precise, alongside the peat wall at the Royal Botanic Gardens. Later she arranged for us to visit the late Major General Murray-Lyon's garden in Pitlochry, shortly before he died. To use an American expression – "We owed her one" – for that experience, and for the many plants which came our way in due course; and so when we discovered her impending move we offered to transport the troughs in our Land Rover.

Although a high vehicle, it does not have an extensive floor area by van standards, so we arranged strong boards across the back to provide a second tier of storage. Several layers of old carpet and underlay were used to cushion the floor – for reasons which must be painfully obvious to those who have used this type of transport. Although this made it more difficult to slide the troughs in, we felt some buffer was necessary between the metal floor and the fragile hyper-tufa. Thick wedges of screwed-up newspaper were placed low-down between the troughs to prevent them from coming into contact with each other, and to protect any plants hanging down the walls.

At the St Andrews end, the only access to the garden lay down a passageway and through the house. This problem had been anticipated and Mollie had arranged for the loan of an old-fashioned 'hand-barrow'. This comprised of a wooden platform as wide as a man (sorry person), fitted with two carrying handles at each end.

Two trips were necessary to move around thirty troughs, and a third would have been required but for friends who responded to a one-word telephone call – "Help!". Their arrangement of tiers of plastic trays, normally used for transporting show plants, took the bulk of the pots.

There were two slight mishaps only. The hyper-tufa coating on a small glazed sink had attached itself to the brick supports underneath. In attempting to free it a section flaked away from one end. A second trough, one of the oldest and largest, had suffered so much frost erosion that it started to disintegrate when we tried lifting it and was therefore left behind.

Genuine stone troughs and sinks tend to be large, very heavy objects even when empty. For any grower whose profession causes inevitable moves around the country, a collection of purpose-made hyper-tufa troughs of such a size as to be easily transportable, makes an aesthetically

acceptable alpine collection. So much more attractive than growing everything in pots.

Incidentally, when passing through Guardbridge in Fife, en route for St Andrews, there was much hilarity in our little convoy as we spotted a large pantechnicon parked at the side of the road marked clearly in large letters – 'Alpine Removals'.

***Aciphylla hookeri* – a striking example of dimorphism**

Aciphyllas are an acquired taste. When showing visitors round the garden we come early to a low raised bed containing a number of the medium sized *Aciphylla* species. If one of these is indicated, particularly to the non-alpine grower, their expression occasionally says – "What on earth are they growing that thing for?". We are quite unrepentant – Aciphyllas have a strong visual personality and justify their modest space requirements. They make their presence felt in more ways than one, as anyone who has come into contact with needle-sharp spines on the tips of their leaves will testify. On our paving a group of three *Aciphylla horrida*, their rigid leaves varying subtly in shades of bronzy-green, all yellow-edged, contrasts beautifully with a slightly larger (75 cm or 30 in) tall specimen of *Aciphylla glaucescens* with its thinner more flexible blue-green armament.

Aciphyllas serve the same function in the winter landscape as do dwarf conifers. One criticism levelled at Aciphyllas is that many species are very similar. So they are, but so are many dwarf conifers, dozens of cultivars of *Picea abies* for example or even drabas. Common to all three groups, however, is the inclusion of certain distinctive plants well deserving elevation above the general run. One such is *Aciphylla hookeri*, perhaps our favourite of the medium species; we prefer it even to the slightly better known *Aciphylla pinnatifida*.

We were sent seed in December 1978 and this waited for the second spring before germinating in April 1980. Growth was rapid and they were pricked out into three-inch pots of non-limy scree mixture in June 1980. Around this time we were raising over half-a-dozen Aciphylla species and as there appeared nothing distinctive about their narrow foliage, we took most of the young plants to 'Alpines '81', only planting out two ourselves, and keeping one pot in reserve. Shortly after the conference itself, we were visited by Jim Le Comte, a New Zealand nurseryman who has made a special study of the genus. When shown the specimen of *Aciphylla hookeri* planted in the raised bed mentioned previously, he considered it was correct, but added that it bore only the juvenile foliage. The adult leaves are quite different and he proceeded to sketch one on the proverbial 'back of an envelope'. Later, when the morning's tour finally reached the frame area, confirmation was surprisingly forth-coming. The pot plant had just started to produce a dramatically distinct

adult leaf. The adult has striking colours of olive green on the back, lovat green on the upper surface, with a central bright orange streak towards the tip of each pinnule. Also the primary pinnae stand up at an angle from the plane of the axis, giving the whole leaf a three-dimensional 'squarrose' appearance.

We understand from Jim that the species can flower in its juvenile form, and was described as a separate species – *Aciphylla townsonii* in H. H. Allan's *Flora of New Zealand*. This is hardly surprising – our living young plants gave no hint of change to come, let alone a dried specimen.

During the past severe winter, the plant in a trough died – perhaps it resented having its tap-root frozen for weeks. The other two survived and the pot specimen has now joined the other in a raised bed. The chances of them being male and female, and flowering together are rather remote; so, as for propagation, we are stuck. Fortunately, *Aciphylla hookeri* is not a rare species in the wild and, unlike Celmisias, *Aciphylla* seed from the exchange does usually germinate. An acquired taste perhaps, but try some.

Dicentra peregrina seed

It has become the conventional wisdom in this country that seed of this gorgeous little alpine *Dicentra* has to be sown absolutely fresh – one grower even advocating taking the ready-filled seed-pan to the plant. It was while cleaning the last batch of seed collected from our own plants that it occurred to us that our observations and experience do not entirely agree. Many of our original plants were raised from Japanese seed obtained third-hand, which must have been off the plant several weeks. Sown September, it germinated very well in April after one winter in a cold frame. They were not pricked out but given a very dilute liquid feed about once a fortnight. The next spring, when one year old, they were tipped out just as growth was commencing and carefully separated. As it is a plant of juvenile gravelly soil, chiefly on volcanoes, no loam was used but a soil-less mixture of roughly equal parts of peat, leaf mould, coarse sand and chippings. They have increased in size as well, and have been repotted each subsequent spring into a plastic pot of one inch (we do not think of our pots in metric sizes) greater diameter.

However, they have done better in a trough, preferably a deep one, containing the same compost and completely unprotected from the weather at all times. Here they have formed a small mound of finely-divided glaucous foliage about 15 cm (6 in) across by 10 cm (4 in) high. The lobes are about 1 mm wide, of a thick, almost succulent texture, with blunt apices. The scapes rise well clear of the foliage and carry a raceme of up to nine pink flowers. These are of the normal 'locket' shape of the genus, having four petals, two of which reflex and two form a projecting tube. July-August is given as the flowering period in the wild, but in our

own experience, commences at the end of May and continues until early August. Seed ripens very quickly after the flowers fade but, if left to their own devices, the shiny black seeds remain in the withering capsules for quite some time in the dry state before shedding. Maturing piecemeal over such a long period, it is not practicable to sow absolutely fresh. We compromise by collecting up for a 3-4 week period then sowing. Inevitably, one or two seeds are dropped and in spring (1982) two self-sown seedlings appeared on one of the troughs. Consequently, we have deliberately sown some seed straight onto troughs during August 1982.

There is an interesting short article on the cultivation of *Dicentra peregina* in Vol. 3 of the Japanese Alpine Garden Society Bulletin. In it, Kochi Onoe states that he found this species in bad condition when visiting alpine gardens outwith Japan. As are many people who adopt a country, we are pro-Scottish chauvinists, and so we cannot let this comment go unchallenged. We have seen this 'Japanese gem flower', as he calls it, growing well in a number of Scottish gardens. The main problem seems to be obtaining a plant in the first place. We have hesitated to send seed to the SRGC Exchange, because of the long-term viability problem. We should be interested to hear from any member who has germinated, stored and spring-sown seed.

Dr Onoe also mentions a red form, which we have not seen; and a white one which, strangely, is more vigorous here than the type. It has slightly paler foliage like many albinos, but the difference is only noticeable if placed beside the normal pink form.

The proposed Tasmanian dam

In past months, considerable attention has been paid by the UK media to the proposal to build a hydro-electric dam in a so-called 'world heritage area' of western Tasmania. It is well known how journalists can distort the truth – by careful selection of facts, exaggeration or quoting out of context – in the interests of a 'good story' and their own careers. Consequently, we asked a correspondent in Tasmania for his opinion:

> "I consider myself as a person very concerned with conservation. However, we do need this dam and it won't affect our flora seriously at all. The main opponents are young people who use the river for rafting down. It is beautiful, like all wild areas, but there are many more rivers there. The flooding of Lake Peddon several years ago for hydro electricity, opened up a wonderful area for bush walking, and easy access for such places as Mt Ann and the Western Arthur that people just could not get to before, because of their remoteness."

It seems that our fears were justified and in concentrating on the activities of a certain media botanist, our press and television have not presented a balanced view of this development.

As in many things, it is a question of compromise. We would not wish

to advocate a chairlift on every mountain, but reasonable access roads and car parks to assist entry into an area for those willing to use their feet, are to be welcomed. We do not belong to the 'leave it alone at all costs brigade' in conservation, any more than in plant collecting. How does it benefit mankind if a beautiful alpine plant flowers unseen on a remote mountaintop? What good is a 'world heritage area' if access is virtually restricted to those – such as television journalists – who can afford a helicopter?

Development will always upset someone. Summer visitors to the Scottish Highlands often express distaste at our hydro-electric dams and power lines. They forget that those of us who actually live and work in the Highlands depend on these structures for our mains electricity supply. Who is to say we should be deprived of the benefits of electricity for 365 days in the year simply so that tourists can view unspoiled scenery everywhere for a few days?

Before deciding where you stand on this matter, we would humbly draw your attention to the following facts. Even with this new dam there will still be many untouched rivers in western Tasmania, as there are in the western Highlands of Scotland. The valley is steep-sided and only a very small area will be inundated. Hydro-electricity is a renewable resource and is totally non-polluting.

What are the alternatives? Nuclear power? A coal-fired station to increase the output of sulphur dioxide? We have all become aware of the dangers of acid rain, which in the long run may well cause far more damage to the vegetation of Tasmania over a wide area, not just in one small part of a valley bottom.

If the dam is built and the surrounding peaks explored on foot by enterprising plantsmen, who knows what new treasures may be introduced. At present, we have just germinated *Clematis marmoraria*, an exciting dwarf species recently discovered in a remote part of the South Island of New Zealand – so the precedent is there.

Pyrola seed

We recently received a letter from a member living in Leeds, who wished to know whether we had any success in germinating seed of *Pyrola*, *Chimaphylla* or *Shortia*. He had apparently tried these from the Exchange many times without result. We only have personal experience of raising *Shortia* from seed and here the species do vary in their response to storage. *SS. soldanelloides* and *uniflora* germinate well when sown fresh in autumn and also if spring sown, say via the Exchange. However, the American *S. galacifolia* produces a high germination rate from our own autumn sown seed. We have had less than 10% from incoming spring sowings. Thus it appears to remain viable for a rather shorter time than the two Japanese species.

On the other hand, we have never succeeded in germinating any *Pyrola*, *Moneses* or *Chimaphylla*, our own fresh seed or otherwise. Neither have we heard of anyone who has succeeded in doing so, but would be pleased to hear from any member who can report a germination. We should all be delighted to know how it was achieved!

It has been known for many years that Pyrolaceae, like Ericaceae, have a mycorrhizal association on their roots. This is a fungus that grows in and on the roots, assisting in the efficient absorption of nutrients from the soil. It has been suggested that the presence of this fungus is necessary for initiation of germination. However, seeds of at least some Ericaceous plants carry the mycorrhiza on their coats, thus ensuring its presence in the growth medium of the seedling. L. D. Hills in *The Propagation of Alpines*, states that Pyrolas manage their seeds best without assistance. A great many plants do self-sow here, but not Pyrola so far. We have a feeling that it is the stability of the natural woodland environment that is necessary for the development of Pyrola seedlings. These conditions are difficult to reproduce in glasshouse or frame, where temperatures and moisture content fluctuate quite widely.

In general, the adult plants are hearty growers, even rampant, providing they like the situation provided. A patch of the pink flowered American *P. asarifolia* is now over three metres across, extending its white spaghetti-like runners up to one metre per year. Having happily smothered *Hacquetia epipactis*, *Clintonia uniflora*, and *Heloniopsis orientalis*, it has had to be severely restrained. We were accused by friends of making very exotic compost. "Don't you know it's sought after", they said; but how does one coil a yard of spaghetti into a give-away container? Only *Galax aphylla* successfully runs with it, being that bit taller.

One from the postbag

"Rarely mentioned perks from exhibiting at club shows, are the pieces of rare plants that old hands like to give to a newcomer to boost his enthusiasm. Rock gardeners are remarkably generous in distributing rarities. Perhaps at the back of the mind there is the thought that a piece may return if the stock plant dies, but the main driving force is the desire to see a good plant multiplying and establishing in cultivation.

But, potential exhibitor, beware, a mention in our Journal's 'Show Report' can have the minor drawback of inducing begging letters. One widely respected gentleman (very generous to folk he knows) deals with these letters as follows. If a stamped, addressed envelope is enclosed he writes a polite refusal, but if there is no stamp the begging letter goes straight into the fire. He already has a list of friends with desirable homes for his rare propagations and these friends naturally come first in the queue. One hint, if you are solely tempted by mention of a rarity, the offer

of some unique swaps may just preserve your letter from the bonfire; reciprocity is the name of the game if you are not a personal acquaintance.

Of course, on the other hand, Journal publicity can have an unexpectedly desirable effect. I once described a failure in print and, unasked, the lost plant materialised out of the blue – well, actually, the letter-box – from a generous reader. Our good rock gardeners tend to be keen propagators and the extra plants need a home. It's nice to be in a position to say, 'I can give'."

***Sagina boydii* – a Scottish native?**

Walking round the show at the SRGC 'Discussion Weekend' last September, with Don Stead, we paused at the class for Scottish Native Alpines. "I don't see how that can be a native", he said, indicating a dark green cushion of *Sagina boydii*. "Why?" I responded. "Well, we don't find it at all hardy in our garden (Thorntonhall, south of Glasgow), even in a well drained position." The history of this plant in our own garden bears out Don's experience. In a pot in a cold frame, *Sagina boydii* will survive a normal winter, but not a severe one like 1978-79 or 1981-82. Tried out on a trough, it was hopelessly damaged the first winter. Thinking it could be winter damp that was causing the trouble, we planted another in a trough with a winter cover. This treatment has succeeded with such diverse damp-sensitive but frost hardy plants as *Jankaea heldreichii*, *Primula allionii* and *Androsace helvetica*. And what happened? A freezing February wind scorched off the top three-quarters of the Sagina, while leaving all the true alpine cushions unharmed.

In fact, arguments as to whether it is frost or damp that *S. boydii* dislikes are irrelevant. One of Scotland's 'Munros' (Scottish mountains over 3,000 ft) is visible from our windows, and at any time during the winter, snow cover can and does disappear overnight with the onset of a warm front. Few Scottish alpines are guaranteed snow cover and must tolerate freezing winds, and prolonged wet, especially in autumn.

Flora Europaea hedges its bets by saying – "is presumed to have been collected near Braemar, Scotland, in 1878, but has not been seen since." The known facts are simply that it turned up in William Boyd's potting shed, either as part of his own Braemar collection, or in an incoming consignment of plants from Switzerland. Apparently, it does not set seed and has been maintained by vegetative propagation (division is simple) ever since.

If *Sagina boydii* is anything more than a genetic freak, from *S. procumbens* perhaps, then we suggest the best place to look for it near Braemar, the coldest part of Scotland, would be as a snow-patch plant. Try one of the semi-permanent snow-beds in the high corries of the Cairngorms; but we doubt you will have any luck. *Cassiope hypnoides* is in Scotland somewhere, we feel sure, but the *Sagina*?

Postscript on capillary buffering

(see Vol. XVIII, part 2, number 71, page 180)

During the last few days we have had another illustration of the efficacy of a sand 'standing' in moderating the water content of a plastic pot. Some rooted cuttings of dwarf Epacrids, sent by a friend, were soaked for a few hours to thoroughly rehydrate them. They were then potted up into 3 inch plastic pots in our usual two peat, one course sand compost, well watered to settle them in and set aside for an hour or two to drain. It has been a very cold spring here so far, with frost most nights. To avoid giving them a sudden shock after the 'warmth and comfort' of their postal journey, we didn't wish to put them straight out in our cold frame. Lacking a greenhouse, the potting shed serves – it has a large window. Simply standing the pots on the wooden bench is not satisfactory, even for a few days acclimatisation. The compost will remain far too wet for this critical period.

Consequently, a plastic seed-tray was filled with about 2.5 cm (1 inch) of dry sand and the six pots firmly stood thereon. Next morning the sand was completely and uniformly damp. All this moisture had been pulled down out of the pots, leaving them with a much better air/water ratio. (Fig. 56)

Geranium farreri

Paraquilegias from cuttings and seed

MARGARET and HENRY TAYLOR

IN SEPTEMBER 1981 during a visit to the garden of a prominent member of the AGS, we were shown some healthy-looking plants of *Paraquilegia grandiflora* that had been rooted from cuttings. This technique was news to us, so we dashed home to try propagating this rare and highly desirable plant.

First catch your Paraquilegia! Fortunately due to our Seed Exchange and a generous friend we had already raised several unflowered seedlings of both the blue and the recently introduced white Kashmir form. Now this first attempt was in September when the plant naturally dies back for the winter, but desperate to try out this new idea, we made cuttings using the short shoots with little clumps of leaves. The material was given the same treatment as all our other cuttings, that is hormone dipped and inserted into a peat and sand mixture in an enclosed polythene frame with a soil warming cable. Our neighbour, Fred Hunt, also gave this a trial.

To our surprise, the leaves on the cuttings remained green although those on the parent plants died down for winter. Eventually about November weak roots formed. Our little plants did not survive the severe conditions of January 1982 but Fred's did in his frost-free alpine house.

Intent on doing better next time, in April the following year, when growth was well underway, more cuttings of both blue and white forms were taken. This time they were inserted into peat and sand in clay pots which were plunged in damp sand in a plastic propagator and stood in the shade. By mid July (possibly earlier if we had not forgotten about them) we noted that each 'blue' cutting had grown a mass of strong roots and we were able to pot up a dozen healthy plants. Foiled again with the Kashmir form.

On a third trial, using bottom heat in July, we had rapid rooting of the 'blue' but the dwarf white seems difficult! To be honest, not one has rooted, but maybe next year. The original seed collector's notes state that our Kashmir form was collected by Hatch, Kline, and Starling around 14,400 feet, whereas our more amenable blue came from 11,500 feet in Bhutan as Ludlow and Sherriff number 16356.

Seed is rarely set on a solitary plant of Paraquilegia, so if you do not

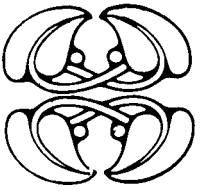
fancy chopping up your one-and-only, beg some pollen from a friend who should be glad of a swop. Quite a bit of seed was obtained this year from our newly flowering plants by hand pollination. Even our beautiful but non-rooting dwarf white from Kashmir consented to set seed. With our original seed we found that autumn sowing while fresh gave a germination the following spring but winter sowing of dried seed lay dormant all summer and only germinated during the following spring. Seedlings pricked off while very tiny grew vigorously and flowered two years after germinating whereas plants left in the seed pots remained tiny. We use a peat, grit and fertiliser mixture for our pots but other plants have flourished outdoors in troughs with only a glass cover as protection from the winter rain.

Have a go, try either cuttings or seed to get this 'top of the wants' more widely into cultivation.

Primula 'Fairy Rose'

Mr K. R. Wooster of Milton Keynes

I was interested in the mention of Primula x 'Beatrice Wooster' in the June 1982 Journal and wonder whether you are acquainted with the sister plant P. 'Fairy Rose' which is in my opinion a far choicer plant. Along with a number of others, some good and some not so good, these two hybrids were raised from the same cross in 1948. P. 'Fairy Rose' received an AM in 1951. It has very sharply-toothed leaves and carries the large round flowers on short scapes free of farina. The two cultivars are quite dissimilar, 'Fairy Rose' being slow to grow and does not become at all leggy in old age. I have kept a further two of these hybrids. Both are good but different; one is blue-purple in colour with minute scapes and virtually no leg. It is slower growing than most forms of *P. allionii*, the seed parent. P. 'Fairy Rose' has not been distributed as widely as 'Beatrice Wooster' which I attribute to the fact that it is too slow to be a 'trade plant'. With me these hybrids are all easier than *P. allionii*.



Crete and the Lammergaiers

CHRIS and MARIE NORTH

CRETE has a wealth of endemic plants, many large birds of prey, impressive scenery and evocative Minoan treasures. It is a large, long and narrow island (roughly 250×40 km) and to benefit from its attractions a hired car is almost an essential adjunct to a holiday there, though car hire is expensive – currently about twice the cost of that in Spain. Alternatives to self-drive would be to hire taxis, join a conducted tour or, if one has sufficient time and energy, to travel by bus.

Like most other Greek islands, Crete is hilly with three main mountain groups, two rising to over 2,000 m and one to 1,400 m; they are from west to east, the Lefka, Idi, Dikti and Sitias. Plant hunters will want to visit these regions and to do so it is advisable to station oneself somewhere in the north of the island for the main feeder road runs the length of the island in the north. Staying on the south coast would hamper one's travel and limit what could be seen in two or three weeks though a south coast road is planned. We were based at Herakleion (also called Iraklion, Iraklio and Candia) from 2nd to 14th of April. The four main archaeological sites are indicated by triangles of dots and are from west to east Festos, Gortys, Knossos and Malia. We climbed the Lefka and Dikti mountains but an attempt to get to Idi was foiled by rain and low cloud and there was no convenient second opportunity, though the weather was generally hot and sunny whilst we were there.

Before leaving Britain we read what literature could be found on the flora and amongst the articles on other peoples' visits that by Professor Davis (1937) was especially helpful, even though it was written some years ago. It deals mainly with the plants of the mountains. The major work we consulted at the Edinburgh Botanic Garden was that by Rechinger (1943) and the Wisley Handbook No. 9 (Huxley 1972) was an inexpensive and helpful introduction to the flora though its specific references to Crete are limited. A recent book on the flora of Greece by Huxley and Taylor (1977) illustrates many of the species quoted in this article.

One does not have to go to the mountains to see interesting plants, for many abound at low levels. The main road south from Herakleion takes one through hilly country to the fertile cultivated Messara plain at

Ag. Deki and then to the south coast near Timbaki, passing the archaeological sites of Gortys and Festos (Phaistos). On this route and others in the area as, for example, those to Archanes, the ruins of Knossos, and the village of Kastelli, we saw many plants. Those particularly showy and plentiful included the beautiful white form of *Ranunculus asiaticus* (occasionally the flowers were pink), *Chrysanthemum coronarium* which is the plant most obvious to those tourists who have little knowledge of plants, *Tragopogon porrifolius* – the salsify with large mauve flowers that close at noon, *Gladiolus communis* and *Gynandriris sisyrinchium*. The last of these looks very like the iris depicted on the friezes of the Minoan palace of Knossos some 3,000 years ago. In the vineyards that produce good, strong, red wine one sees much Bermuda buttercup, *Oxalis pes-caprae* (syn. *Oxalis cernua*), a beautiful but troublesome weed from South Africa. It opens its flowers in the morning and shuts them at noon like salsify but the reverse to *Gynandriris*. Orchids were abundant, including:

Anacamptis pyramidalis
Ophrys cretica
Ophrys fusca
Ophrys lutea
Orchis italica
Orchis papilionacea
Serapias vomeracea

We also saw *Ophrys tenthredinifera* though it did not seem to be common, and *Orchis saccata* sometimes called *Orchis collina* – a rather uncommon species with a short broad spur and practically entire lip often of a dull brown iron-oxide colour though some of the plants had green-edged or entirely green lips. *Ophrys cretica* which should, perhaps, more correctly be called *Ophrys kotschyi* ssp. *cretica*, is an endemic with rather tall inflorescences of well-spaced bee orchid-like flowers having dark lips with pronounced lighter markings. Other plants we noted were:

Anchusa azurea
Allium sp.
Arum italicum
Cerinthe major
Convolvulus altheoides
Glaucium flavum
Lathyrus aphaca
Lloydia graeca
Muscari comosum
Phlomis cretica
Phlomis fruticosa
Tetragonolobus purpureus
Thymelaea hirsuta
Urginea maritima
Vicia hybrida

Some less widespread species were; *Ophrys bombyliflora, Narcissus tazetta* with developing seed capsules near Archanes and much *Arum dioscoridis* close to Kasteli. We thought the *Arum* was *Arum creticum* at

first for we had seen that species in flower amongst the ruins at Knossos so we collected some tubers at Kasteli. It was not until they flowered in the garden that the identity was obvious and perhaps we may be forgiven the mistake as Rechinger (1943) does not seem to mention *Arum dioscoridis* in his treatise on the Cretan flora. Two other aroids were the tiny *Asarum vulgare* and the huge *Dracunculus vulgaris* growing in the shade of a carob – *Ceratonia siliqua* orchard. The *Dracunculus* was the variety *creticus* which has well marked stems and leaves. A form with a completely white spathe has been reported from Kamares, a village 10 km north-north-east of Timbaki, but we were unable to find it.

At Pombia the flowering trees included, in addition to the deliciously scented oranges and lemons, *Acacia cyanophylla* and *Melia azedarach* neither of which are true natives but are naturalised in some parts of Crete. Other showy flowering trees or bushes were the native Judas tree – *Cercis siliquastrum* and *Styrax officinalis,* the last usually growing in stream beds.

Quite a few butterflies were on the wing including the large pale form of the scarce swallowtail *Iphiclides podilarius feisthamelii,* southern comma, red admiral, eastern festoon, dappled white, clouded yellow and the cleopatra – *Gonepteryx cleopatra* which is an attractive insect like our brimstone but usually with brilliant orange-red forewings. Though we did no special bird watching we saw a Bonelli's eagle, ravens, the Cretan form of the hooded crow and many crested larks.

A few kilometres to the west of Herakleion there is a marshy area near the shore, or at least there was one for it is fast being filled as a rubbish dump and we were amused that the nearby village is called Skafidaras. In wet ground here grew the beautiful *Orchis laxiflora* in large numbers and it had clearly been picked over; the flowers are sold in bucketsful at Herakleion market. This area is also a good place for bird watching, in spite of the stench of burning rubbish, for there were flocks of glossy ibis, squacco herons and an occasional osprey.

On a trip eastwards from Herakleion we skirted the coastline, made a detour over terrible roads by a small village Skinias to the seaside resort of Elounta and then to the tourist town of Agios Nikolaos. Near the shore, a few kilometres out of Herakleion, there were carpets of colourful plants including:

Adonis annua
Anagallis arvensis
Anthemis cretica
Cochlearia sp.
Echium diffusum
Eruca sativa
Evax pygmaea
Gladiolus communis
Glaucium flavum
Lloydia graeca
Matthiola sinuata
Medicago marina
Papaver rhoeas
Silene colorata
Trifolium stellatum
Xanthium spinosum

On the beach, in pure sand, grew rounded bushes of the grey-leaved *Otanthus maritimus*. Near the shore at Elounta we saw the white trumpets of the thorn apple *Datura metel* and the vicious Roman nettle – *Urtica pilulifera* with its ball-like inflorescences. Growing amongst rocks away from the shore were other plants we had not noted on the previous sorties, including:

Asphodeline liburnica
Asphodelus microcarpus
Aristolochia sp.
Bryonia cretica
Ceterach officinarum
Clematis cirrhosa
Prasium majus
Smilax aspera

There were quite a few plants of *Ranunculus asiaticus* here and some of them had flowers of a clear lemon-yellow colour instead of the usual white form of Crete. We saw one specimen of the man orchid, *Aceras anthropophorum* which does not seem to be common on the island, a few *Ophrys cornuta* and several plants of a large flowered *Ophrys fuciflora maxima*.

Near Elounta we were invited to look round a working windmill grinding grain with the aid of canvas sails and wooden machinery and to see hand-loom carpet making. We ate our packed lunch near here looking over the sea to the island of Spinalonga which was once a leper colony and watching two elegant white egrets fishing in the shallow water.

One of the highlights of our time in Crete was a trip to the top of Spathi (2,148 m) the highest summit of the Dikti mountains. We went via the Lassiti plateau, which we had already visited twice earlier in our holiday, stayed the night at the village of Psichro and climbed to the top with a guide the next day. Leaving Herakleion we drove along the main coast road eastwards and turned off south just before Hernissou to climb to the Lassiti via Avdou and Moni Kardiotisus. The Lassiti is a flat fertile agricultural region where crops, especially potatoes, are grown. It has an elaborate irrigation system planned by the Venetians and with hundreds of canvas-sail windmills for water pumping though most of them have been superseded by more modern machinery. From the plateau there were superb views of the snow-clad mountains and we often saw large raptors, especially griffon vultures and golden eagles, sometimes as many as five in the air at one time. Occasionally we had a distant view of the magnificent lammergaier or bearded vulture identified by its relatively narrow wings and wedge-shaped tail – but more of him later! There were small birds as well and we especially noted a nearly white form of the black-eared wheatear, *Oenanthe hispanica*.

In the surrounding scrub by Lassiti and around the cave Dicteon Andron, where Zeus is said to have been born, there are many interesting plants amongst the prickly garrigue, dominated by an *Erinacea* and *Quercus coccifera,* including:

Arabis verna	*Ornithogalum* sp.
Arum creticum	*Ruscus aculeatus*
Anemone hortensis stellata	*Polygala venulosa*
Cyclamen creticum	*Verbascum spinosum*
Cynoglossum creticum	*Hermodactylus tuberosus*
Daphne sericea	*Iris cretica*

The *Daphne* (sometimes called *Daphne collina*) usually had dirty pink flowers which fade to brown as they age but some plants produced clear pink flowers and all had a rich scent. Orchids here included *Orchis quadripunctata, Orchis provincialis* ssp. *pauciflora, Serapias vomeracea* and a few plants of *Barlia longibracteata, Ophrys fusca iricolor* and *Orchis tridentata.*

Our guide Petros Zervakis had arranged a 'hotel' for us at Psichro which turned out to be a clean, stark, white-washed room in an outhouse with the minimum of bedroom equipment. There was a flush lavatory down the path and an old lady sat knitting to be ready to pull the chain after use; apparently the cistern was an idiosyncratic veteran which could not be entrusted to visitors. It took us seven hours of fairly leisurely walking to get to the top of Spathi and back to Psichro and we stopped at the small isolated church of Ag. Pneuma to eat our lunch. Here Petros announced that he intended to take a siesta but we were anxious to get on and decided to continue without him but shortly he joined us again. During the night the sirocco had been blowing from North Africa and it was still rather warm and hazy. Soon after Ag. Pneuma we came across scree where a very sweetly-scented violet grew. There were large clumps of *Iris cretica* covered with beautifully veined flowers. It grows in other parts of Greece but the flowers are rarely so well marked as those on Crete. This species is sometimes classed as *Iris unguicularis* ssp. *cretensis* but it is dwarfer than the type and retains this character in cultivation though it is not very hardy and is apt to succumb to Scottish winters. Plants lower down, near Psichro, had broader falls and looked more like the typical *Iris unguicularis.* Amongst the iris grew a tiny *Myosotis*-like plant with blue or white flowers and cushions of the small, spiny *Cichorium spinosum.* There was also a yellow *Romulea bulbocodium* and a small white *Romulea,* possibly a *Romulea columnae* form. As we approached the snow we could see that it had been sullied by orange-brown dust brought over from the Sahara by the

sirocco. On the edge of the melting snow grew *Chionodoxa cretica* with blue and *Chionodoxa nana* with white flowers and we wondered whether these two species really are distinct for there seemed to be many intermediates. Here they were at any rate in their proper setting for *Chionodoxa* means 'glory of the snow'. Sharing this habitat was the magnificent *Crocus sieberi versicolor* with large, rounded, white flowers darkly stained and pencilled on the outside; some especially attractive specimens had pure white flowers. This Cretan endemic is not often seen in gardens, probably because it does not survive hard winters in Britain. Amongst the scree near the summit was the small *Draba cretica, Cichorium spinosum, Berberis cretica, Daphne oleoides* not yet in flower and *Arum creticum* which, high up in the mountains, is usually dwarfer and with paler flowers than the lowland form though it also was not yet in flower. There were orchids with flower buds appearing but we were unable to identify them with certainty but we think they were probably *Orchis provincialis ssp. pauciflora.* For part of the way up we had been shadowed by a man leading two mules and we avoided him for, in our experience, it is better to use Shanks's pony rather than suffer the discomfort of a Greek wooden saddle. At the summit of Spathi, Petros embraced us as though we were the first visitors to reach the top. The view from the summit was poor on account of the haze but our disappointment was mitigated by two golden eagles circling at close quarters.

The other two-day excursion we made was to the Lefka mountains in the west. Leaving Herakleion we had to take the road to Tilisos then turn off west to Perama and join the new road to Rethimnon, for the coastal road from Herakleion was not completed when we were there. Climbing out of the town one passes through rugged country where every large bush seemed to have its own singing nightingale. There was much *Cistus salvifolius* and *Cistus villosus* ssp. *creticus* which has flowers that are more pink and less mauve than the type. With them was the rather short-growing and small-flowered *Nerium oleander kotschyi* – an oleander endemic to Crete. Some *Spartium junceum* bushes were in flower and there were large patches of the blue *Lupinus micranthus (Lupinus hirsutus), Cynoglossum creticum, Lavandula stoechas* and *Cyclamen creticum* in moister places. About Marathos grew large number of *Orchis quadripunctata* some of which were small and odd-looking and we wondered, in retrospect, whether they were *Orchis boryi* – an enigmatic species confined to Crete. Further on were stands of bracken, *Arbutus andrachne* and *Erica arborea,* suggesting that the soil was acid there. We drove on past Rethimnon to Chania and then took the road south to Fournes, Meskia and the Omalos plain which is higher than the Lassiti and consequently colder. There was little evidence of recent cultivation

and the ground was covered with acres of wild mauve *Anemone coronaria* punctuated here and there with a few scarlet specimens and the pink flowers of *Tulipa saxatilis*. There were probably as many tulips as anemones but they were only just coming into flower. It seemed that this might be the area where the bulbs were dug for sale as food in the Cretan markets. Other plants around Omalos included *Ranunculus ficarioides* which is a large-flowered celandine growing in moist places, *Hermodactylis tuberosus, Gagea peduncularis, Berberis cretica,* and *Verbascum spinosum*. In an aged fruit tree by a ruined building we saw a butterfly which we think was the large tortoise-shell *Nymphalis polychlorus*, and it seemed to just have come out of hibernation though this species is not reported from Crete by Higgins and Riley (1970). Near here we also saw and heard chukars – a noisy and colourful kind of partridge.

We made our way up to the 'hotel' by the car park at the end of the road and booked a room for the night. Before turning in we climbed to the snow line where there were magnificent views of the surrounding peaks. Here grew an *Erysimum* with yellow flowers, probably *Erysimum raulinii*, and *Aubrieta deltoidea* which seemed a little odd in its true alpine setting after knowing it from the heaps of stones which pass for rock gardens in suburbia. There were more *Chionodoxa* and *Crocus sieberi versicolor* and *Onosma erecta* – a fine species which rapidly took over a trough at home and then died. While on the mountains we had the honour to be dived at by a lammergaier which evidently had a nest in the neighbourhood. It passed us within five metres but we were so taken aback that we never got a photograph and hope all of you will not think this a fisherman's tale. It is a beautiful bird with the wingspan of a condor and having the appearance more of an eagle than a typical vulture. Its head and neck are not bald like that of the griffon but clothed in golden feathers. Although it is rated as very rare in Europe it has a wide distribution and we understand that this aristocrat is not above scavenging on rubbish dumps in parts of Africa.

Throughout the night we were so cold because of the dampness of the bedclothes that we feared to sleep least we should freeze to death and were glad when it became light. At breakfast we sat on the concrete balcony drinking coffee and warming our bones in the sun, overlooking a ravine to the peak of Valakias. The lammergaier swept in and gave a 'floor show' gliding backwards and forwards by the balcony. This was the highlight of our visit – lammergaier for breakfast! In spite of its impressive size it was mobbed by puny, screaming choughs; it ignored them.

After breakfast we made our way down to the Samaria gorge which leads for 18 km to the south coast at Roumeli. Here were rugged

specimens of *Cupressus sempervirens* looking like the age-old larches of the Alps. There were also wild plane trees – *Platanus orientalis* and *Pinus halepensis* under which grew masses of *Cyclamen creticum* in flower. *Paeonia clusii* and *Ranunculus flabellatus* – a charming species somewhat resembling a diminutive *Ranunculus bulbosus* with 'flat' yellow flowers. On rocks grew more *Onosma erecta* and curtains of *Ebenus creticus* not yet in flower but we searched in vain for *Anchusa caespitosa*. It was stiflingly hot in the gorge in spite of the cold night and thinking that we must be the only humans for miles we stripped and bathed naked in an inviting stream with rock pools. No sooner were we in the water than a noisy party of Germans appeared and we felt obliged to stay immersed up to our necks until the party had passed but we did not expect the water would be so cold! We did not go far down the gorge as we had to return to Herakleion that day and in any case there was probably too much water to be able to negotiate the gorge at its narrowest point. Back at Herakleion, looking round during the last few hours we saw the uncommon yellow-flowered henbane, *Hyoscyamus aureus* growing on the walls of the Venetian Arsenal. A last minute drink of raki, which proved to be very strong, and we left for home.

Crete is the most fascinating part of the Mediterranean we have visited so far and we must go back again. Next time we may make our base in Chania or Rethimnon to explore further the wilder parts of the west but then, in the east there are the Sitias mountains with many good plants and the only wild colony of date palms in Europe near Paleokastro in the extreme east – an endemic Cretan form, of course. There is still the chance of discovering new species. In 1980 a quite distinct new dwarf buttercup with hairy leaves and calyx and yellow flowers *Ranunculus radinotrichus* (Greuter and Strid 1981) was recorded from the Lefka mountains for the first time. There is so much to see in Crete.

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Thirty years with perennials

LAWRENCE JOHNSON

I WENT to work for a large commercial nursery with a range of stock from perennials to large shade trees and evergreens, and spent two full years with the propagator, a man of many years experience, and then moved to our local sales department, and for a number of years divided my time as a propagator and gardener. A world's fair had been held in Chicago in 1934, and a large exhibition was staged there by my employers. Many of the items used at the fair were moved home, and those that survived are giants. A large garden was laid out, across the highway from our sales area, with flagstone walks, a lily pond and such amenities, and was planted with a wide variety of the stock we grew. When I first saw the place in 1946, the garden was a wilderness because of years of neglect from 1940 until 1945. After it was again habitable I spent my summers replanting the place, most of the time single handed. The terrain ranged by then through strong sunlight to deep shade, and with unlimited material at hand it became a show place of perennials and flowering shrubs. For a few years we planted some hundreds of rose bushes, but their care was too much of a job.

In the meantime I had joined the RHS, and later the SRGC, and took advantage of their seed exchanges. Various devoted persons brought me sods of native flowers and ferns. Lacking room at home to display all the plants I grew from seed, I transplanted them to the nursery garden, and over the years they were seen by many knowledgeable people. Once, when working nearby, I heard a lady shout, "I haven't seen this plant since I was in Kew Gardens!" As I remember, the flower was one of the rarer dodecatheons.

Before I started growing from seed I became fascinated with *Colchicum* and *Crocus,* neither of which I had ever seen. The first I had was *Colchicum* 'Lilac Wonder', one of two I bought in 1947. I gave one away and planted the other, and have sold and given away hundreds of bulbs since then, but my supply seems inexhaustible. A friend gave me a catalogue from the late Ralph Cusack, of Roundwood, County Wicklow, Eire, and I bought a collection of colchicums, including *Colchicum speciosum* 'Album Plenum'. They all did extremely well. Then I was moving to a new house and, with criminal ignorance, dug my bulbs before they were ripe and I lost that treasure. I have had a number of

Colchicum autumnale 'Album Plenum', but they finally disappeared, and I suppose I had the inferior form that Mr Bowles describes. I have *Colchicum autumnale* 'Flore Plenum', and Mr Bowles says of it that it blossoms so late in the year that cold weather destroys much of its beauty. That is as true here, in Indiana, as it was of southern England.

Concerning Ralph Cusack, with the bulbs came a card from him telling me he was moving to the south of France to live, because of ill health. We exchanged yearly letters until his death. I still have the letters, a mine of information about the flora of the region. He wrote a novel which was extolled here, and he was hailed as a successor to James Joyce.

My favourite plants from seed were the primulas. Not all grew for me, but I had *Primula beesiana, bulleyana, burmanica, florindae, involucrata, pulverulenta, denticulata, sikkimensis* and *wardii* and I must not forget *Primula sieboldii* and *japonica*. These all come from a milder climate than mine, and in most cases last no more than a few years, but they are very worth while to grow and they charmed visitors. Once I had a large planting on the north side of my house of *Primula pulverulenta* and they were under ice all winter, but made a wonderful display in the spring. I have 'A Quest for Flowers', the record of Ludlow and Sherriff's journeys in the Himalayas, and I like to know that I have grown at least two of the plants mentioned there, *Primula sikkimensis* and *Paeonia lutea* var. *ludlowii*. Once, an English lady resident here at the time, returned from a visit home and brought me a flourishing plant of *Primula denticulata*. I asked her how she got it through customs, and she said in her sponge bag!

I read a book concerning peony culture and was interested that the authors stated they supposed few gardeners would bother with the species peonies, and I wondered why not. They don't all grow for me, but I have *Paeonia daurica* by the dozen, the foliage handsome, the flowers ephemeral, and the seed pods are gorgeous. *Paeonia veitchii* grew and flowered once, but never again. *Paeonia delavayi* is iron hardy and flowers very early in the cold spring. I am told by the best professional grower of peonies I know that *Paeonia lutea* var. *ludlowii* will not bloom for me, but my plants are immense and I have hopes. However, he says mine may flower from seed. This is a far cry from rock gardening information, but a friend had an old plant of tree peony 'Souvenir de Maxime Cornu' and I asked if I could get a division. The plant was very old and my spade bounced from the root, as it might from contact with a truck tyre, but I obtained three fragments, with a leaf and root on each. One grew and in a few years I had a plant four feet across and as high. Lacking room in my home garden, I sold it.

I bought *Paeonia mlokosewitschii* which did very well, but I foolishly parted with my plants. I have grown them from seed, but inevitably the flower is that of *Paeonia daurica*. Concerning the remarkable name, about which Reginal Farrer has something to say, I understand it means 'the milkman's son'. This name is also given to a grouse which is native to the Caucasus.

I grew many varieties of hostas from seed, and I introduced them to the garden in my charge, and there, in the shade they ran rampant, particularly *Hosta ventricosa*, and I can easily gather a pound of clean seed from it. I toss seed into an adjacent wild ravine every year, and the hostas crowd out the nettles there. In my early years at the nursery we propagated large numbers of *Daphne cneorum* from cuttings stuck in sand, under mist. We could sell all we grew, but our stock seemed to run out of vigour. All knowledge of them locally seems to have vanished. I grew *Daphne tangutica* obtained from Saskatchewan. An attractive plant, it lasted only a few years. A fellow collector had a daphne he said grew four feet high and as much across, obtained in Oregon. I had a plant from him, and grew several more from cuttings, and found it was a splendid form, but too big for my garden, and I sold my stock to my employers. The Brooklyn Botanic Garden people identified it as *Daphne caucasica* and told us they did not have a specimen, and we were happy to supply one. We have it in quantity growing in a sandy field and it continues to be iron hardy.

I bought hardy cyclamen in my early days; they did well enough, but disappeared, with one exception. A corm of *Cyclamen europaeum* is certainly twenty years old and it grows and blooms amid a planting of *Pachysandra* in the shade of a huge birch tree. All I have ever done for it is to tear away the encroaching roots of the ground cover.

A friend brought me sods of *Dodecatheon meadia* from an area about to be flooded, and it seeds itself. Another friend brought all he could carry in a box of plants from his woodland containing six different kinds of plants, most notably nodding trillium, supposed not to be the most showy of that clan, but the faint touch of ivory in the newly opened flower is worth seeing.

Euphorbia myrsinites and *Euphorbia polychroma* were among plants we once grew commercially and they seed themselves and persist where I allow them to. I have the most enquiries about the former.

At the present time I consider the hellebores my favourites. We have stocked *Helleborus niger* all my years here and, until lately, imported them from Holland. They arrived by air in the fall, with their leaves trimmed off, and of course they had to be heeled in, and the mortality was high, due to the defoliation. Lately we found an American grower.

I had never seen a plant that lived up to its name of 'Christmas Rose' until last year. Ours flower from March to April. But now I have such a plant, the gift of a friend. I wonder if any of our Danish members recall the handsome Christmas annual, Juleroser, published in Denmark every Christmas, when I was young? Not that I have ever been in Denmark, but I was intimate with a family who received this treasure from their relatives in Denmark every year. The pictorial cover always carried a representation of the plant about which I am writing. I suppose publication ceased some time prior to 1940 for well-remembered reasons.

I have been growing hellebores for my own satisfaction for probably ten years. They are utterly faithful. Seed planted in the spring won't germinate until the next spring, so it is necessary they be labelled securely. When the seedlings are large enough I transfer them to small pots in a frame, and when they develop a few leaves I transfer them to open ground, and I don't lose any. I have *Helleborus cyclophyllus, Helleborus lividus, Helleborus corsicus,* (syn. *Helleborus argutifolius*) and *Helleborus* x *sternii* flourishing exceedingly in the good soil of my garden at home, dying down in winter, but springing to life when sun and warmth prevail again. The first plant of *Helleborus foetidus* I grew was planted in the garden at the nursery where it could be seen, and I escorted a visitor to view the plant. It had been there in the morning, but in the afternoon it was not. I had only two visitors prior to that time and one was that very rare person who knew what hellebores are!

Dwarf irises belong to real enthusiasts and we had such a person in our village who hybridised them and produced many delightful miniature plants. The village was, at one time, the home of an international dwarf iris society and, at blooming time, for a number of seasons enthusiasts converged on the place for a weekend session, where papers were read, flowers inspected, and they came from many states and European countries. Shortly before the owner gave up the place and his life work, because of advanced age, my chief and I were given the run of the garden and we transferred many treasures to a plot in the nursery.

I have always been an admirer of lilies, but have never had much luck growing them from seed. I can remember *Lilium formosanum* which delighted me for several summers and then disappeared. Years ago we had stocked *Lilium davidii* and it still thrives in my own and other gardens here. Out of a collection of lily bulbs I obtained from a dealer only one – 'Mrs R. O. Backhouse' – has survived. I believe this is a *Lilium martagon* derivative and, if so, is the only one of that group I have ever been able to keep.

I got *Mertensia virginica* and it seeded and spread, but it is succumbing to crowding, mostly from ferns. The chief of the entomology department of the State described a scene in southern Indiana as "a mile of *Mertensia*", and what a glorious prospect!

I have had cypripediums several times. They seem to thrive and then disappear, and I will buy no more, nor will I accept the well meant offers of plants. I had *Epigaea repens,* apparently doing well, and it gave up the ghost.

We grew *Pulsatilla vulgaris* from seed in the nursery one year, and listed it, and later transferred the plants to the open fields, and in that soil they became enormous, and we dug the plants and divided them, a day's job, as I remember, and few took hold and survived. I grow it at home and had for years a plant with flowers of almost an ivory colour. I am delighted when a self-sown seedling turns up. I never know what the colour will be.

I admired a splendid photograph of *Smilacina racemosa* in an old copy of the RHS Journal, and enjoyed seeing that hardy, familiar native plant in such a setting. The books at hand don't list a larger form, but I once saw a huge clump of them in bloom along a rural road much taller and more floriferous than any I know. Several varieties of *Polygonatum* grow here. I see the largest is described as capable of a height of eight feet, but I have never seen such giants. A friend brought me a root of a variegated variety she said had come from the Orient, and I have it in many places, both sun and shade, and it must be widely distributed locally, for I have given many away. Lately I met the man who had brought the root here, smuggled from Japan!

My collection of trilliums is very showy and includes *Trillium grandiflorum, cernuum, sessile* and *luteum*. The first three are native to the locality, the last is from the south. It is a large plant with mottled leaves and the yellow flowers don't open. I had a stranger from the west coast, also with mottled leaves and showy red flowers. A friend has mastered the art of propagating the double trillium, that is, notching the base of the bulb and replanting and setting out the bulblets that form from the scars, and this is the source of the few doubles I have, more curious than beautiful, I think, with a greenish cast. I have seen a photograph of a double of dazzling white. A lady I know in Winsconsin who has acres of trilliums on her farm walked out to view them, and sat to rest at the base of a tree, and noticed beside her a fully double *Trillium grandiflorum* and, without thinking, she plucked the flower! And she was unable to locate the plant and felt very foolish indeed. I sent her one of mine last fall.

I have *Sanguinaria canadensis* in great quantities, all from a few plants taken from the wild years ago. They and *Hepatica triloba* populated a

Fig. 46 *Mertensia maritima*
Fig. 47 *Silene acaulis*
Fig. 48 *Anagallis tenella*
Fig. 49 *Vaccinium vitis-idaea*
Fig. 50 *Gagea lutea*
Fig. 51 *Rubus chamaemorus*

Mertensia maritima

Silene acaulis

Anagallis tenella

Vaccinium vitis-idaea

Gagea lutea

Rubus chamaemorus

Photographs—J. Aitken

steep bank, in shade, and in what was a pastured woodland, and under a barbed wire fence. There have been no cattle there for twenty-five years, and I wonder if these plants can repopulate the area, strong enough to compete with six-foot nettles and giant ragweed. I have had the double form of 'Bloodroot' and have lost it because I was prone to give too many divisions away. I cannot believe it is particularly rare. I know of a Dutch wholesale nursery where it may be purchased by the hundreds at no great cost.

I bought a collection of tulip species from the firm of Constable of Tunbridge Wells, and they did well. Nowadays they can be had in quantity from any good bulb dealer here. I attempted to move some, without really knowing where to dig, to my present home, and I got *Tulipa praestans* which I still have, and I quote Ralph Cusack: "nothing could conceivably exceed them, so savagely blazing in March and April that the eye can scarcely bear the furnaces of their flowers under the bright sun". These words read like something from the *English Rock Garden,* but I didn't find them there, so I will give my friend the credit!

Jubilee Photographic Competition

Although coloured illustrations have more visual appeal than Black & White the cost of the former rules them out as anything other than an occasional treat. Although not many people still take Black & White there is no doubt that a good print can convey as much as a full colour print.

In order to build up a library of Black & White prints for *The Rock Garden* the Aberdeenshire Group is running a Jubilee Competition with a first prize of £25. The Rules will be as follows:

1. The subject is any plant suitable for rock, wild or water garden. Plants may be in cultivation or in the wild.
2. Each entry shall consist of three Black & White prints, each print to be of a separate subject.
3. The maximum size of a print shall be 10″×8″.
4. Only two entries per person allowed.
5. The closing date shall be 31 May 1984.
6. Judges shall be appointed by the Aberdeenshire Group.
7. Entries, which will remain the property of the Club, should be sent to the Editor, *The Rock Garden*.

Scotland's native treasures

RON McBEATH

SOME thirteen to fifteen thousand years ago the glaciers which had completely covered Scotland for very many centuries rapidly started to melt. This retreating ice exposed a barren, desolate countryside covered with glacial drift and debris, which was very soon to be clothed by a succession of plants, led by an advancing tide of Arctic alpines.

For a long time those plants had been confined by the ice to southern England and the adjacent European mainland, but with the improving climate vast new areas were opened up for colonisation by the plants adapted with the best methods of seed dispersal and ability to grow under poor soil conditions, whilst able to withstand the harsh climate. As the weather steadily improved, the alpines were ousted from the lowlands by a succession of more vigorous herbaceous plants, trees and shrubs. Gradually over the years the high Arctic-alpines have retreated upwards to their present position on or near the mountain tops, or at lower altitudes on exposed sea cliffs.

In comparison with the mountainous countries of Europe the number of species found in Scotland is quite small. This is due to a number of factors. Some species now common in the Alps may not have been in the best position for the colonisation of Britain when the improvement in the climate started, others may have been unable to migrate north to the Highlands fast enough and were overtaken by more vigorous plants, whereas other species probably did not find our mountains high enough, or the present climate cold enough and the open habitats they demanded were invaded by more vigorous species which eventually excluded them.

By far the richest mountains for plants in Scotland lie in a band from Ben Lui in the west through the Breadalbanes in Perthshire to the Clova glens in Angus. On many of those mountains there are base-rich schists and limestone outcrops, giving rise to rich brown soil and wet flushed areas, where underground water rich in nutrients can come to the surface. Most important of all are the numerous rock outcrops and cliffs which provide a safe haven out of reach of all but the most determined sheep, deer, gardeners and botanists, who have combined in the past to devastate many of our less common and showy plants. Although the

above- mentioned hills hold our richest flora, almost every big mountain or large island in Scotland has its plants of particular interest. Often they are exceedingly rare plants, confined to a local rock type, whereas others seem to grow only on one or two mountains for no obvious reason.

One of the great joys when plant hunting in the Scottish hills is the opportunity which still exists for the discovery of new species to Scotland, or finding extensions to the known range of some rare species, even though plant hunters have been at work searching the hills for over 300 years.

Perhaps the saxifrages are our most showy mountain plants; four species are common widespread plants whereas five species are very rare. The season starts in April with the purple saxifrage, *Saxifraga oppositifolia*, a species common on moist basic rocks and flushed areas. It is widespread in Scotland, occurring from the Border hills to the Shetland Islands. In Perthshire it is seldom below 1500 ft, yet in Sutherland it comes down to sea level on exposed cliffs. The large, rich rosy purple flowers are freely produced in early spring. When not in flower it is easily identified by the low spreading habit of dark prostrate stems clothed in opposite pairs, of very small blue-green leaves. The yellow mountain saxifrage, *Saxifraga aizoides* is even more widespread in the Highlands but is absent from the Borders and Shetland. Its favourite habitat is rock outcrops covered with a trickle of water; it will often descend to the roadside where it clothes rock cuttings in June and July with an abundance of yellow flowers.

The other two common species have white flowers but are very distinct in appearance. *Saxifraga hypnoides* is a 'mossy' species, with a low spreading habit and finely cut leaves. The large white flowers are held upright on thin flexible stems, two to four inches high. It is widespread in the Highlands and the Border hills where it prefers wet grassy flushes or damp ledges. *Saxifraga stellaris* on the other hand, forms compact small clumps; each plant is made up of several rosettes of leaves from which arise the stiff upright flower stems, one to three inches high, each bearing small white flowers with reflexed sepals. This species is not particular to soil type, therefore it is the most widespread saxifrage we have. Its favourite habitat is amongst moss in wet flushes, stream sides, or where there is little competition from other plants in high, cold damp corries, which hold snow late into the year.

Much less common is *Saxifraga nivalis*, a plant confined to near the top of the higher hills, where it is found almost exclusively on rock outcrops. This species resembles *Saxifraga stellaris* in its flower spike and the formation of a rosette of leaves, but it can easily be distinguished

by the reddish purple underside to the leaves and the flower sepals which are held upright.

The other four species of mountain saxifrage are exceedingly rare Arctic relics, probably at the southern range of their distribution in Europe. *Saxifraga rivularis* is confined to a few mossy patches in high north facing corries where the snow lies late in the season. It grows half to one inch high with small white flowers. Even rarer is *Saxifraga cernua*, the drooping saxifrage which is confined to only three high summits where it grows on basic rock ledges. The small white flowers are seldom produced in Scotland, therefore since little seed can be set to perpetuate its existence, it must rely on the little red viviparous bulbils produced on the sterile flower stems. *Saxifraga caespitosa* also has a preference for basic rocks near mountain summits where it forms small cushions of mossy leaves. It is distinguished from *Saxifraga hypnoides* by its compact habit, the cushions seldom exceeding six inches across, also the much shorter flower stem bearing smaller white flowers. With a preference for wet grassy ground on moorland, rather than the high corries on mountains, the yellow flowered *Saxifraga hirculus* just exists in one or two sites in the Southern Uplands and the north-east. The main threat to this plant is heavy grazing by sheep.

Two other saxifrages which occur at lower altitudes are *Saxifraga tridactylites*, a small unexciting white flowered annual, quite rare on basic outcrops and the familiar meadow saxifrage, *Saxifraga granulata* which is frequent in the Borders and east of Scotland, growing in old undisturbed pasture, deciduous woodland and along sea cliff tops. It starts into growth in mild weather in the winter, often completing its growth cycle by midsummer when it dies down to underground resting bulbils. The white flowers are held on six inch high stems. A double flowered form is frequently cultivated in gardens where it is a long lived, easy, rewarding plant.

Competing with the purple saxifrage for the plant with the most vivid display, is the cushion forming moss campion, *Silene acaulis*. Individual plants often exceed two feet across, completely smothering themselves with almost stalkless rose pink flowers. It is a common widespread plant on the base rich hills and is also quite frequent on the weathered granite on the Cairngorm plateaux where it grows with *Salix herbacea* and *Juncus trifidus*. When not in flower the cushions of mossy cyphel, *Cherleria sedoides*, are easily mistaken for its close relation, *Silene acaulis*. When in flower any confusion ends, as the flowers of the mossy cyphel are an uninspiring greenish yellow. It is widespread though local from sea level to the tops of the highest hills.

The world distribution is interesting as it is one of the few species

widespread in the European mountains as far east as the Carpathians yet is completely absent from the Arctic.

Three plants all very much dependent on base rich rocks, which often occur together, are *Potentilla crantzii*, *Veronica fruticans* and the mountain avens *Dryas octopetala*. The *Veronica* whose typical speedwell flowers are a deep blue with a red and white eye, has the most restricted distribution, occurring only in the central Highlands as far north as the Cairngorms. The *Dryas* and *Potentilla* are found where suitable habitats exist as far north as the Pentland Firth. *Dryas*, the emblem of the Club, requires no description. It has an enormous world distribution encompassing North America, Europe and Asia, including Japan. In the wild *Potentilla crantzii* is a very attractive plant, relatively compact, with quite large yellow flowers, each petal with an orange spot at the base. However, in gardens it tends to become a little lax, with the loss of some of its wild charm.

Willows are an important element in the Scottish flora with many species, which give rise to much confusion through hybridisation. Four which are of particular interest to the gardener, include the tiny least willow *Salix herbacea*, a common plant on exposed ridges and mountain tops where it is indifferent to acid or base rich rocks. It is very attractive in the wild where it seldom exceeds one inch tall; the red seed capsules are ripe in midsummer, releasing white fluffy seeds into the wind. Only slightly larger is *Salix reticulata*, a plant restricted to moist, base rich rock ledges which it may often dominate. The leaves are dark green with a heavily veined surface. The upright catkins are about one inch tall, often a fine reddish colour in good forms.

The woolly willow *Salix lanata* will grow much larger in the garden, reaching as high as four to six feet. In the wild it is often less than one foot high although spreading much wider. The large yellow catkins followed by silvery leaves are very attractive. Like most willows, the sexes are on different plants; for garden display the male form is very much superior in catkin to the female form. In the wild it is restricted to base rich rocks where it is seldom plentiful; grazing sheep and deer can be a particular menace. Outside Scotland, it is common in arctic Europe and north Asia but is absent from the European Alps. *Salix lapponum* resembles the woolly willow from which it is distinguished by the smaller catkins and much narrower silvery leaves. This is a frequent plant on both acid and basic rock outcrops where it may reach four feet tall.

Avoiding the base rich rocks, the Ericaceae and other acid loving plants cover vast tracts of land, as so much of the Borders, central and northern Highlands consists of acid rocks and glacial drift, covered with a layer of peat.

The Ericaceae provides ten species, excluding *Calluna*, *Erica cinerea* and *Erica tetralix*, which require no description here. The vacciniums are the most familiar, with blaeberry *Vaccinium myrtillus* the most abundant, occurring in open woodland, heaths, exposed moors and mountain tops. This is a deciduous shrub six to eighteen inches high with distinct, bright green stems. The flowers are pinkish white followed in autumn by the familiar purple blaeberry. The only other deciduous species is *Vaccinium uliginosum* which is much less frequent as it is restricted to the higher hills. The leaves are a bluish colour and the branches brown, the pale pink flowers are small and the purple berries seldom set and ripen in Scotland.

The evergreen cowberry *Vaccinium vitis-idaea* is almost as common as the blaeberry; often the pair grow together, forming a low spreading shrubby community. The flowers are clusters of white bells followed by red berries. This species can be confused with the bearberry, *Arctostaphylos uva-ursi*, from which it is readily distinguished by the glandular dots, easily seen on the underside of the leaves. The cowberry can hybridise with blaeberry to produce *Vaccinium x intermedia* but this hybrid is very rare.

Cranberries are more often seen preserved in jars than encountered on moorlands. Two very similar species occur widely – *Vaccinium oxycoccus* is common in many wet lowland bogs in the Borders and Central Scotland, whereas the smaller *Vaccinium microcarpum* is to be found on high wet mountainsides in the Cairngorms and north-east. Both are prostrate spreading plants with attractive pink or red flowers resembling tiny *Cyclamen*. The fruit is a round red berry. The two species differ slightly in leaf shape and in the hairiness of the flower stem, hairy in *V. oxycoccos*, hairless in *V. microcarpum*.

Bearberry, *Arctostaphylos uva-ursi* is common throughout the Highlands, particularly on well drained glacial drift where it can cover the ground like a rug to the exclusion of most other plants. The leaves are evergreen with a net-like veining on the underside, the clusters of white bells are followed by red fruits which are dry and mealy inside. Sometimes included in the genus *Arctostaphylos* is the black bearberry, *Arctous alpinus* which is common north of the Great Glen, although isolated plants can be found as far south as the Cairngorms and Ben Alder. It often inhabits a zone at around 2,000 feet, where it is found on ridges and moorland with little competition. The deciduous leaves are deeply veined, resembling *Salix reticulata*. In summer they are purplish green, turning a fiery orange red in autumn. The flowers are white bells and the round berries black.

Starting at the altitude where the black bearberry grows and extending

to the highest tops, the mountain azalea, *Loiseleuria procumbens* is a common widespread plant. It will tolerate sites where the wind blows away the protective snow cover on exposed ridges and on the high plateaux. This prostrate plant will form slow creeping evergreen carpets, some of which must be extremely old due to their great spread. Each year almost without fail, they cover themselves with pale pink flowers in early summer.

As a contrast, the bog rosemary, *Andromeda polifolia* demands conditions quite the opposite from the mountain azalea, as only very wet bogs are tolerated. In Scotland it is very rare in the south and is only plentiful around Flanders Moss, near Stirling. It is strange why this species should be absent in the Highlands when it is so widespread in the arctic in Europe, Asia, North America and Greenland. In the wild it seldom exceeds six inches high, bearing pale pink nodding flowers above the glaucous leaves.

The last member of the Ericaceae is without doubt the rarest one, the blue heath *Phyllodoce caerulea*. Its history is long and chequered. It was first found in Perthshire in 1810. There then followed rumours and reports of sites around the Highlands and Islands, but none were ever confirmed until in the late 1960s four sites were found near Ben Alder in Inverness-shire. None of our five sites show any peculiar characteristics which can explain its rarity; no doubt it is an Arctic relic struggling for its survival. The foliage resembles *Empetrum* with which it frequently grows, making it difficult to spot when out of flower. The clusters of purple bells (not blue) occur in early June.

Two species of *Empetrum* are common in Scotland, *Empetrum nigrum* from sea level to around 2,000 feet; above this level *Empetrum hermaphroditum* is the more frequent species. The crowberry forms low spreading evergreen shrubs, bearing insignificant purple flowers very early in the spring, to be followed by black berries in late summer.

Three of our most attractive plants usually associated with acid moorlands and mountains have white flowers – *Cornus suecica*, *Rubus chamaemorus* and *Trientalis europaea*. The latter is most frequent in birch woodland and at lower altitudes, although it will ascend to 3,000 feet. It is common throughout much of the Highlands but is rarely encountered in the Border hills. The green leaves often have a slight shading of pink or blue, and the open upright flowers in June have a fragile charm. The common name is chickweed wintergreen, but this is misleading as it is neither related to the chickweeds or the wintergreens but is in fact a member of the Primulaceae. The leaves of cloudberry *Rubus chamaemorus* are frequently found in wet moorland sites throughout the Highlands and Border hills but good timing is required if one is to see

the large white, fleeting flowers in late June. The large orange fruit is seldom produced in quantity and must be really ripe to be edible. The dwarf cornel *Cornus suecica* is widespread throughout the Highlands, especially between 2,000 and 3,000 feet, where it can form large patches when conditions suit it. The flowers are of a stronger texture than the preceding two species and are to be found in late June and early July. What appears to be an individual flower is really a compound head of small flowers surrounded by showy white bracts which take the place of petals. This compound head then gives rise to a cluster of two to three red fruits in late summer which are well worth searching for as they are quite showy. The correct up-to-date name for this plant is now *Chamaepericlymenum*, but I think *Cornus* will be retained by most people as an acceptable name.

Compact and colourful plants are not confined solely to the mountains. The seashore provides a suitable habitat for many attractive, non-invasive species. Perhaps the sea pink, *Armeria maritima*, is the best known as it is so common and widespread. It is not confined only to the seashore but can be found on rock ledges and mountain summits, especially in the west. Much less common is the oyster plant *Mertensia maritima*, a plant which appears to be steadily decreasing and is now found only in a few scattered localities along our northern and western shores, where it inhabits a narrow zone just above the high tide. From a stout rootstock the prostrate, spreading stems radiate, with superb blue leaves with a waxy texture and tubular blue flowers.

In open turf often kept moist by either fresh or brackish water, the bog pimpernel, *Anagallis tenella* can occasionally be found, especially in June when in flower. It creeps around amongst other vegetation with prostrate stems bearing pairs of rounded leaves, from which arise the short stalked pink flowers, showy when seen en masse. This member of the Primulaceae can be cultivated in pots or the open ground but dislikes drying winds or draughts and prefers a position where it can creep unhindered across the ground.

Our most famous coastal plant without a doubt must be *Primula scotica*. It is almost always confined to short turf within sight of the sea along the north coast and the Orkney Islands. Long ago this plant must have become isolated from the other farinose primulas now found in north-west Europe as it is reputed to be unable to hybridise with them in cultivation. It is one of the few endemic plants found in Scotland. This small *Primula* seldom exceeds three inches high; the bluish green leaves, flower stalks and buds are dusted with farina and the purple flowers can be found from June onwards.

Two unobtrusive plants found locally in woodlands are the herb

paris, *Paris quadrifolia* and the yellow Star of Bethlehem, *Gagea lutea*. Both extend into arctic Europe but in Britain tend to have a southern distribution. *Gagea lutea* is a tiny bulbous plant found locally in deciduous woodland as far north as Perthshire. The fine green leaves easily merge into the other vegetation on the forest floor and as the yellow flowers are produced early in the spring, this plant may easily be overlooked. *Paris* is a much more substantial plant flowering in June, it too is easily overlooked as the flowers and leaves, both in fours, are shades of green. It has a tendency to merge in with dogs mercury, *Mercurialis perennis* with which it often grows. There are a few sites for *Paris* in Scotland as far north as Inverness-shire, in both deciduous and pine forest where the soil is a little basic.

The Scottish flora has a relatively large number of local and rare species, which are to be found scattered in what appears to be a haphazard distribution throughout the Highlands and Islands. How and where they originated is in most instances obscure.

Arabis alpina is widespread and common in the Arctic, European Alps, Himalayas, and even the mountains of East Africa. Alas, in Scotland it is confined to one corrie in the Cuillins on Skye, where it was first found in 1887. In the Royal Botanic Gardens, Edinburgh, the Scottish stock appears to be much less resistant to fungal attack, when it grows alongside European mainland plants. This factor probably points to a long period of isolation, leading to a race of plants which have evolved without contact with the fungus and hence little built-in resistance.

In 1934 *Koenigia islandica* was first found on Skye although it lay unrecognised in the Kew herbarium until 1949. It has now also been found on Mull. This diminutive annual member of the Polygonaceae seldom reaches one inch high. It is not found in the European Alps but is widespread in the Arctic, Antarctic and Central Asia.

Also on Skye and in a few other localities on the west coast and in Ireland is the unusual pipe wort, *Eriocaulon septangulare*. It is an undistinguished aquatic plant growing submerged in shallow peaty pools, the three-inch high stems are similar to a dwarf rush. Its chief claim to fame is that this species is the only member of the family Eriocaulaceae found in Europe. Outside Scotland and Ireland this species is widespread in North America. When and by what means did it cross the Atlantic?

A mountain near Glenfinnan was the site for the exciting discovery in 1951 of *Diapensia lapponica*. This beautiful plant forms low hard cushions which are covered in late May with large, pale yellow flowers. Again this is an Arctic relic with a distribution through North America, Japan and arctic Europe. Was it once common in Scotland? Has it now

retreated to one mountain top as the weather improved; could it have survived the Ice Age in north-west Scotland on this one mountain top above the ice; did a migrating bird carry the seeds in on its feet; or could the seeds have been dormant for the duration of the Ice Age on this one mountain top?

Another Arctic relic is *Artemesia norvegica*, again found as recently as 1952, this time on mountains near Ullapool. This dwarf mugwort has hairy dissected leaves; the flowers are usually solitary on stems one to two inches high. In Europe it is confined to one small area in Norway. Its main natural locality is in the Northern Urals.

Homogyne alpina has had a chequered history. This little Compositae with kidney-shaped leaves and solitary heads of pale pink flowers, was first found in 1813 by George Don. It was thought by many to be a false record, as it could not be refound, until in 1951 it was rediscovered in the very same corrie in Glen Clova in which Don had found it 138 years earlier.

The Leguminosae is not particularly well represented in our mountain flora. Three colourful and very rare species are *Oxytropis halleri*, *O. campestris* and *Astragalus alpinus*. The most widespread of the three is *Oxytropis halleri*, which is to be found on a few mountains in the central Highlands and on a few scattered sites along the west and north coast from Wigtownshire to Caithness, where it grows in well drained grass and rock outcrops. All three are low growing with pinnate leaves. *Oxytropis halleri* has clustered heads of purple flowers in late June and early July. Occasionally, *Oxytropis campestris* is confused with *Oxytropis halleri* but normally the former has pale yellow flowers, often with a purple tip. Plants almost intermediate do occur and they can be difficult to place. *Oxytropis campestris* is confined to rock outcrops in the central Highlands. *Astragalus alpinus* is also confined to the central Highlands where it frequents grassy areas rather than rock outcrops. The rich blue-purple flowers are produced in June and July on low spreading stems.

Two other very rare plants only occur on the Angus and Aberdeenshire hills. *Lychnis alpina* is known only from one small site, where it is confined to a small area of serpentine rock. The small clumps send up flower stems one to three inches high with terminal heads of rose red flowers. At the other extreme, *Cicerbita alpina* reaches as much as six feet tall with large purple flowers like sow thistles. It is confined to a few cliffs out of the reach of red deer which will readily devour it. This species is widespread in the mountains of Europe and the Arctic, where it may be found growing along roadsides, competing successfully with rough plants such as willow herb, *Chamaenerion (Epilobium) angustifolium*.

The rich mica schist hills of Perthshire and Angus provide a suitable habitat for some very rare species. Our only true gentian, *Gentiana nivalis*, can still be found in short turf on only one or two mountains. It was first found as long ago as 1792 by James Dickson. This small annual or short-lived perennial seldom reaches more than one inch high and is difficult to find as the flowers tend only to open in bright sunshine. James Dickson also found the very rare fleabane, *Erigeron borealis*, in 1789. This plant has a preference for ledges on cliffs where it forms small clumps with erect flower stems, four to six inches high. The daisy-like pinkish purple flowers are produced in late June. A third plant, again found only on two mountains, is the small and compact alpine forget-me-not, *Myosotis alpestris*. The intense bright blue flowers glow even on a wet misty day. It will ascend to 3,900 feet on the mica schist rocks; although very rare, where it does occur, it is often in great abundance.

Many of our native plants have a very restricted distribution, but few species have been lost altogether. Two which have not been recorded for a long time are *Pinguicula alpina* and *Rubus arcticus*. The *Pinguicula* was lost when the bog in which it grew in the Black Isle was drained. This is a very distinct butterwort; the large white flowers have a yellow spot in the throat. The *Rubus* is a low growing bramble with rose-red flowers. It has been recorded in the past from Mull, Ben Lomond and Beinn A'Ghlo. There is a good chance though, that it will still be refound one day by an observant hillwalker.

It is important that we refrain from collecting our native plants if more are not to be lost. The law prohibits the collecting of all our native plants and conviction for collecting many of the rare species mentioned in this article attracts special penalties. All the rare species which make good garden plants are available from nurseries or through seed exchanges. It is much better to leave the plants in the wild for all to enjoy, rather than to kill a plant trying to establish it in the garden.

The cultivation of high alpines

DUNCAN LOWE

The W. C. Buchanan Memorial Lecture delivered on 11 September 1982

I HAVE produced a written account of this lecture before but it was based on the original offering, put together seven or eight years ago. The content has altered since then and continues to do so; some puzzles are solved but new ones take their place and others become more complex as I pursue this hobby with perpetual fascination.

I am too young to have been a contemporary of William Buchanan but I have read of his work and his character and feel that regularly revising ideas and practices in the light of experience and enquiry would have met with his approval. So, here is the revised write-up with much that is in harmony with the original but benefiting, I hope, from a few more years in mountains and gardens.

When the conditions prevailing in the domain of high alpines are known then the proposition of introducing those plants to cultivation would seem to have about the same chance of success as an attempt to grow bananas in our British gardens. Yet a respectable number of these highly adapted plants not only survive but flourish, given a modest amount of help to cope with an environment so very different from that of their origin. With a little more contrivance the determined grower can persuade many more to accept a life in exile, which is the essence of the plantsman's craft, but to do so he needs more understanding of the species in his care and to obtain an essential part of that understanding he must go to the mountain.

And that is really where this account begins; with the ascent of the mountain by a gardener, looking with the gardener's eye, not only to find the plants but noting where they grow and where they do not, the substances in which they root, the positions they prefer and so on, discovering things that will guide and modify his technique and outlook when he returns to resume his cultivation of these truly wild plants.

Having said all that it is not always necessary to reach altitudes to find 'high alpines' for some species reappear almost at sea level in Alaska and similar regions, where *latitude* has produced a terrain and environment matching those of the mountain slopes, generating the same responses in adaptation and survival. However, the majority are to be found in exciting and majestic mountains and it is there that we now begin the climb.

Emerging from the last stunted outliers of the trees clothing the lower slopes the ground is well clothed in pasture herbage, with many plants that are now old favourites in the garden borders. They are scythed down in July to form the floral hay of the alpine farms yet, such is their vigour, they arise next spring undiminished, indicating the benevolence of the growing conditions and the wealth of sustenance. A few hundred feet of further ascent, however, is sufficient to bring a marked change; the stones are now showing through the turf, the slope is steeper and the plants are smaller. No longer do they raise long stems to bear their blooms or produce heads of foliage. They crouch and progress by crawling, their leaves are smaller and the flowers stay close and it makes sense, because with increasing altitude comes increasing harshness of weather, with winds that would carry away a soft flower spike or rip and dehydrate expansive foliage.

With a further climb the edge of the high alpine's domain is underfoot, where the turf declines into scabs and tuffets showing that only here and there is there now sufficient humus to sustain grasses and herbs. In the European Alps and Pyrenees this zone is around 7,000 to 8,000 feet and from there up to the edge of the summer snowline the high alpines live, specially adapted to the spartan conditions and protected by their ability to survive where competitors can not. In human terms they compare with the Eskimo or the Australian aborigine, able to obtain adequate for their needs in a place where others would rapidly die.

The high regions are varied in form and substance; great crags and cliffs rise from fanned heaps of scree, hanging valleys are floored with moraine while some summits reveal a plateau of shattered stone. All

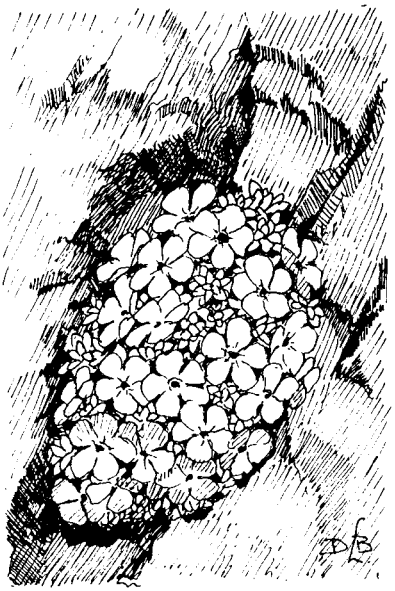
these have been colonised by plants, some much more than others as the next stage will show. This involves ranging along the mountain seeking out the species and carefully noting anything relating to the apparent success of that particular plant in that particular spot. It is frequently a good reason for not 'doing the summit' because very often the top is covered in snow or botanically barren.

Great rock buttresses are tempting objects to visit and touch and they are homes for some of the most highly evolved and visually startling plants. Typical of these is *Androsace vandellii*, probably the slowest growing of the genus and only ever found as a crevice dweller. It is often and wrongly quoted as requiring the protection of an overhang to shield it from excess sun and rain, but if the water supply to the roots is adequate it will thrive and flower profusely in full sun on an exposed rock face. The plant does occur frequently beneath overhangs but then in an exceptionally dry season those with shade will have the advantage in surviving drought over those fully exposed.

Androsace vandellii and others that dwell exclusively in cracks and fissures, belong to a group that has undergone a remarkable evolution, but why should they apparently shun the relatively richer ground surrounding their cliff and boulder eyries? The most tenable explanation is that they have retreated from competition with other species possessing greater vigour, procreativeness or tolerance and only when they attained ground that starved and stunted their adversaries could they survive and colonise. That survival, however, required special abilities and features. A far-reaching and highly efficient root system had to be developed to penetrate the finest crevices and having done so, make the most of the meagre nutrients found there. Equally deep searching was necessary to reach a reliable moisture source and in consequence the roots of these rock dwellers can be ten and more times as long as those of comparable plants in easier habitats. Such is the sparcity of food however that further mechanisms have had to be modified to utilise every source of sustenance. From recent studies it is now known that these saxatile species have enhanced photo-synthesis, so making the best possible use of sunlight for the food conversions. Nitrogen is probably the best known constituent in plant foods but in fissured stone there is very little of it and so the adaptation had to include a greatly reduced need for nitrogen, a characteristic that is quickly proven by the plant's decline if a 'normal' amount of nitrogen is included in its cultivation diet.

Only a few of the rock-inhabiting type are wholly dedicated to that way of life; the majority can also be found elsewhere and frequently on the screes and morraines, their special abilities being well suited to life

on a pile of stones, which describes, essentially, both of these geological features. The two have also in common, a dynamic and a passive state.



A dynamic scree is in constant movement, fed by the peaks above where frost and thaw unendingly cleave and fracture the solid rock into flakes and cobbles that rattle down to join the millions already heaped below. Understandably such places are virtually devoid of vegetation, for not only would any plant have to tolerate regular scissoring of its roots below ground but also withstand frequent bombardment above it. A beautiful exception is *Papaver rhaeticum*, which somehow prevails to raise its bobbing golden flowers in shattered limestone scree that can ruin a pair of good boots in a single day.

Dynamic moraine is the rubble produced by the awesome force of a glacier on the move and is even more hostile to plant life than the scree.

When some major movement blocks a stone chute, or when a glacier recedes, the passive state begins and the quietened heaps of debris are soon colonised, first by blue-green algaes that persist to eventually provide a footing for lichens, which in turn will allow mosses to creep in. Generations of moss leave tiny accumulations of humus and when this is lodged in sufficient quantity the higher forms of plant life can find places to live. Typical are the campanulas, their nomadic habit, born of searching for those pockets of food, lingering only to exploit them then wandering on to find other deposits. Another is *Thlaspi rotundifolia*, short-lived and so needing only a limited food source but, spraying its tough and energetic seeds all around to find a hospitable spot to perpetuate the species.

Superficially screes appear arid, the surface stones being dry and with a total absence of any feature where water could linger, the drainage being just about absolute. Yet not far below its skin the scree or moraine does hold water sufficient for the deep seeking roots of its flora, either in the form of seepage from snow melt above or as remnant

moisture films from past thaws or rainfall, with evaporation retarded by the shade and insulation of the upper layers of shards and pebbles.

Another substance akin to scree but far finer in structure is to be found where there is friable rock, such as shales and schists, which are rapidly and continuously broken down by the weather to produce a gritty mineral flour reminiscent of pit-head slag both in texture and appearance. Wherever this material is regularly moistened it supports a variety of high alpines, yet there is no humus in the stuff nor does it hold any other organic matter that might be transformed into nutrients. It can only be concluded that a form of natural hydroponics is at work, sustaining a reliable flow of dissolved chemicals released from the freshly granulated soft stone. This presumption is supported by some limited but interesting analyses of mountain 'soils' which revealed proportions of elements considerably exceeding those found in our old and leached lowland grounds. Prominent in those elements is potassium (potash to the gardener), which is rapidly depleted by rainfall and requires regular replenishment where flowers or fruits are cultivated but, on the mountain it is continuously topped up wherever speedy break-up of rock occurs.

All plants must have light but in varying quantities and levels and the high mountain regions have a particular quality of light. With increase in altitude comes thinning of the atmosphere and in consequence a reduction of its filtering effect on sunlight. The summits and high grounds therefore receive sunshine which is not only more intense but also richer in ultra-violet light. No complex apparatus is needed to show that this is so, it is sufficient to see the painful inflammations and sores inflicted on unwary climbers who respond to the sunshine as they would on a beach. It is not unusual for the peaks to be bathed in sunlight whilst the valleys and lower slopes are smothered in cloud and so plants at the high levels enjoy more sun than most of us imagine. Very few of the species actually seek shade, consequently they must be regarded as sun-lovers and accustomed to a growing season with quite plentiful and intense sunshine.

The melting snowfields provide copious quantities of clear, fresh, cold water to irrigate the ground and provide a guaranteed supply throughout the entire season of growth for many of the high alpines. Others, however, in crevices or on slopes where snow melt is exhausted beyond the spring, rely on periodic soakings to maintain their moisture needs and they get them, from thunderstorms, unseasonal snow or sleet flurries and mists. The cisterns and catchments in the cracks and debris retain a little of whatever falls and hold it for the water-seeking roots to absorb. The gardener must not be deluded by

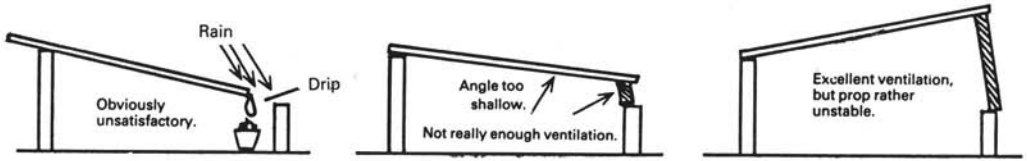


Fig. 52 Ventilation of frames (see page 207)

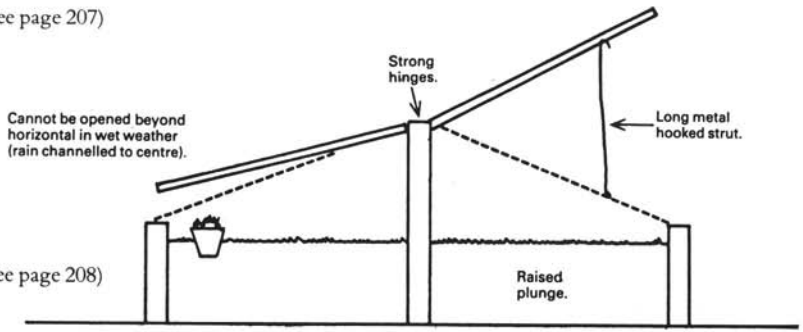


Fig. 53 Keeping frames open (see page 208)

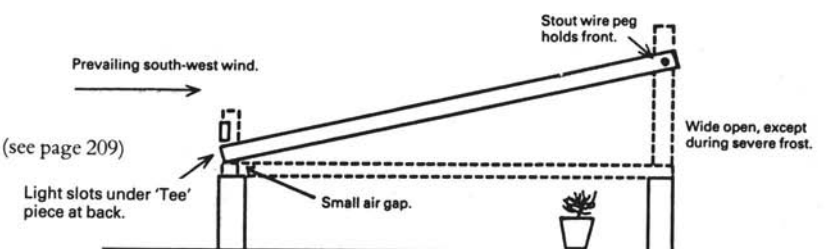


Fig. 54 Frame construction (see page 209)

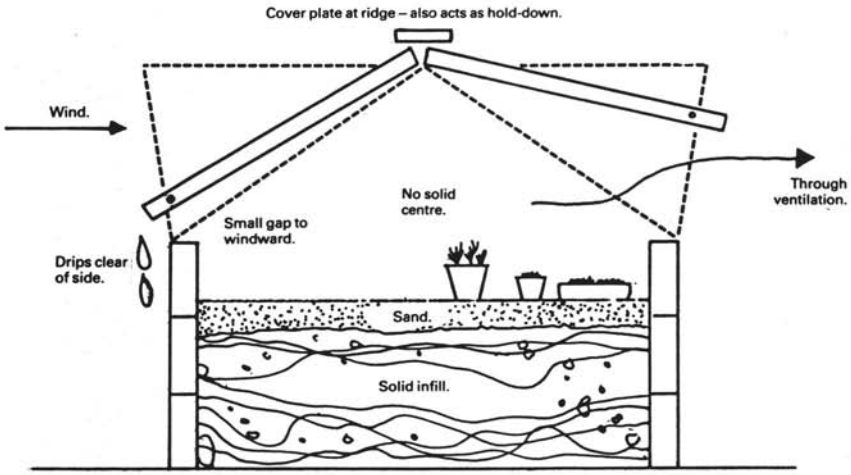


Fig. 55 Frame for seed pots (see page 209)

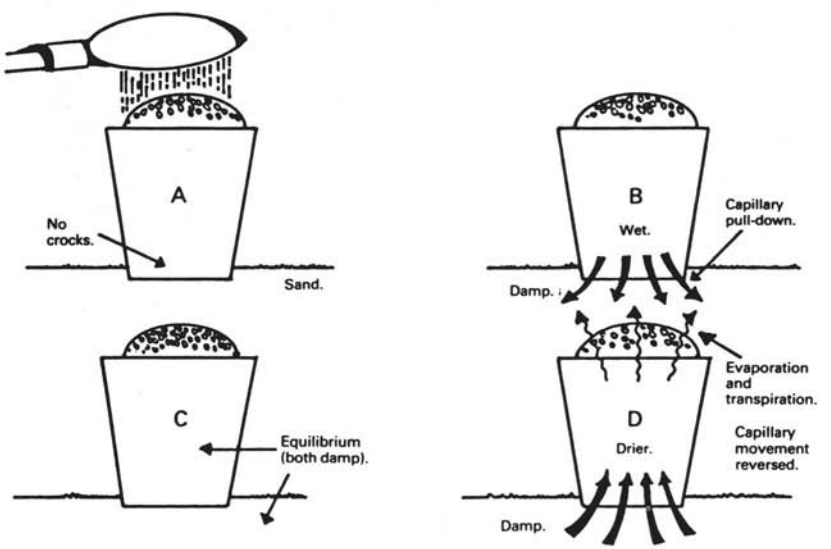


Fig. 56 Capillary buffering (see page 217)

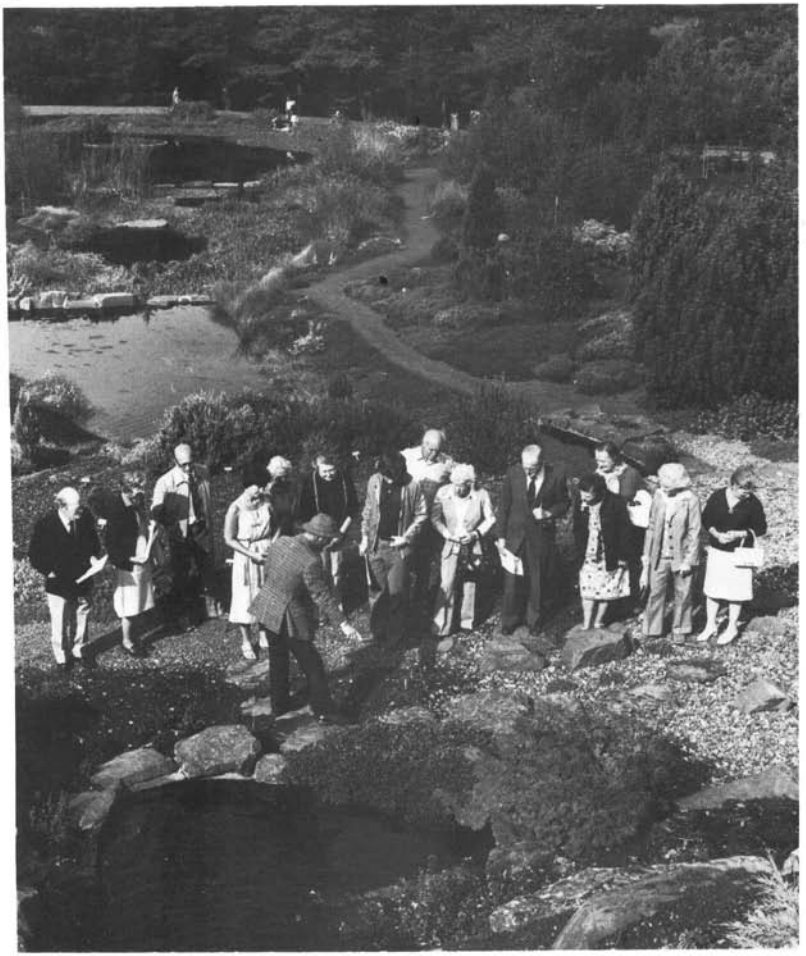


Fig. 57 St Andrews Botanic Garden (see page 263) Photo: Robert Mitchell

Fig. 58 *Fritillaria latifolia var. nobilis* (see page 277) Photo: Lynn Almond

Fig. 59 *Corydalis solida* 'George Baker' (see page 289) Photo: Ron Bezzant

outward appearances and regard the saxatile plants as somewhat akin to succulents, seeing their love of sun and the dry rock of their perches. They need consistent moisture at the root but abhor soggy conditions. In the buoyant atmosphere of the high places there is frequent change, banishing persistent dampness, flushing out stale water, drying off surplus wetness; the whole environment is constantly refreshed.

Time is short for the full plant cycle, cramping the work of growth, flowering, seed production and ripening into the ten or twelve weeks between the emergence from melting snow to the first new falls of autumn. Compared to this the herbs of our lowlands have a very leisurely timetable, stirring themselves in March and eventually shutting down in October or November – eight months to achieve the cycle for which the mountain allows only three!

But then comes what is perhaps the most crucial difference in life style, with the dormant state. Winter is kind to high alpines; it is a constant condition, providing, in most cases, a covering of thick dry crystalline snow to maintain a fixed ground temperature, deter any predators, inhibit fungi and viruses and ensure total protection from the searing winds. A few species are excluded from this cocooning by their preference for exposed ridges or slabs which do not hold snow and so have developed incredible hardiness, but they are exceptions and in general we should not expect tolerance to severe frost or biting winter winds in high alpines; they do not experience them and so have had no need to evolve a resistance to them.

There is much more to observe, study and record but this is only a brief account and accepts that years of such wanderings and study would not exhaust the discoveries to be made. Time now then to apply what has been learned to our purpose – the cultivation of high alpines, which on the face of it is a ridiculous proposal. Consider what prevails in our gardens that is alien to the sublime heights, things like greenfly, blackfly, whitefly, thrips, slugs, earwigs, cutworms, mildew, botrytis, false springs, snap frosts, freezing fogs . . . and so on, none of which occurs in the homeland of the high alpine plants. They have never met these adversaries and consequently have had no need to develop a resistance to them, yet if the plant ails in its trough or bed we have the audacity to label it 'difficult to please', if you please.

The remarkable fact that we can grow a respectable number of species owes a lot to trial and much error but there are basic measures that will help which have originated in those mountain observations.

On receiving a rare or choice plant the impulse of the thoughtful grower is to put it in a pot and for good reason, because by doing so the plant can be given individual attention. The soil mixture, drainage,

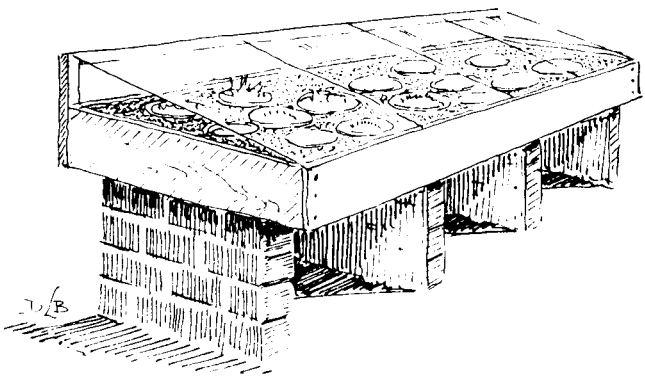
watering and light are under direct control and with reasonable exclusion of pests the gardener will see the response and correct anything which appears inadequate or excessive. When he has thus learned the plant's preferences (assuming success) the grower then has a rough formula to guide him in its future care. Firstly then we will consider pot growing in the light of what has already been said.

Soil mixtures have become a fetish, with claims being made for success of this or that species only if a recipe of pharmaceutical exactness is followed and includes 'special ingredients' for which there are no substitutes. Such are the convictions of those concerned in this lore that frequently the principal question directed at successful cultivators is – what is the soil mixture you use? The mixture is important but not crucial, as practical experimentation by responsible growers has shown that it is the structure that should receive most attention to achieve the balance of good drainage with the right amount of retained moisture. A well tried and still used mix is 3 parts of coarse grit or very coarse sand to 1 part of crumbled leaf-mould, by volume. This can be regarded as one extreme with the other as 2 parts coarse grit or sand to 1 part John Innes No. 1 or 2 potting compost and there are numerous variations in between, with bracken litter doing just as well as leaf-mould, crushed tufa or old brick substituting for grit and so on. The lean 3 grit, 1 leaf mixture is safe and proven but requires a regular watch against drying out, whilst the richer 2 grit, 1 J.I. can encourage more pests and diseases and might be over-rich in nitrogen. And of course it depends *where* it is being used. In the north-west of these islands leaner mixtures prevail because rainfall is higher and air moister, so there is less danger of drying out, whereas in the drier south-east more 'substance' is required to prevent rapid drying.

There are other reasons for growing alpines in pots, even though it can be likened to keeping a swallow in a cage. The plant is portable, allowing it to be moved around to gain most when conditions are beneficial and protection when they are adverse. And, of course, it can be taken to the shows or along to other growers for admiration (and sometimes post-mortem). When raising seedlings or rooted cuttings in pots, they can be given the individual attention during the vulnerable stages of infancy. So there are good arguments for growing some plants in pots, but why the widespread urge to assume that the pot must then go into an alpine house? So often comes the lament, "I'm afraid I can't grow the rarer stuff because I haven't got an alpine house."

With the exception of a very few genera from the mountains of hot regions, such as Dionysia which seems to appreciate the stuffy dryness of an alpine house in summer, the rest are far better off out of it when

they are not dormant. They can be just as well cared for in the growing seasons in a plunge bed open to all weather from March to October and in the winter they can be protected from the rain by overhead glass. The latter is also about the best way we have yet found to simulate snow cover, though it is a very poor substitute. In spring, summer and early autumn glass is no benefit at all, however well ventilated, for not only does it reduce the amount of light reaching the plants, it also filters out the ultra-violet component, the very property that is more abundant in the light at high altitudes. Little wonder that alpines permanently resident in glasshouses are frequently drawn, less floriferous, and more pallid than those in the open air and sunshine of the garden. There is no intention here of condemning the alpine house; it has its uses, no better appreciated than on a miserable winter weekend when it allows the grower to potter around the sleeping plants, protected from the sleet, rain, wind or whatever that is precluding any outside activity. Nevertheless, apart from this luxury the raised plunge bed will do all that the alpine house can do in winter, and in the summer it is superior.



A raised frame, something like the one illustrated, allows the 'roof' to be taken away completely for the growing period of March to October, ensuring that it then receives maximum benefit from the rather thin and erratic British sunshine. Once out of their dormant state high alpines do not seem to mind the frequent drenchings, and even those muggy spells that our summer can produce, provided that they have been given the growing environment already discussed, i.e. drainage, surface covering, open rooting medium and all the fresh air and sunlight available. This approach and practice has produced years of very rewarding results in a wide range of alpines, including such

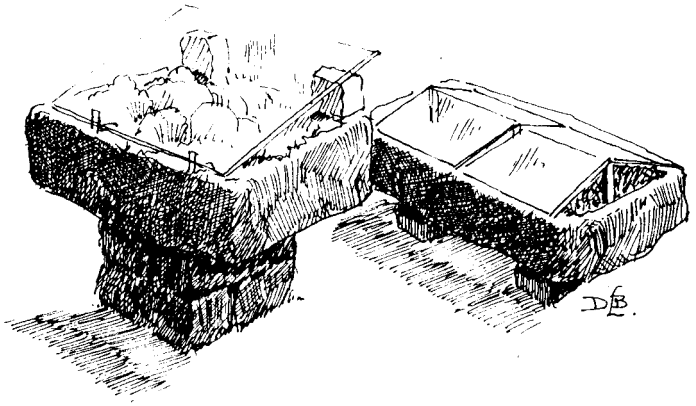
plants as Aretian androsaces, eritrichiums, raoulias and so on, which are frequently described as 'alpine house' plants.

One of the most decisive examples of the improved response to the outdoor approach has been that of *Androsace alpina*. This beautiful pink-flowered cushion is quite adaptable in nature, yet authoritative references in books and articles regard it as difficult to maintain in cultivation and very shy of flowering, the unanimous recommendation being that it . . . "be given the special care of the alpine house". The glasshouse syndrome again! The sight of specimens reared in that manner was sufficient to trigger the almost belligerent reaction of . . . "well it certainly isn't doing any good there, let's try something quite different". A potted seedling was put in the raised open frame in spring and left there. The outcome was astonishing. The lax and leggy growth threw up new tight leaf rosettes of a healthier green and obvious vigour, rapidly combining to form a cushion, not as tight as the wild version, but a great improvement. Late in May pink pin-heads appeared in the foliage and a few days later the plant was spangled with flowers. It was moved to a larger pot in June (because of its rapid growth) filled with old reliable 3 grit to 1 leaf-mould and the cushion was 'jacked up' by inserting large slate fragments beneath it. The plant stayed in the raised frame for the winter and the glass cover was removed in March of the following year. On the first Saturday in May it sat on a show bench smothered in bloom and with a Farrer Medal. Since then this species has shown similar appreciation of the same treatment for other growers in various parts of the country, and it has produced equal results when not grown in a pot, but allowed to nestle in the stony coverings of troughs and scree beds, given only a pane of glass during winter to keep off the rain; and that leads to the next step!

Once free from the 'pots in glasshouses' complex the grower has new horizons to scan. Why stop at pots? After all a trough is merely a large pot and allows a similar degree of control over the conditions contrived in it, and in winter a pane of glass propped over it turns it into a tiny raised frame.

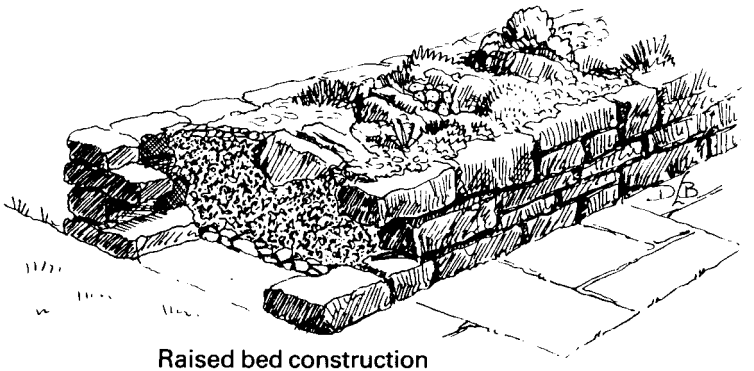
Some very fine alpines are grown in troughs and the high-dwelling plants are excellent subjects for this method with their compactness and slow growth. Once established they settle down to produce tight healthy plants and remain contented for an amazing number of years with little attention other than keeping them free from pests, especially aphids, the worst enemy of high alpines, closely followed by slugs.

It is only another step in scale from a trough to a raised bed, for what is the latter but a large trough. The raised bed represents the present stage of evolution in alpine gardening and has replaced grottoes, miniature

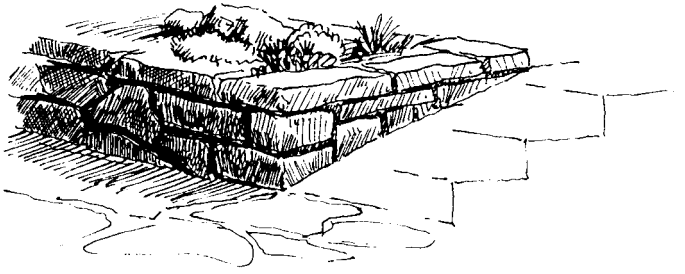


Matterhorns and rockeries, all of which seemed to be trying the same ploy of tricking the plants into thinking they were at home by erecting imitation alpine scenery around them. The raised bed has forsaken the mock mountain terrain in favour of good drainage, simulated rooting medium and the essential water-shedding, quick-drying surface. It can be built to look pleasing and does not need rocks so far as the plants are concerned, although they can be added to create crevices or to decorate the surface.

Alas, another jab at popular gardening literature is called for in relation to building alpine beds. Unless your land is gravel or coarse sand based, it is a mistake first to excavate the site and fill in with rubble, as is all too often recommended, for in doing so a sump is created which will collect the surplus water from the surrounding ground and store it. When, as is also specified, the bed is then built up above this shallow pit, the soil mixture acts as a wick and ensures that the whole thing is maintained in a soggy stagnant state. Just what alpines do not want! The bed must shed excess water quickly, and if it is built up from ground level it can cope. The illustration shows the simplicity of such construction. The walls are of semi dry-stone build, with only the top layer keyed with cement here and there to prevent dislodging. The height of the walls is about 15 inches and although taller beds bring the plants nearer to the gardener's eyes and hands they also suffer from increased settlement, which can be a serious problem. A bed, 30 inches high, however well trodden down and beaten during filling, will settle at least 4 inches in a couple of years or so, requiring the plants to be dug out and replanted after 'topping up'.



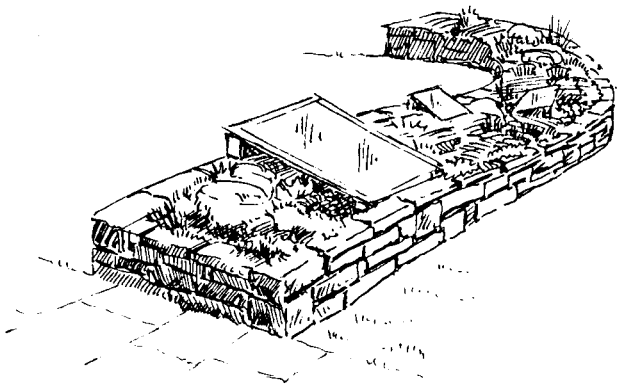
Raised bed construction



The same principles on a slope

Winter protection for those plants benefiting from it can be simply a piece of glass and an anchoring stone as used for the trough or, where a group is concerned, a frame light can be propped over the area occupied. Unattractive, admittedly, but then these covers are only needed from late October to early March, during which period a saunter round the beds is a rare event. For the rest of the year the reward is clumps of high alpines enjoying the outdoor life and showing it. A colony of *Androsace vandellii*, eight in all, has prospered for several years on a raised bed built as described, asking only for a cold frame cover over its head in winter. The bed mentioned here is filled with a mixture of 70% stone chippings and 30% organic material, by volume, the organic portion being a hotch-potch of leaf-mould, peat and a little loam.

The success of this bed led to a bolder experiment, requiring the construction of another stone wall surround but this time only 8 inches



high. It was built straight on to the intractable, sticky yellow clay, with which this particular garden was cursed, and filled with a mixture of 1 part limestone chippings, 1 part black sedge peat and 1 part coarse sand (all by volume). A handful of John Innes base fertiliser was added to each barrowload (2 cwt) of the mixture to provide a little in the way of immediately obtainable nutrients for the plants, but no further 'feeding' was carried out subsequent to that starter. Two years after planting, it had a mature look and housed a very cosmopolitan population of androsaces, saxifrages, daphnes, primulas, campanulas, corydalis, raoulias and even *Dionysia aretioides*, which was the only occupant to be given winter protection. The whole thing was left behind in the last house move, but it was still a delight then, in its fifth year.

There are no absolute rules in gardening but in concluding this article it is worthwhile to summarise the obvious features and influences observed in the wild and to relate them to cultivation.

The 'earth'

High alpines grow in rock fissures, scree and stony slopes where, in every case, the drainage is absolute and countless tiny cavities ensure that the roots have oxygen. There is little humus available to them but whilst nitrogen is scarce other elements are well supplied by the fierce action of weather on the rock. The plants cling to surfaces that shed water and dry rapidly.

Water

Snow-melt, storms and cloud provide a reliable supply of fresh cold water to the roots. Soggy sour conditions are rare and avoided by the plants.

Light

In the short growing season for high alpines there is a high proportion of sunny weather, providing a strength and quality of sunlight denied to lower altitudes.

Air

The atmosphere in the high levels is rarely placid, conditions are constantly changing giving a buoyancy to the environment.

Hibernation

Throughout the long alpine winter the majority of high alpines are fully dormant, untroubled by weather, pests or diseases, beneath their refrigerated covering of snow – in the dark.

Cultivation

It is impossible to recreate these conditions but the gardener can strive to simulate or substitute for them. The growing medium should, above all, be open in structure to give drainage and airyness yet possess a measure of fibrous or porous material to retain sufficient moisture for the needs of the plants without creating staleness. The best we can do is to incorporate gravel and chippings with substances such as leaf-mould, bracken litter, low acid peat, etc, and to avoid including too much soil.

To create an acceptable 'seat' for the plant the pot, trough or bed can be surfaced with chippings, or better still flakes of stone or shale, to shed the water and ventilate the base of the plant. Such coverings also retard moisture loss in the root run during dry periods.

We can not rely wholly on rainfall in the growing season. No meltwater percolates through our simulated screes and crevices and in the occasional dry spell we have to supplement natural events by watering. The dainty sprinkling round individual plants on a summer evening, so often seen, is quite inadequate. Troughs and beds will usually keep the plants adequately supplied from reserves of moisture for a week of drought but when water is given it should then be copious, to replenish all the water retaining material. After such a drenching no more is required for several days. The same applies, more or less, to pots in plunge beds but with a shorter period between waterings as the roots are prevented from delving deeply as they do in the open garden.

In the dormant period, which in cultivation is say, from late October to late February, there is usually no need to give any water to plants in covered plunge beds and in the alpine house an occasional wetting of the plunge material is usually sufficient.

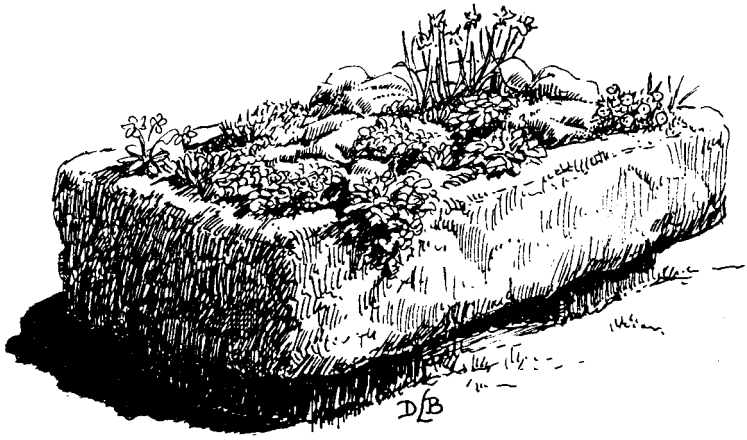
There is little to be done about the atmosphere in which our plants are grown other than to avoid any spot that becomes noticeably oppressive or musty, indicating sluggish air movement and humidity, hence staleness.

Our British sunshine is a poor substitute for the light on the mountain, being not only infrequent but also diluted by the lowland atmosphere. To make the best of it the plants, whether in pots, troughs or beds, should be placed in an open area of the garden where they will be in full sun for as much of the day as is possible. If that spot is also well supplied with fresh air currents then so much the better because stuffiness can create a baking effect which the plants will resent.

It is doubtful if our cultivated plants are ever truly dormant, the rest period being less than half of that in nature. Nevertheless they do shut down and it is in that state that they are most vulnerable. Whilst active they do not suffer from drenchings even in our summers when they can be permanently saturated for weeks but persisting wetness in winter is lethal to quite a few high alpines, particularly the cushion forming species. Lingering moisture supports fungoid growth and attracts certain pests. To help the plants all we can do is to prevent the rain from reaching them but at the same time ensure that they are well ventilated.

With the exception of many cushion types, however, there are quite a lot of high alpines that will go through our winters unscathed without overhead cover, provided that the other conditions of excellent drainage, elevated site and a properly contrived surface are provided. We are tending to move out of the glasshouse and so we should; after all ours is a gardeners' Club.

There is more than a suspicion that long lists of other people's plants tip over the edge of interest into the gulley of boredom, and so it is hoped that the plants already mentioned give enough of an idea of the variety of types that have settled reliably in cultivation. Enough, hopefully, to encourage a less timorous approach to cultivating high alpines.



Primula aureata

FRED HUNT

WHILE appreciating the fact that much has been written of this particular species in the past, it may be of interest to growers of this desirable primula to learn of my good fortune with a plant, bought in the autumn of 1981.

The particular plant was kept frost-free throughout the extremes of the ensuing winter. However, after flowering under the protection of the alpine house, thereby allowing me to enjoy its beauty, and having been cross pollinated with a plant of *P. aureata forma*, it was plunged in a cold frame in shade to spend the summer months.

On periodic inspection it was noticed that offshoots were being produced, so I decided to detach these as and when they were of manageable size. This was done, taking care to ensure that any slender piece of root was not damaged in the process.

These were then potted up in a sandy/peaty mixture and placed under a plastic dome in shade in order to minimise drying out.

This way, seven little plants were established, and, grateful as I am for this generous increase, low and behold, the mother plant went on to set seed.

This was duly sown on 26 August 1982, the outcome of which is anxiously awaited, although I have doubts as to the viability of the seed.

Nevertheless, I am highly delighted at this particular rate of increase with the offshoots. Has any other member enjoyed this good fortune? Or has this just been an obliging plant?

PS – On checking seed pans today (7 April 1983), some of the seed has germinated!

PERMANENT LABELS

We have had a plea from a member for advice on where to obtain permanent labels, which are cheap and not easily pushed up out of the ground in winter. The member also asks for advice on the best type of pen or pencil for a permanent name on the label. Any suggestions will be welcomed by the editor.

Seed germination

THE next section of this issue of *The Rock Garden* is concerned with various aspects of seed germination. Too many people fail to germinate their rock garden or alpine seeds because they fail to observe a few basic principles. From what one can gather the success rate of people who buy seed at our shows or at the stand at the Royal Highland Show is very low indeed.

Members who do not take part in the Club's 'Seed Exchange' are usually unaware of the three excellent leaflets which are available to guide people sowing seed. In order to make them more widely known and to try to improve germination success rate, they are reprinted here. Produced by three distinguished plantsmen – Alex Duguid, Jack Drake and the late Henry Tod – they are simple, easily followed guides to seed raising.

Following these leaflets is an article by John Aitken which is a practical and highly successful gardener's guide to raising alpines from seed. There should be many useful tips therein, even for the most experienced gardener.

Propagation by sphagnum

Alex Duguid

The raising of seedlings by means of sphagnum – especially those of the order Ericaceae – is a ready method for seeds which are difficult to raise in the more usual seed mixtures. Its great advantage over other mediums lies in its ability to retain moisture, thus avoiding drying out, which is so disastrous for germinating seeds. There are several species of sphagnum, but I prefer the form which grows on high moors, and is usually of a pink or deep crimson colour. Other forms will serve, but sphagnum gathered from ditches invariably has a slimy growth accompanying it, which can continue to grow in the pots and strangle the seedlings.

Spread the moss in the sun, turning it till thoroughly dry; then rub it through a quarter-inch sieve with the hands (or a stiff brush can be used with advantage). When this is completed you have a medium not unlike

rubbed leaf-mould – fine and springy. I dry this out again, either in a heated greenhouse over pipes, or in a slow oven until it is very dry and crumbly. This is to ensure that the sphagnum is dead, as, if it starts into growth in the pots it will kill the plants. Have ready sufficient, scrupulously clean pots, crocked as for ordinary sowing. Soak the sphagnum in water, squeezing out the surplus, and pack it into pots to within half an inch from the top for fine seeds. Sow the seed very thinly, and label; then spray lightly to settle the seed, but do not cover the seed. The foregoing is suitable for Rhododendron, Phyllodoce, Menziesia, Shortia, Diapensia, Cassiope, etc., and for certain Primulae of the Soldanelloid section.

Lilies and their near relatives require slightly different treatment. Prepare the pots as before, but only fill them three-quarters full, then sow the seed, and cover with sphagnum to within half an inch from the top.

After-care consists of seeing that the pots never dry out, and in hot weather spray with a mist spray. Pots are best kept in a greenhouse, either cold or heated – naturally in heat the seedlings grow more quickly, but in a cold house they make satisfactory though slower growth. If the seedlings come up quickly, certain species, i.e., Rhododendron and Primula, benefit from being thinned out at the first leaf stage. Treated thus, they make sturdy seedlings and grow away more easily when pricked out. Ericaceous plants I leave until the following spring before pricking off, but Primulae are best done when they have three pairs of leaves. Liliaceae I do not prick out, but transfer the pot of seedlings into a ten-inch pot, filled with a suitable compost; the seedling roots can then grow through the ball of sphagnum into the compost.

By the ease of this method of propagation, many interesting and difficult plants may be raised with the minimum of trouble.

Alpines from seed

Jack Drake

Raising alpines from seeds is one of the most fascinating forms of gardening, and there is nothing very difficult about it provided that you are prepared to make the effort to provide the essential requirements.

These requirements are:

1. Some cold frames and/or a cold greenhouse.
2. Pots or seedpans about 3 to 6 inches in diameter.
3. Crocks, small stones or coarse grit for drainage.

4. Some good loam (sterilised if possible – consult your nearest nurseryman or sundriesman).
5. Good quality peat moss, or leaf-mould if sterilised.
6. Some coarse sand – river sand is best.
7. A small bath, tub, etc., in which pots and pans can be immersed.
8. A half-inch riddle and a small quarter-inch riddle.
9. A small, round, flat-bottomed tin or box.

Take your pot or pan. See that it is spotlessly clean (a dirty pot will immediately encourage mosses, etc., to spread over the surface of the soil) and fill with crocks, small stones, etc., up to one-third for pots and quarter for pans. Cover the crocks with a few coarse leaves or other suitable material to prevent soil from clogging the drainage.

For your compost, pass two parts of loam and one part of peat moss (or leaf-mould) through a half-inch riddle. Add one part of coarse sand and mix well together. Fill your pots and pans with this compost to within about one inch of the rim, pressing the soil down firmly.

For the final dressing before sowing, pass one part of loam and one part peat moss (or leaf-mould) and one part of coarse sand through a quarter-inch riddle and mix well together. Place a handful of this compost in the quarter-inch riddle, hold over the pot and tap gently until about a quarter of an inch of compost has fallen. Make the surface quite even and flat by pressing gently with a small, round, flat-bottomed tin.

Sow the seeds evenly and fairly thinly and cover lightly with the compost through the quarter-inch riddle. Do not cover the seed deeply. Very fine seed, such as Saxifragas, Rhododendrons and some of the Primulas should not be covered at all. Others should be covered by a depth of soil not greater than the diameter of the seed.

Make sure that the pots are clearly labelled. The date of sowing placed on the label will be found of use and interest as many alpines take a long time to germinate and no pan should be disposed of until at least two years old.

Now place the pans in a bath or tub and fill the bath with water up to two-thirds the height of the pots. Remove the pots as soon as the water is seen to have soaked through to the top of the soil. If possible, never water seeds from above, but always by immersion of the pots in the bath.

Place the pots in a cold frame or cold greenhouse and cover with newspaper. Plenty of air should be allowed. The pots should be examined every day for germination and to see if further moisture is required. Never allow the pots to dry out, but also be careful not to overdo the watering.

For small quantities of seed a proprietory seed compost could be

used, those containing sand are the most suitable. If using soil-less seed compost, great care must be taken to ensure the medium never gets too dry, it is extremely difficult to moisten once this state has been reached. If using plastic pots, remember these are non-porous, therefore very easy to over-water. To help avoid this, a quantity of coarse sand could be added to assist drainage.

As soon as a pot is seen to have germinated, it should be removed at once to another part of the frame or greenhouse. When the seedlings are big enough to handle, prick them out into boxes or pot into small pots, using a compost similar to that which was first put into the seedpans. Place the boxes or pots in a closed frame which is slightly shaded from the sun. Air can be given in three or four days and eventually the frame lights can be removed altogether.

Your plants can now be planted out into permanent quarters as soon as they are big enough.

NB – The best time for sowing seed of alpines is in late autumn or early spring. Generally, no heat should be used, although some growers find a 'boost' of heat in the spring can help germination of some plants, such as Primulas, especially if they have been frozen during the winter.

Growing bulbs from seed

Henry Tod

It has been suggested to me that many members are put off from raising bulbs from seed by the supposed difficulty and time involved. Actually, bulb raising can be quite a simple process; the easiest method is to fill a small pot or pan, say 2 to 4 inches in diameter (a disposable cup with a drainage hole in the bottom is adequate for small amounts of seed) with 'John Innes No. 1 Compost', sow the seed thinly on the surface and cover it with really coarse sand. Raise the seedlings in the normal way but do not prick them out.

Prepare a square box an inch or so longer in the side than the diameter of the seed-pot, but at least 5 or 6 inches deep, making sure that there is a drainage hole or holes in the base. These holes are best covered with perforated zinc to prevent the entrance of worms or slugs. Put some crocks in the bottom, fill to within an inch or so off the top with an equal-parts mixture of 'John Innes No. 3 Potting Compost' and coarse sand. Make a hollow in this mixture of the same breadth, depth and shape as the contents of the seed-pot when the foliage of the seedlings

begins to die back later in the season. Invert the pot of seedlings on to the palm of one hand, lift off the pot with the other hand, turn the contents, i.e., the seedlings and compost right-side up and slip it into the prepared hole in the compost in the box. Firm it down gently, water it well and put it into the shadow of a north wall, hedge or shrub and leave it there. A pot several sizes larger and deeper, certainly at least 5 inches deep, could be used instead of a box, but clay pots present problems since: (a) they may crack with frost; (b) they tend to dry out too quickly; and (c) they are not so stable as a box. Plastic pots would get over difficulties (a) and (b) however.

All that need be done now is to make sure that it is permanently labelled and given a watering in very dry weather for the next one to three or four years. By this time the bulbs will have found their own level in the box or pot and will have developed far enough so that some will be coming into flower. In the autumn of that year, let the box and its contents nearly dry out, pass the contents through a quarter-inch riddle – and there you have your bulbs of planting size. Any that are too small can be either returned to the box or else grown on in a pot. It is advisable to keep the surface of the boxes weeded so that the young bulb plants do not have to compete for their food with strongly-growing weeds.

Longer hours in the garden

A new scheme devised by the Friends of St Andrews University Botanic Garden, which came into operation on 1 April, will enable the opening hours of the Garden to be extended.

The popularity of the Garden over the last few years, with increasing numbers of people asking to visit at weekends and in the evenings, has prompted the Friends to make the attractions of the Garden available to the public seven days a week from 10 am to 7 pm in summer and from 10 am to 4 pm in winter.

The Garden, which has been developed from a green field since 1960, has a wide range of interesting trees and shrubs and a particularly fine collection of alpine, rock and water plants (Fig. 57). It also contains a remarkable selection of Chinese alpines, previously lost to cultivation in Scotland, which the Curator of the Garden, Mr Bob Mitchell, brought back from an expedition to the Western Yunnan in China last year.

To help cover the additional cost of the scheme and, if possible, to improve the amenities of the Garden, a small entry charge will be made – 50p for adults; 25p for children. For those wishing to visit the Garden frequently, a season ticket (£3) will be available.

Thoughts on raising alpine plants from seed

JOHN AITKEN

ONCE embarked on a programme of growing and collecting alpine plants, the enthusiastic beginner will, sooner or later, want to try growing them from seed. It is probably the cheapest way of increasing stock and enlarging the collection; it is also the most frustrating and in some cases the most difficult. The seed of alpine plants, unlike that of annual bedding plants, will not necessarily germinate within a fortnight or so of sowing. In some cases, such as Cyclamen, germination will be spasmodic; some hard-coated seeds may take a year or more, others may not germinate at all.

In his book on Gentians, G. H. Berry points out that seed of *Gentiana verna* when sown in December germinated in the following March, while seed from the same batch sown in February in the same pan did not germinate until March in the following year. My own experience with *Cyclamen hederifolium* shows that seed sown any time between October and February never appear above ground until the following August or September, i.e., at the time the parent plant starts to produce its flowers. I am aware, however, that soaking the seed and maintaining the pans at higher temperatures may result in earlier germination. The effects of time of sowing and environment should never be underestimated.

Sources of supply

Most members of the SRGC will be aware of the Annual Seed Distribution Scheme. The seed list sent out in January may comprise up to 4,000 individual items, and from these members may make a limited selection. The list includes many plants rare in cultivation and seed of some species may be in short supply; it follows that requests for some species may not be met.

Seed may also be obtained from reliable nurseryman. In this case the cost will be greater. Another source of supply occasionally open to members are the various seed collecting expeditions to different parts of the world, when individuals or groups of individuals may be invited to subscribe to the cost of the expedition with shareholders sharing the spoils. Seed obtained in this way from plants growing in their native

habitats should show high germination rates and thus give the grower greater confidence of success.

The most accessible source of supply is, however, one's own garden. Here, on occasion, it is not even necessary to sow the seed as many plants will self-sow. A close scrutiny of favourite alpines should be made in the late summer or in spring when sometimes tiny seedlings will have appeared at the base of the parent plant. These may be lifted and potted on once they have reached at least the four-leaved stage of growth. Examples of the many plants often seeding themselves in this way are: *Lewisia*, *Aquilegia*, *Calceolaria biflora* and *Scabiosa alpina*. There are of course other plants which set quantities of viable seed but do not self-sow.

In such cases, seed should be collected as soon as the seed pod dehisces. Seed collected thus, if sown immediately, often gives high germination rates. A problem arises, however, in the case of the non-deciduous species in carrying the young plants through the winter, As a beginner, I frequently had trouble with *Calceolaria darwinii*; ripe brown seed or even less ripe green seed germinated like cress in a very short time. The seedlings grew well for the rest of the summer and early autumn but over-watering from October onwards resulted in their demise by the middle of February. I now find that withholding water altogether from mid-October to mid-February results in 100% survival. The problem with this type of plant can be tackled by simply delaying sowing until January but poorer germination may result.

Plant families which give best results when seed is sown immediately it is ripe include Gentianaceae, particularly the autumn flowering species; Ranunculaceae especially *Anemone and Pulsatilla*; Primulaceae including *Cyclamen* and *Androsace*; Compositae in particular *Celmisia*; Papaveraceae including *Meconopsis*. Individual species which also demand immediate sowing include *Calceolaria darwinii*, *Dicentra peregrina* and *Phyteuma (Physoplexis) comosum*. In this context I remember reading of one enthusiast who was fortunate enough to find self-sown seedlings of *Calceolaria darwinii*. Would that my plants obliged in the same way.

There are, of course, many alpine species the seed of which takes a long time to ripen. Often the seed acquires a hard outer coating and needs to be subjected to low or freezing night-time temperatures followed by high day-time temperatures, thus simulating the conditions prevailing in the natural habitat of the plant. This treatment causes the seed coat to split, allowing the entry of moisture into the seed, thus initiating the process of germination. It should be recognised, however, that not all seeds will respond to this treatment. Prolonged dormancy

may be influenced by biochemical and physiological processes which are not well understood. It may be that in some cases seed will have only a limited period of viability and if sown outwith this period will not germinate. Sometimes seed may be collected in the pod and may never ripen properly and in this condition may be distributed, albeit unwittingly. Light sensitivity may also be a factor.

Clearly, successful seed raising depends on a number of factors and a beginner should not be discouraged by lack of success. Sometimes failure may be due to factors outwith the control of the gardener and not to lack of expertise. The moral is be prepared for some disappointment but rejoice in success.

In preparing this article, I have read every account on the subject that has appeared in the Journal and in the bulletins of the AGS over the past thirty years. In addition, I have studied the methods of such authorities as Lawrence D. Hills, Royton Heath, T. C. Mansfield, G. H. Berry and many others. One thing is clear – none of them agree exactly on the composition of the ideal compost. Since most of these experts have had considerable success, it must be assumed that the actual composition of the compost is not all that important, provided the medium is free draining.

Composts

For the record and for what it is worth, the compost I use is a mixture of one-third each of loam, peat and gritty sand, with some added superphosphate. In this mixture both lime 'lovers' and lime 'haters' have to take their chance. The more specific needs of these two classes are catered for in the potting-on composts, when lime 'lovers' will receive additional loam with added ground tufa or limestone chips. Ericaceae and woodlanders receive a higher proportion of leaf-mould, when available, or peat.

In making up the mixtures, the use of sterilised soil is quite unnecessary. Sterilisation may kill all the weed seeds but it also kills all the soil bacteria as well as the mycorrhizal fungi, which are essential for the wellbeing of many of the Ericaeae for example. There seems little point in preparing a sterile medium which in a very short space of time is going to become reinfected, in many cases long before the precious seeds in the medium have germinated. The gardener should consider that it is not too difficult to recognise and pull out weeds as they appear in the pan. Fungal diseases, such as damping off, thrive where there is poor ventilation and high temperature and humidity. The remedy is to grow the seedlings under conditions where these dangers cannot arise. Where infection has occurred some control may be obtained by using Cheshunt compound according to the makers instructions.

Essential equipment

The three to six inch plastic seed pans make ideal containers but they do not last forever and they are becoming expensive. Readily available plastic margarine tubs cost nothing and do the job equally well. It is, of course, essential to perforate the bottom for drainage purposes. Several tubs may be perforated at one time, using a small electric soldering iron easily obtainable in any DIY shop. Other essentials are a length of plastic coated quarter-inch mesh sheeting, obtainable from any horticultural supplier, and a quantity of labels.

Sowing the seed

Once the compost has been prepared, a layer of broken crocks or stone chips should be put in the bottom of the pans. They are then filled to within half-inch of the top, the surface gently levelled and the seed sown evenly. Larger seeds may be covered with sifted compost to about their own depth. Smaller seeds need not be covered with compost but all pans should have a dressing of one-eighth to one-quarter inch grit. This serves initially to anchor the seeds, prevents evaporation from the surface of the pan and provides a suitable microclimate and some shelter for the tiny seedlings. Heavy raindrops falling on an undressed pan can do damage. The grit ensures that the drops disintegrate and the water is diffused uniformly over the surface of the pans. As each pan is sown it should be labelled with the name, date of sowing and origin of the seed. Finally, soak the pans in a tray of water, put them outside on a level surface and cover them with the plastic mesh sheet. A square yard of this material will cover thirty six-inch pans.

Seed sown in January or February will receive all the benefits of the worst frosts and snow which our winters can offer. As the weather becomes progressively warmer, some germination may take place. It is at this time that young seedlings are most vulnerable but the plastic mesh covering the pans now serves its most useful purpose since, in itself, it is sufficient to ward off the effects of late frosts. On the other hand, the mesh will shade the seedlings from unexpected spells of sunny weather which could dry them out. Germination of the different species will be spasmodic; some may take twelve months or more while others may not germinate at all. A few may respond to being taken into the more equable temperature of the alpine house or frame. When seed of a number of species has been sown it is my experience that a few at least will never appear. One is forced to the conclusion that in such cases the seed lacked viability in the first place. Hence the dictum that alpine seed should be sown fresh.

Growing and potting-on

Close inspection of the roots of any seedling will show that life literally 'hangs by a thread'. Even the most inexperienced grower will appreciate that such 'threads' are highly susceptible to moisture deprivation. It follows that they should never be allowed to dry out. Initially, root growth will be at the expense of growth above ground. The inclusion of phosphate in the compost will not only encourage root growth but, at a later stage in the development of the plant, the production of ripe seed or fruit. As the root and root hair system increases, a greater surface area comes into contact with the soil so that the young plants can more readily cope with short periods of neglect.

In general, potting-on should be done at the four-six leaf stage. The pot should be of a size which will comfortably take the root and allows for some additional growth. Some plants like the gentian may require deeper pots, as in this case the tiny rosettes may have roots up to six inches long. It is a mistake to over-pot. Most monocotyledons and cyclamen are best left undisturbed in the seed pans for the first year before pricking or planting out. After potting-on some seedlings such as *Rhododendron* and some of the more difficult species are best kept in a closed atmosphere for ten days or so to give them a chance to re-establish themselves; others, such as *Lewisia* will never look back.

Plant characteristics

The beginner should be aware that many alpine plants are deciduous. *Dodecatheons*, for example, will germinate freely. Very shortly afterwards the young leaves will turn yellow and die off. Some among the less experienced may be tempted to think that they have lost a whole pan of seedlings. They can rest assured, however, that the young growth will reappear in the following spring. I had one unfortunate experience. A gardening friend throught she was doing me a good turn when she decided to tidy up one of my seed frames, throwing out the contents of all pots showing no evidence of germination. Unwittingly, she also threw out my entire stock of *Lewisia stebbensii*, a plant which I have never been able to replace. Other deciduous species include *Incarvilleas*, *Glaucidium*, some *Primulas* such as *P. reidii*, *Lewisias* including *pygmaea*, *nevadensis*, *brachycalyx* and many other plants.

Many seedlings are prone to attack by aphids and slugs. *Calceolaria darwinii* attracts aphids in the same way as *Buddleia* attracts butterflies. Aphids are sometimes difficult to see, so that when making routine inspection a magnifying glass is a useful tool. Control is easily achieved by regular spraying with a suitable insecticide, particular attention

being paid to the under surfaces of the leaves. *Soldanellas*, *Phyteuma* and *Campanula* are susceptible to attack by slugs. Proprietary slug pellets are quite effective. A careful watch should be kept for tell-tale slug trails across the surface of the pan. Many a pan of seedlings has been saved simply by going out after dusk with a torch and removing the slugs by hand.

It will be seen that some knowledge of the characteristics of the plants one intends to grow from seed is essential if success is to be achieved. Over the years I have found the Journal to be a useful though not comprehensive source of information. I am sure that the Journal could be an even more valuable source of information during the next fifty years if a regular series of plant vignettes or plant cameos were initiated now. These could be based on the answers to the following questions:

Where does the plant come from?
What kind of soil and exposure does it demand in its native habitat?
Is it calcifuge?
Is it hardy?
To what extremes of temperature is it exposed?
What size does it attain at maturity?
Does it set seed in cultivation?
Would hand pollination help?
How long does the seed take to ripen?
What does the ripe seed look like?
Should seed be sown straight away or retained for spring sowing?
How long does the seed remain viable?
Is the plant deciduous?
Is it long-lived or should some seed be sown every year?
At what time of year does germination normally ocur?
How long from germination to flowering?
To which plant family does it belong?
Are the young plants prone to specific pests or diseases and if so, which?
Should it ever be allowed to dry out?
How can it be identified and separated from kindred species?
Is it possible for pan culture?
What is the best method of propagation?
When does it flower?
Does it resent root distrubance?
Would pruning at any stage be beneficial?

It is worth reflecting that six plant cameos per issue of the Journal over the next fifty years would result in adequate descriptions of 600 species. What a treasure-house for future generations of SRGC members.

Campanulas in the USSR

T. B. SHULKINA

AMONG the new species undergoing their first trials at the Leningrad Botanic Garden are a number of species of Campanula. It was in Great Britain that varieties of Campanula were first bred (Thomas Ware, Tottenham) and the widest range of varieties was raised (Clifford Crook, *Campanulas*, 1951).

Of the 150 species of Campanula mentioned in the *Flora of the USSR*, 86 are endemic. They are mainly concentrated in the Caucasus, but they are also found in the mountains of Central Asia, Siberia and the Far East. In the Caucasus, especially in the western part, species of Campanula are very varied and numerous. Here are the natural habitats of the very well-known *C. mirabilis* Albov. In this region there are also several other species which merit attention.

One of the very rare Campanulas, *C. hieracioides* Kolak., grows only in the gorge of the River Gega in the mountains above Sukhumi. When it flowers little pools of colour suddenly appear among the rocks. *C. hieracioides* is a perennial plant with elongated leafy stems which are slightly geniculate. At the time of flowering it reaches a height of 20–30 cm. The rather large dark blue flowers form a cluster at the top of the stem. It begins to flower in the first year after sowing, winters underground and is easily propagated from seeds and cuttings.

C. albovii Kolak. is also found in West Georgia in subalpine meadows. This Campanula, allied to *C. collina*, is distinguished from the latter firstly by its size – *C. albovii* at the time of flowering reaches a height of 50–70 cm – and secondly by its more branching, loosely-formed racemes and by its longer basal leaves.

In South Armenia is the ancient temple of Gekhard. All visitors to the temple, while admiring the austere style of its architecture, cannot help also being delighted by the splendid pale blue Campanula settled in clefts in the stones which form its walls. *C. choziatowskyi* Fom. is endemic to a small area of Transcaucasia. It is a perennial Campanula, flowering abundantly and for a long period and growing mainly on limestone. Its stems are pendulous, the branching racemes reaching 30 cm, and sometimes 60 cm, in length. Its flowers are rather large, deep azure blue and graceful. The corolla is tubular at the base with a pale blue stripe, while the calyx opens outwards, so that the flower resembles

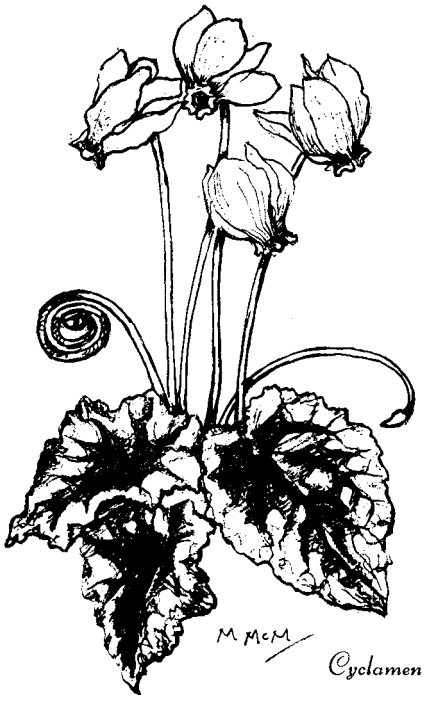
a cup and saucer. It is propagated from seeds and cuttings. It begins to flower in the second year after sowing.

C. komarovii Maleev grows on the northern part of the Caucasian coast in a locality between Gelendzhik and Novorossiysk. It is a biennial plant, developing a rosette of leaves in the first year. The tall (up to 50–70 cm) branched stem appears in Leningrad in June. It flowers abundantly for about three weeks with occasional flowers appearing for a further month. The flowers are very large, up to 4–5 cm in length, the corolla being bright violet-blue. This wild plant can compete in beauty with many garden plants.

C. turczaninovii Fed. is a representative of the tundra zone of the Siberian mountains and is also found in North Mongolia. It is a perennial with its leaves clustered in a rosette. The flower-bearing stem reaches a height of 10–20 cm, seldom more. The flowers number 2-5 and are located at the top of the stem. The corolla, in the shape of a narrow funnel, is up to 4 cm long and deep blue. It flowers in June in the second year after sowing.

All these plants have undergone trials in Leningrad where the climate is close to that of the northern regions of Great Britain, therefore one can confidently predict their successful cultivation.

Work with ornamental plants of the flora of the Soviet Union continues and we shall be glad to present it to you in the future.



Cyclamen hederifolium

Crocus scharojanii in the garden

RUDI SCHLAMM

THE yellow autumn-flowering *Crocus scharojannii* is a species of crocus which is seldom cultivated. It is often mentioned in literature, but rarely described fully. Opinions about conditions for growth differ greatly.

Its natural home is in the Caucasus mountains. According to older literary sources, it is also to be found in Armenia, Anatolia and Iran. Zachkadsor describes its appearance in Armenia: I myself have never found it there, quite possibly because of the timing of my visits. I have only ever found *Crocus vallicola*, which is also more commonly found in Anatolia than *Crocus scharojanii*. *Crocus scharojanii* is found more frequently in the Caucasus mountains than elsewhere. I found most of the plants in the Baksan Valley in the Elburz, on Mount Tscheget. It grows here between the heights of 2,500 and 3,000 m. Much below 2,000 m it was not to be found. It also grows at the same height at Teberda and in the Dombai Valley, often along with *Crocus vallicola*. I am told by friends that *Crocus scharojanii* grows in the same conditions in the region of Kasbegi. I myself have not found it there either. The best time to see it is during the flowering season, or at least just after the thaw – at the end of June, beginning of July when its square leaves appear. In cultivation, its foliage develops several weeks earlier, according to the time of the thaw. Since this crocus only grows on sloping mountain swards which are used as grazing land, it is not always easy to find outside its flowering period.

Its habitat is always fairly damp, although not wet enough to cause water to accumulate. The ground is porous, acidic humus, consisting of Carex and various grasses. The bulbs lie at a depth of about 5 cm to a maximum of 8 cm. Although the whole area is well drained, there should always be a certain degree of moisture. I never found bulbs wedged in between stones: this crocus seems to need to be free from restrictions in order to thrive. The bulb should not be left to dry, in contrast to other sorts of crocus. Special attention should be paid to this if they are being grown in the garden or in a pot. Corms seldom multiply in cultivation. However, it is not difficult to grow from seed, if evenly sown. I found considerably more seedlings than corms on site. None of my cultivated plants has produced a new bulb in ten years, although all

the plants bloom and always produce seeds. Bulbs which produce seeds do not normally bloom that year. The cycle runs roughly as follows: from the end of April, three to four square leaves appear, about 10 cm to 12 cm long and 3 cm thick. In contrast to *Crocus vallicola* which normally has square leaves, *Crocus scharojanii* is more rectangular with one side slightly longer than the other. Bulbs must have at least three leaves in order to bloom. Bulbs with two leaves have never bloomed in my experience. About the end of June, the beginning of July the leaves wither; this is rather later in cool and damp summers. At the end of July, often even by 15 July, the long slender-stemmed, butter-coloured blooms appear. They have five easily visible longitudinal veins. A prominent tip develops on every petal as it withers. When it opens out the pistils and petals are the same length; the pistil then grows with a three-columned stigma to about 1 cm longer than the stamens. The latter are ripe about a day earlier. The blooms are pollinated by all kinds of insects. In their natural environment this is mainly done by syrphids and sawflies. The flowers last for up to a fortnight in cool weather, provided that they have not been pollinated. They are especially eyecatching in the garden, as no other autumn crocus blooms so early, and since yellow flowering bulbs are rare at this time of year.

I have been growing *Crocus scharojanii* for more than ten years outside as well as in pots. After the initial difficulties, there have been no more problems. Failures have only occurred as the result of being eaten by mice or insects. I would like to give the following instructions for its cultivation outside or in pots:

1. Good drainage in ground where planted, or in pots.
2. Compost: 2 gravel; 2 peat; 1 turf; 1 humus.
3. Depth outside: *ca.* 5 cm
   Depth in pot: *ca.* 3–4 cm
4. Site may be in full sunlight if it is kept damp enough.
5. In areas with severe frost, extra protection should be afforded. In my garden, *ca.* 600 m above sea level, with sufficient snow covering, no winter protection is necessary.
6. I have no experience with manure, as my ground is natural meadowland. It is to be expected that it responds to the use of fertiliser. In its natural habitat fertility is maintained naturally by grazing sheep and cattle.
7. It is not sensitive to lime, and grows equally well with or without the addition of this.
8. Care must be taken that the soil does not become too dry. However, it will not tolerate accumulated water.

North-east Turkey

MICHAEL and LYNN ALMOND

Part One

AS WE carefully negotiated the water-filled pot-holes in the road out of Trabzon, the rain was falling in a steady drizzle and the mountains to the south were shrouded in low cloud. Behind us lay the grey, leaden waters of the Black Sea and the fabled Towers of Trebizond; ahead lay the ancient caravan route up and over the Zigana Pass and on to Erzurum and Iran (Figure 60). The northern slopes of the Pontic Alps, facing the Black Sea and the moist winds blowing off it, are perennially wet and the climate of the south-eastern shore of the Black Sea has been variously described as temperate rain forest or 'like living in a salad'.

A little above the village of Hamsiköy (about 1,600m) we braved the swirling clouds and the sodden undergrowth for a brief foray from the security of our car. The steep hillside above the road was covered with hundreds of yellow lilies (*Lilium ponticum*) and we also found *Aquilegia*, a large yellow *Pedicularis*, marsh orchids and masses of primrose leaves. A little higher up, under the pine woods, there was a great deal of *Azalea pontica* and *Rhododendron ponticum*, but by now (the first week in July) most of it had finished flowering. In places there was a carpet of wild thyme and numbers of leaves of colchicum and *Cyclamen coum* (*ssp. caucasicum*?).

We were not too disheartened by the fact that from the coast at Trabzon up to just under the Zigana Pass we had travelled through continuous cloud and rain and been able to see very little. We had been told what a marvellous hunting ground for the botanist the pass itself was and we had read how the rain-laden clouds of the seaward slopes gave way suddenly and almost miraculously at the very summit of the pass to clear vistas of the mountains of eastern Anatolia. Alas, in our case the miracle was not wrought. After a brief but hopeless foray up the slopes above the road, during which we failed to encounter a single flower, we retreated beaten and besodden to the car and continued our journey down the south side of the Zigana Pass, never (because of the inevitable tightness of schedule in a three-week holiday) to return.

So much for the Zigana Pass. The rain gradually eased and the visibility improved as we lost altitude. The weather did not clear until

much later in the day, however, and the banks of cloud over the high mountains suggested that the weather at the top of the pass could not have cleared for about thirty-six hours at least. Later we were told that the weather had been particularly bad in the mountains for the time of year, so perhaps others will be luckier than we were. The weather was still wet as we climbed the west side of the Vavuk Pass (1,900m), between Gümüşhane and Bayburt, and we stopped only on one or two occasions to explore the soft, clayey hillsides. We did find an attractive creeping convolvulus with large pink and white flowers, together with a very hairy onosma, an allium and a compact, magenta bladder-campion.

We reached the top of the Vavuk Pass and looked down into the valley of the river Çoruh, whose valley we were to follow for the whole length of its course from the upland meadows to the west of Bayburt (at about 1,700m) to Borçka (at about 150m above sea level), near where the river flows into the Soviet Union for its last few miles to the Black Sea. The clouds now began to roll back and the valley, flanked by limestone cliffs and dotted with the villages of the hardy Anatolian peasants, lay stretched out in the sun before us.

After spending the night at Bayburt we left the Çoruh valley the next morning for a trip up to the Soğanlı Pass (2,370m), on the road from Bayburt to Of on the Black Sea coast. The Soğanlı Pass is a saddle of undulating pastureland between hillsides rising steeply but not precipitously on each side. It contrasts sharply with the grandeur of the Dağbaşı Pass (see below). There are occasional outcrops of rock and around these the flora was most interesting, although there were also flowers elsewhere. The whole area was fairly well grazed.

In the short turf on the slopes to the west of the road we found two different species of campanula: one, a fine deep lilac in colour and growing on a small outcrop of rock, was probably *C. tridentata*; the other, growing in considerable numbers scattered over the turf, a lighter lilac in colour and varying in form from prostrate to almost upright on a stem about three inches long, we have been unable to identify. There are ninety-five species of *Campanula* listed in the Flora of Turkey and there is no certainty that this is even one of them. On the open hillside we also found *Cyclamen parviflorum* leaves, *Erigeron, Scilla, Gentiana pyrenaica, Ornithogalum balansae, Gagea fistulosa*, a purple *Geranium, Putoria* (or *Asperula*?) and masses of beautiful pale-primrose *Daphne glomerata* (Fig. 63) growing huddled around the rocks. On the eastern side of the road we found much of the same, together with *Corydalis conorhiza, Potentilla, Muscari aucheri, Pedicularis, Draba polytricha, Viola altaica* and leaves of a dwarf and prostrate *Berberis*.

Eventually we reached Ispir, the ancient capital of the Bagratid princes

of western Georgia, now a sleepy market town of a couple of thousand or so inhabitants, nestling in the bottom of the gorge of the Çoruh in the shadow of its ancient citadel. After choosing to stay in what seemed from the outside the most promising of the few small hotels, we explored the town, including the citadel with its ruins of the palace-fortress of the Bagratidae and its venerable Selçuk mosque. In the narrow street below the citadel we stumbled on a real Aladdin's Cave of hardware: sickles, ploughshares, cowbells, sheepbells and other implements which we probably could not have recognised even if there had been enough light inside the shop to see them all properly – all hanging from the walls and ceiling of a small cavernous room lit only by the open doorway. After exchanging pleasantries with the owner and his two companions (who were, no doubt, as fascinated by us as we were by them and their surroundings) we purchased two handsome cowbells, for the princely sum of forty pence each, and went on our way.

Next morning we again left the Çoruh valley to drive up the road towards Rize (on the Black Sea coast) as far as the Dağbaşı Pass (2,750m). The road is well made but extremely rough in places. We stopped along the way to admire the mountain scenery and the flowers. On some cliffs overhanging the road we found large clumps of a *Campanula* with large, delicate flowers; some clumps had white flowers and others a delicate rose-pink. We found a rich variety of campanulas in north-east Turkey and had great difficulty in identifying them. These were probably *C. betulifolia*, but we found other white campanulas in other places, varying considerably in habit and shape of flower and the best we can say of them is that they all are probably variants of this same species. The shape of the flowers varied from the small, tight bells of those on the cliffs of Bayburt Kale to the large, wide-spreading bells of those on the church of Barhal (see below). The ones we found on our way up to the Dağbaşı Pass were intermediate between the two extremes: they had fairly large flowers with beautifully formed bells, but not quite so wide-spreading as those at Barhal (Fig. 64). To my eye these were the finest of the forms we found, particularly in view of the delicate pink colour of many of the flowers. In the meadows alongside the road there were also marsh orchids and other meadow flowers.

The Dağbaşı Pass is scenically much more striking than the Soğanlı Pass. It is approached from the south-east by way of a long, curving, rocky valley flanked at the lower end by the wooden, chalet-like houses of mountain villages and at the upper end, virtually up to the pass itself, by the dry-stone, turf-roofed bothies of the families who pasture their flocks and herds up on the mountains in the summer months. There are massive cliffs and screes at each side of the pass and, also in sharp contrast

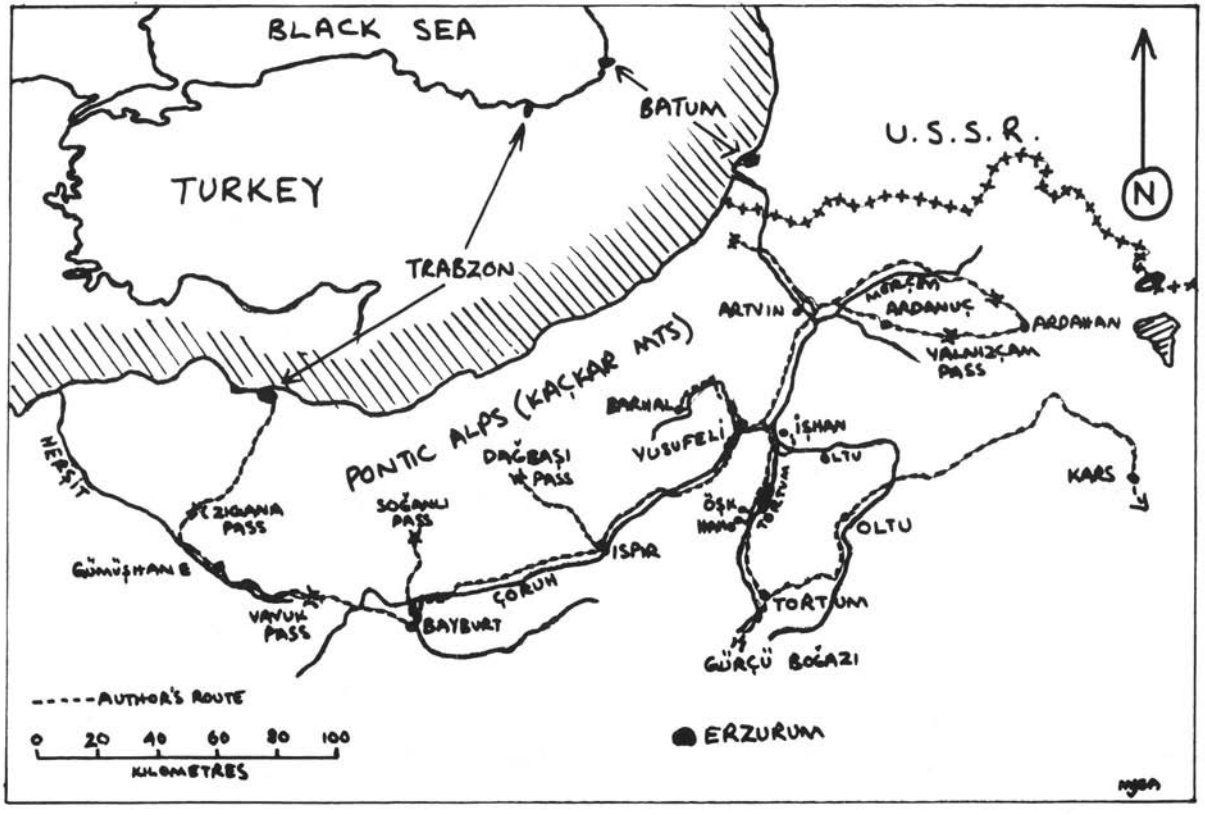


Fig. 60 Map of North-east Turkey (see page 274)

Fig. 61 *Primula longipes* (see page 277) Photo: Michael Almond

Fig. 62 *Fritillaria rhinopetalum bucharica* (see page 290) Photo: Ron Bezzant

Fig. 63 *Daphne glomerata* (see page 275) Photo: Lynn Almond

Fig. 64 *Campanula betulifolia* (see page 276) Photo: Michael Almond

to the Soğanlı Pass, innumerable mountain streams issuing from the snow which in July still covers much of the upper slopes. In places the streams spill over their banks to create broad tracts of marshland; and there are also one or two small tarns. As alpine scenery goes, the Dağbaşı Pass can hold its own in any comparison you may care to make.

The western slopes above the pass, which we spent some time exploring, were a treasure-house of interest, colour and beauty and, as ever, we only wished we had the time to explore further. There were various species of *Primula* in abundance – carpeting many of the very wet places and forming a ribbon of pink along the sides of many of the streams: *P. algida*, similar to *P. farinosa, P. longipes* (a beautiful pink member of the *Nivalid* section) (Fig. 61), what we decided must be a natural hybrid between *P. algida* and *P. longipes*, another unidentified primula with fine purple flowers* and (just gone over) *P. auriculata* (?). On the slopes below the melting snow (and probably until recently covered by it) were a considerable number of *Fritillaria latifolia var. nobilis* (Fig. 58) dotted over the rocky hillside singly or in small groups. We also saw *Campanula tridentata* similar to those on the Soğanlı Pass but darker in colour; on the cliffs *Draba polytricha* formed bright yellow clumps and on one rocky outcrop we found a small bush of *Rhododendron caucasicum* displaying its large white flowers: it did not seem entirely at home in this alpine setting and had probably strayed from its more usual habitat on the northern slopes of the mountains.

(To be continued)

* Since identified as *P. elatior ssp. meyerri*.

Primula farinosa

Cyclamen repandum

MURIEL G. HODGMAN

CYCLAMEN repandum is distributed widely around the central and eastern Mediterranean region. It may be found in Greece, Yugoslavia and Italy, in the south-east corner of France (very rare), and on the islands of Sicily, Sardinia and Corsica.

My first sighting of it was on a mid-April journey south towards Sparta in the Peloponnese. We, my travelling companion and I, had stopped our hired Volkswagen 'beetle' at a good parking place to investigate the puffs of beautiful powder blue dispersed among the typical dwarf – and *very* prickly – shrubs of the Macchia (maquis) which covered acre upon acre of the stony, limestone hillsides.

The blue turned out to be the countless flower-balls of the shrubby *Globularia alypum*, but by far the greater thrill was seeing the cyclamen for the first time, and most plant hunters will admit, I think, that first findings produce the most indelible memories.

The plants were usually growing under bushes where there would be some protection from the ravages of the inevitable herds of goats. Often they had established themselves against large stones or small boulders, and the tubers were always deeply buried.

The leaves, beautifully shaped and marbled, but thin textured, were everywhere shaded from the full power of the sun.

Much photographic film was used here "in case we wouldn't see cyclamen again", and needless to say quite unnecessarily because they are widespread throughout their range and often abundant. The most beautifully poised plant I have ever seen was found later growing in 'terra-rossa' in a rock crevice at a luckily chosen lunch spot along a narrow track off the main road to the west, nearing Kalamata.

The small, elegant flowers of *C. repandum* may vary from very pale pink to deep rose with a rich crimson nose (except in the very rare pure albino form). Since the greatest variation in the shades of colour occurs in Peloponnesian plants, and the least in the glowing reds of Corsica and Italy, and in the white Rhodes variety named *C. repandum rhodense*, the suggestion has been offered that the Greek plants may represent intermediates between the east and west types.

The leaf-patterns are variable too, some showing most attractive marbling, others none at all; indeed these may be seen growing side by side.

The white flecking is said to be a characteristic of plants of the Peloponnese. A very fine collected specimen showing this speckling has been named C. *repandum* 'Pelops' (since vegetative propagation is not practicable and seed will give rise to variable progeny, the name 'Pelops' appears destined to die with the plant), and was given an Award of Merit when exhibited in perfect condition in London on 9 April 1968.

In the wild I have seen flecked plants growing with plain-leaved plants, and, to add confusion, on one occasion both were flourishing alongside a group of flowerless plants with almost every leaf-shape imaginable, from deeply jagged to perfectly round – which probably were *C. hederifolium* variants.

The distribution range and the observed habitats are good indicators of cultural needs. *C. repandum* can be grown successfully out-of-doors in England only in the warmer, protected gardens of the south and south-west. That great plantsman, Mr E. B. Anderson, who grew them in his Porlock garden in Somerset, said he also knew of plants thriving at St Andrews and in other Scottish gardens. He suggested that hardiness might depend upon the provenance of original wild stocks. Seed collectors – please note!

Nature's choice of woodland or scrubland habitats coupled with the thinness of the leaf-blades clearly indicates the need to avoid exposure to full sun whether outside or in frame or alpine house, while the depth at which the tubers are found (about 12 inches: 30 cm) points to their need for cooler, moister summer conditions than some other species tolerate, and certainly to a dislike of baking. The deepest possible root run should be the aim, with good drainage.

Propagation is by seed sown as soon as ripe and preferably straight from the capsule before any drying of the mucilaginous seeds has taken place. This will ensure a high percentage germination.

At the turn of the century and before strains of the florists' pot-grown *Cyclamen persicum* had become stable, nurserymen were advised that they might try increasing selected plants by dividing tubers into sections each with an 'eye', as one can potatoes. This is *not* for *Cyclamen repandum*!

Conservation of garden plants by committee

HENRY TAYLOR

A RECENTLY formed committee suggests assembling all the species and garden varieties of each genus into national collections, for example all the Hellebores at one site, all the Hebes at another.

Now, all I have to do is persuade this august committee to award a collection to me. Think of the glow of satisfaction when students beat a path to my door to study these plants in the vain hope of conclusively defining the differences between species. But maybe I would be better advised to leave the collection in the committee room. There could be one or two hazards with the scheme, such as plants dying off.

My site would inevitably spell doom for those plants which only flourish in a different locality in the far north, south or west. Again, think if I were awarded a collection of old Primula varieties, my garden would collect a nice selection of virus diseases because with some old plants the only clones available are diseased. Mass the unhealthy together with any clean stock and conditions should be ideal for infecting the lot with disease. Perhaps such a collection could also aid the spread of root aphis and vine weevil. But of course I would spray against these pests and would certainly get useful information on which insecticides kill which varieties, that is if I avoided the problem of an accidental overdose killing the lot. Think of the devastation if a waft of herbicide blew over the hedge from a neighbour or if there was a sudden severe frost. Would the committee provide an electric fence to avoid plants being spirited away? Who provides the cash for fence, fertiliser and insecticide? While on the subject of Primulas, I remember a lovely Juliae Polyanthus that I once owned and contrived to lose. On second thoughts, the committee would be foolish to entrust me with the responsibility of any collection.

Anyway, I could easily persuade myself that I would not want the plants as many old varieties are just old rubbish undeserving of perpetuation. Though the number of species in a genus is limited, there is no finite limit to the number of garden varieties bred in the past and in the future. Either it will require a curator with infinite space in his garden or a committee member will have to choose which plants to grow and which to exclude. The collection then ceases to be comprehensive

and valuable because conservation is exactly the perpetuation of old rubbish which nobody would deliberately choose.

The holder of a collection might try his hand at propagation but unfortunately committee bosses would have the final say on the distribution of any successful efforts. Recently published phrases include "Plants like arms shall be given to all men who offer an honest price for them without respect of persons or principles." Does this mean to any careless character sufficiently rich? Altogether a slightly mercenary approach in an age when at last some people are questioning the advisability of random arms sales.

Another recent statement concluded "The preferred avenue for distribution of plants will be the nursery trade." Rather impractical as any overworked nurseryman knows that he has little enough time to propagate easy plants. The professional trade journals advise dropping difficult plants and concentrating on popular easily propagated lines for maximum profit. Where have the committee members been hiding in the last few years? If they had practical experience of growing rare plants they would be aware that the rarest are swapped around by enthusiasts in our club and other such clubs, enthusiasts who look for a good home for their propagations. Our club is growing in numbers, and the cultivation of rare plants is flourishing as never before, as witness the length of our seed distribution list. There is the sensible way to conserve garden plants, swap them around and scatter them throughout the world, do not concentrate them in one spot.

Does the garden plant conservation committee deserve support? Certainly it would be worthy of reconsideration on the day after the committee room has been used as a laboratory for raising a few thousand *Cypripedium calceolus* from seed and the seedlings have been sold at an honest price.

Book reviews

The Crocus by BRIAN MATHEW
B. T. Batsford Ltd. 255pp. £25 (1982)

To most gardeners it will come as a surprise that there are well over 70 species of *Crocus*, let alone all the many named varieties. To produce a monograph of the genus, acceptable to both botanists and gardeners is a mammoth task which Brian Mathew has achieved brilliantly in his new book on the genus.

Starting from a botanical account of the *Crocus*, its genetics and geographical distribution the author goes on to a classification and key followed by a description of each individual species and, in many cases, sub-species. There is an excellent index and a good list of synonyms which is invaluable in a genus with so many spurious names floating around.

Every species is accompanied by a full-page colour illustration giving a great amount of detailed information. All are of considerable beauty, either based on 19th-century illustrations, plates from *Curtis Botanical Magazine* or specially commissioned for this book.

This is likely to remain the definitive book for enthusiastic bulb growers for many years to come and should be in the library of all bulb enthusiasts.

The book is beautifully produced with readable type and laid out in a clear and straightforward way. A.D.M.

The Rhododendron Species Vol. 1. *Lepidotes* by H. H. DAVIDIAN
B. T. Batsford Ltd. 430pp. £35 (1982)

Every so often one comes across a book which is destined to become a reference book in the author's lifetime and which is obviously his life's work. This book belongs in this category.

For gardeners interested in identifying lepidote *Rhododendrons* this book will be invaluable. The easily worked keys should enable any competent gardener with a smattering of botany to identify most of the lepidote *Rhododendrons* in their garden. The diagrams of leaf and flower shapes are of great assistance.

The book is well illustrated with excellent line drawings; the 95 colour plates are of great interest and will help in identification but the quality of the colour separation is far from ideal with many of the prints showing an overall tendency to redness.

The book adheres to the old classification system of Isaac Bayley Balfour's 'The Species of *Rhododendron*'. The author states quite categorically that the recent revisions of Sleumer, Cullen, Chamberlain and Philipson are not acceptable and will not be recognised. This is a pity in view of the acceptance by the Royal Horticultural Society of the new classification.

However, in spite of this major limitation this book will be invaluable to gardeners as a comprehensive guide to identification, history and cultivation of lepidote *Rhododendrons*. R.J.S.

Growing Cyclamen by GAY NIGHTINGALE
Croom Helm Ltd. 148pp. £7.95 hardback (1982).

A good modern text on the genus *Cyclamen*, from the gardener's point of view, has long been awaited, and sadly still remains so. The present volume is a hope largely unfulfilled.

Really remarkably little of the text is taken up with the problems and techniques of growing *Cyclamen*. Only passing mention is made of the use of plastic pots, and certainly no help is afforded in their use or in the modification of the potting composts required with plastic pots.

Many pages are taken up listing *Cyclamen* cultivars, on diary pages, on a chapter on 'Where to Grow *Cyclamen*', which talks a lot about plant associations, and another chapter on '*Cyclamen* and the Artist'. None of these are particularly relevant to cultivation.

There are some 30 line drawings of various species *Cyclamen* in the text. In general, the flower outlines are clear and helpful in the identification of the species. The same cannot always be said of the drawings of the leaves. The outlines of the pedicels and petioles are generally not executed with the decisiveness that one would expect of an accomplished draughtsman.

The colour plates in the copy under review do not reach the standard that we have come to expect in recent times. This appears to be partly due to bad printing technique, but is, I suspect, in part due to the original photographs not having been of adequate quality.

The perspective of the pictures often gives a poor impression of the form of the flowers. The flower of *C. rohlfsianum* is flawed and should not have been subjected to the scrutiny of a head and shoulders shot.

The technical drawings ignore the rules of perspective and sit awkwardly on their respective pages. The map of the distribution of the species is of interest, but is spoilt by the poor quality of the lettering and numbering of the habitats.

The proof-reading appears to have been done carelessly, there being no less than 9 obvious errors in the text, the worst being the use of 'sort' instead of 'sought'.

Under the heading of Societies in the appendix of 'Useful Addresses', the SRGC is a notable omission.

Finally, the index could have been easier to use, had it been better laid out. The allocation of separate lines to the individual *Cyclamen* species is surely not too much to ask. T.G.S.

Between Two Gardens by SYLVIA MARY McCOSH
Titus Wilson & Son Ltd., Kendal, Cumbria. 101pp. £5.95 (1982)

Dalemain at Penrith and Huntfield at Biggar are the two Border gardens which form the subject matter of this book. Sylvia Mary McCosh runs these two gardens which are some 100 miles apart. The book takes the form of a diary for the year 1980 prefaced by a prologue which sets the scene, taking account of the history of the Gardens, their geography and climate, and the development of the author's interest in gardening.

The diary is a day by day account of running these two sizeable gardens with very little help outside of the immediate family. A reference by the author to pricking out seedlings probably puts the rather daunting task into perspective, "collected about forty fish boxes from Jean Paul's shop for seedlings to be

pricked out into later on". It is basically a garden diary recording happenings between Monday 17 December 1979 and Saturday 3 January 1981 inclusive. Three days are spent in one home and four in the other every week of the year caring for the gardens and opening them to the public.

The book makes interesting and enjoyable reading. It is helpful to have an up-to-date and reasonably comprehensive account on the health of plants which have been subjected to the rigours of our, at times, rather inhospitable climate. I also enjoyed the little touches of garden folklore that creep in, and the odd trip down memory lane when for example the author refers to "*Daphne retusa* bought originally from a nursery in Barrhead", now sadly no more. That took me right back to my own introduction into the rock gardening world. Eccentricity is also referred to when she reflects on an occasion when she transported a large seedbox of *Erinus alpinus* seedlings on the train from Dalemain to Huntfield because the job of potting up was not completed. Surely this is not eccentricity but the hallmark of true dedication without which Huntfield and Dalemain would not be what they are today and she would not have satisfied the responsibility she placed upon herself when Dalemain passed to her safe-keeping upon her father's death. "To love and cherish, and to continue to try and protect this great heritage and to hand it on to the next generation in a better state, if possible, than it has been passed on to me." M.G.A.

Royal Botanic Gardens Kew – Gardens for Science and Pleasure
Edited by J. Nigel Hepper. HMSO, London. £10 (1982)

It would be impossible in a book of 190 pages to give an exhaustive review of Kew Gardens including its history, research and allied activities. However, the 20 essays which comprise this book give a broad view of the Gardens and of the horticultural and scientific work in progress.

It is written for the non-specialist to the extent that English names are used along with Latin names wherever possible. Thankfully, no attempt has been made to produce English names where none exist. The index of plant names is comprehensive with splendid cross-referencing.

The section on the rock garden and alpine house written by Brian Halliwell is necessarily brief but gives names of enough exciting plants to whet the appetite and to put the alpine house high on everyone's list of essential places to visit.

The book is beautifully produced with excellent clear type on a good quality art paper. The hundreds of colour photographs can not be faulted. Colour reproduction is very true, although if the brilliant red form of *Phlox mesolenca* is as bright as it is portrayed, the plant must be quite outstanding.

This is a book for browsing through. It will revive pleasant memories for those who know Kew; for those who don't it will surely be a spur for an early visit. M.S.R.

Discussion weekend September 1983

Dunfermline College of Physical Education, Cramond, Edinburgh
Thursday 8 September – Sunday 11 September

Programme

Thursday 8 Sept	3–5pm	Register
	6.00	Sherry
	7.00	Dinner
	8.30	Film
Friday 9 Sept	8–8.30am	Breakfast
	9.15	Welcome by the President
	9.30	W. C. Buchanan Lecture – Mr Alfred Evans 'The Cultivation of Peat Loving Plants'
	10.45	Coffee
	11.15	'Early Spring Plants of the Mediterranean' – Dr Tom Norman
	12.15	*Joint Rock Garden Plant Committee*
	1pm	Lunch
	1–4pm	*Show Open*
	3.30	Tea
	4.00	'The European Alps' – Mr Jim Jermyn
	7.30	*Jubilee Buffet Reception* at The RBG – transport provided
Saturday 10 Sept	8–8.30am	Breakfast
	9.30	Visit to The RBG
	1pm	Lunch
	2.30	'Cyclamen Cultivation' – Mrs Kathleen Dryden
	3.45	Tea
	4.15	'Plants of the Balkans' – Mr Zdenek Zvolanek
	6.30	Dinner
	7.45	'Any Questions' – with Panel of Experts
	9.30	Auction
Sunday 11 Sept	9am	Breakfast
	9.45	'The Lily Family – Dr Brian Mathew
	11am	Coffee
	11.15	The Esslemont Lecture – 'Dr Brinsley Burbidge 'Just Below the Snow Line, Hunting for the World's Highest Plants'
	1pm	Lunch
	2.30	'Arctic Flora' – Dr R. Corner
	3.45	Close of proceedings
	4.00	Tea and disperse

Accommodation will be single student-type bed-sitters. The college, pleasantly situated at Cramond on the north-west of Edinburgh, stands in its own grounds and has good facilities, including an indoor swimming pool. It is easily accessible from the Queensferry Road, either by way of Whitehouse Road (running north from the Barnton Roundabout), thence into Cramond Road North, or by way of Quality Street, thence into Cramond Road North.

The Autumn Show will be held in conjunction with the Conference, details of which are in the Show Schedule. A meeting of the RHS Joint Rock Garden Committee will be held at 12 noon on the Saturday of the Show.

Donations of plants, books, etc., will be much appreciated for the 'Bring and Buy' Stall.

Charges, including VAT at 15% and Conference Fee:

Full Board from Thursday dinner until Monday morning	£76.00
Full Board from Thursday dinner until Sunday tea	£64.00
Full Board from Friday Morning until Sunday tea	£51.50

Day charges

Friday: coffee, lunch, tea, buffet	£15.00
Saturday: lunch, tea, dinner	£12.50
Sunday: coffee, lunch, tea	£9.00

All bookings, residential and day, must be received by Friday 19 August 1983. Applications, together with the remittance (payable to K. Truman) should be sent to: Mrs K. Truman, 36 Ladysmith Road, Edinburgh EH9 3EU (031-667 8867).

JANUARY 1984 ISSUE

Members wishing to submit material for the January 1984 issue of 'The Rock Garden' are asked to let the editor have it by the beginning of November 1983 at the latest.

Seed Exchange

JOYCE HALLEY

OUR THANKS are due to the growing band of seed donors and the willing workers of the Angus group, all of whom make the exchange possible.

The curtailed surplus seed allowance was a success, we were not harassed as we were last season, and as far as I know the only really disappointed members were one or two who sent in orders too late. Inevitably there is seed left over and this goes to show secretaries for sale at shows. The first show is about the end of March, time is required to name the packets, so we really mean the closing date in early March.

For 'new' seed collectors, I hope you have access to last year's June Journal, so that you can read Henry Taylor's article on collecting and cleaning seed, we need it ripe and clean. Please keep to our schedules and send me seed, or a list of seed to come, by the end of October. Our printers require the typed copy by mid November, so we have no time to linger.

All donors and overseas members will receive a seed list. Home members who wish a list and have not sent seed must send a s.a.e. or an addressed sticky label and stamp to:

Miss J. Halley,
16 Abercrombie Street,
Barnhill,
Dundee DD5 2NX.

There was the usual demand for Androsaces, Cyclamen, Gentians, Primulas, and the seed of small bulbs; a few seed of the rarer varieties from a few people can be distributed fairly widely. Please clean your seed and don't waste postage on rubbish. We have a leaflet on cleaning seed which is obtainable by sending me a s.a.e.

Many thanks for all the charming letters and cards received, they are much appreciated.

Here we have had a very cold spring, but I hope you have fared better and you all have a good gardening year.

Obituary **David Livingstone**

In the death of David Livingstone, the Club has lost one of its best known and respected members. David had been active in the Club since before World War 2 and held office longer than anyone else.

His interest in plants began as a child when he had access to a nursery in Carluke owned by his grandfather. At an early age he started showing Dahlias but was attending SRGC shows in Glasgow from 1938 until the war.

During the war he served in Iceland with the RAF and continued his interest in horticulture by tending the garden at his station. On his return he continued his job with the BBC with whom he worked for 32 years.

He quickly renewed his interest and activities in the Club. In 1947 he started writing for the Journal and continued doing so for 35 years. He also wrote for the Alpine Garden Society.

In 1948 he became Secretary and performed his duties with great drive and efficiency. The Club was growing very quickly under the leadership of David and Major Walmsley so it was soon obvious that a paid part-time Secretary was necessary and Sq. Ldr. Boyd-Harvey took over in 1951.

This was followed by Council membership till 1960 when he became a Vice-President and in 1970 he began his very successful term as President.

His interest in showing continued over the years and not only did he exhibit and win many prizes but acted frequently as a judge. He often attended shows in London while on BBC business and with his many friends in the AGS helped in the formation of the Joint Rock Garden Awards Committee with the Royal Horticultural Society. He was a member of this committee for over 20 years.

His love of alpine and rock plants took him with his family to many parts of Europe. Although his interests were widespread perhaps Primulas, both European and Asiatic, were his favourites and he was acknowledged as an authority on both. His love of the hills took him frequently to the Pentlands after his retirement.

His knowledge and interest were stimulated by his close friendship with Willie Buchanan of Bearsden and David Wilkie of the RBG, two of the Club's best plantsmen.

David was most generous. Being the true plantsman he believed that rare plants should be distributed as widely as possible. His knowledge he gave freely particularly to beginners and young people. In Council he was a strong forth-right speaker which was very necessary in the years after the war.

We will all miss his presence and friendship and we extend our deepest sympathy to his wife and daughter. R.S.M.

Show reports 1982/83

Autumn Show - Edinburgh 1982

The Autumn Show was held at the September weekend. It was rather poorly supported but there were nevertheless a number of well grown and interesting plants exhibited.

The Forrest Medal went to a fine *Cyclamen graecum* with 38 flowers shown by Mr A. R. Spensley of Richmond. The three pan class was won by Mr R. Johnston of Ryton with *Colchicum autumnale, Cyclamen purpurascens* and *Gentiana verna*. Mr D. Mowle, Lancaster, showed in this class the interesting yellow-flowered *Saxifraga flagellaris ssp. sikkimensis*.

Other noteworthy plants included a fascinating white-flowered orchid *Habenaria radiata* (Mr J. Crosland), the blue *Pratia pedunculata* (Mr B. Russ), a fine *Gentiana* 'Elisabeth' (Dr D Stead) and *Gentiana pyrenaica* (Mr F. Hunt).

The Joint Rock Garden Plant committee gave a FCC to the magnificent double white heather *Calluna* 'Kinlochruel' (Mr. F. Hunt) and an AM to the hybrid *Origanum* 'Kent' (Mr F. Tindall) and to *Gaultheria itoana* (Dr D. Graham) which is like a small edition of *G. cuneata*. D. C. GRAHAM

Stirling Show - 26 March 1983

At the Stirling Show many magnificent plants filled the benches bringing spring to those who saw them. The Forrest Medal and the Institute of Quarrying Quaich for the best non-European Plant in the show were awarded to a splendid 12" plant of *Dionysia aretiodes* from the Elburz mountains in Iran exhibited by Mr Eric Watson, who also showed *Primula rubra forma nivea* and a 12" pan of *Kelseya uniflora* with tiny strawberry flowers, which was awarded a certificate of cultural commendation by the Joint Rock Garden Plant Committee.

Dr Peter Semple was second with a slightly smaller *Dionysia aretioides, Androsace ciliata* and *Saxifraga oppositifolia*. Mr Jack Crosland was third with the electric blue *Corydalis ambigua* from Japan, *Scoliopus biglovii* from America and *Pleione humilis* Frank Kingdon Ward, a beautiful plant collected by Kingdon Ward in Burma. Another striking *Corydalis* was *C. solida* 'George Baker' from the RBG (Fig. 59).

The Ben Ledi Trophy for the Best European plant in the show and Mrs J. Stead's gift a piece of Worcester porcelain was awarded to Mr and Mrs H. Taylor's *Primula clusiana* 'Murray Lyon', a particularly large flowered clone. This plant came from General Murray Lyon's garden and was named after that great plantsman. Supporting *P. clusiana* in the three pan Primula class were two of their own seedlings, *Primula* 'Karen' (Linda Pope X allionii) and *Primula* 'Gowrie'. These seedlings are a credit to their raisers and we hope to see more of them in the future.

The Carnegie Dunfermline Trust Trophy for the most points in Section I went to Dr J. Cobb from Kingsbarns, among whose plants were three rarely seen Australian orchids all Petrostylis species, *P. nutans*, the nodding green hood, *P. curta*, the blunt green hood and *P. pendunculata*, the maroon hood. All three had soil hugging leaves from which arose the different hooded flowers. These rare, well grown, unusual plants caused much excitement. Dr Cobb also showed a pan of *Iris graeberiana* with 24 stems, which he can grow out of doors.

The Fife County Trophy for most plants in Section II was taken by Mr T. G. Sprunt who was also awarded the bronze medal. Among his entries were, *Fritillaria graeca*, a delightful plant with delicate maroon striped flowers complementing its dull grey leaves, *F. conica* with greener flowers and shiny green leaves, *Primula frondosa, Narcissus nanus* and *Androsace carnea alba*.

Mr Watson also exhibited (a) *Dionysia microphylla* GWH 1302 – pink flowers over tiny rosettes, which comes from Afghanistan and which according to the AGS book on the species is "not in cultivation"; (b) *Dionysia balsamea* GWH 580 also from Afghanistan, an upright growing species with broad oval hairy leaves up to 4 cm long and yellow flowers; (c) *Dionysia paradoxa* in Section III, which is very similar to *Dionysia balsamea*.

The latter two were both awarded Certificates of Cultural Commendation by the Joint Rock Committee as was Mr Watson's *Haastia pulvinaris*, Mr Wilf Kirby's *Nassauvia revoluta* and *Raoulia grandiflora* and Mr Malcolm Adair's *Arcterica nana*.

First in the class for plants grown from seed was Mr Ian Douglas's beautiful *Androsace vandellii*.

Excellent open ground plants were Mr R. Brown's immaculate *Sax. burseriana crenata* and *Anemone vernalis*, Mr Kirby's *Saxifraga X biasolettii 'Crystalie'* and Dr Evelyn Stevens' beautiful fresh *Sax. oppositifolia alba*. Other saxifrages in the show were Mr Kirby's 10" *S. 'Faldonside'* and *S. sempervivum*, Mr and Mrs Bezzant's *S. oppositifolia 'Ruth Draper'* a particularly large flowered form and Mrs Stead's *S. grisbachii* still in its tufa.

The classes for bulbs produced more interesting treats. Mr and Mrs Bezzant had a splendid white *Iris bucharica* and their *Fritillaria ruthenica* with reddish maroon flowers on 8" stems which they grew from seed. A magnificent well-flowered clump (over 35 flowers) of *Narcissus bulbocodium* was shown by David Martin. Second to this was Mr H. Esslemont's beautiful 8" pan of *N. watieri* from the high Atlas mountains.

Once again the Fritillarias were well represented *F. rhinopetalum bucharica* (Fig. 62) (Mr Watson), *F. aureus* (Mr Crosland), *F. carduchorum* (Mr Leven) and a large pan of *F. michailovskyi* (BSBE 1965) (Mr Esslemont).

A. J. LEVEN

Dwarf shrubs in the rock garden

FASHIONS come and go in rock gardens as in all kinds of gardening . . . Formal and informal gardens have vied with each other over the years with surprising regularity. The rock garden with massive boulders carefully built up on the Symons-Jeune principle has, at least for the present except in a few large public gardens, given way to the rock garden with the minimum of rocks. Similarly the bedding-out gardening which was so popular in the 1930s and which indeed lasted into the 1960s gave way to shrub gardens. This new style was supposed to be more labour-saving and to allow much more freedom of expression in gardening. As might have been suspected this new fashion has tended to produce stereotype designs whereby every new estate has its obligatory beds of heaths and heathers interspersed with dwarf conifers and surrounded by curved lawns and gravel paths.

The trouble with popularised types of gardening is that the number of different kinds of plants tends to decline and garden centres and nurseries deal in an ever-decreasing range of plants. The same easily produced species are imported in liners and the more interesting but difficult species are neglected. This reduction in the range of plants has applied to dwarf shrubs for the rock garden; plants which were freely obtainable a few years ago are now scarce. Rock garden literature has always abounded in dwarf shrubs but of late there has been something of a dearth of articles on this topic. Between 1953 and 1960 a series of eight articles in the SRGC Journal by Alfred Evans extolled the virtues of a huge range of dwarf shrubs (not including the Ericaceae). The omission of this family was more than compensated for by the same author when he wrote his book, 'The Peat Garden and its Plants'. Thankfully, there are now signs of renewed interest in dwarf shrubs and a number of specialist nurseries and garden centres, particularly in the north and west of Scotland, have begun to stock an expanding range of species.

Scotland has proved to be a most suitable place to grow shrubs which have their natural homes in the forest and mountainous areas of China, Tibet and Nepal as well as Pacific North-west America. The cool conditions of Scotland seem to suit these plants so much better than the south of England. A gratifying range of dwarf shrubs will grow in Scotland.

For those of us up in the cool north who cannot grow cushion plants because of the heavy rain or continual dampness, dwarf shrubs offer a wonderful alternative. The wide number of shrub species which can be grown to perfection are exemplified in gardens such as the Royal Botanic Gardens in Edinburgh, National Trust properties such as Branklyn in Perth as well as private gardens and a considerable number of nurseries.

It is perhaps invidious to choose just a few species out of the vast number of dwarf shrubs available for the rock or peat garden but there are a lot of absolutely superb plants which should be much more widely grown than they are.

Why are Cassiopes so rarely seen except in gardens of specialists? They are so easy to grow in Scotland and their nodding white bells in spring are a joy to behold. Long lived and easy to raise from cuttings they should be in every garden.

What about dwarf, or even not so dwarf, willows? The tiny white catkins of *Salix retusa* hugging the ground in February or the huge yellow catkins of *Salix lanata* in April are always worth waiting for. Andromedas, Phyllodoces and Pieris are all superb but too rarely seen. The vast range of heathers and of Rhododendrons are poorly represented in our gardens while dwarf Prunus, Sorbus, Amelanchier and Berberis are almost entirely absent. Even well known plants such as Acers and dwarf conifers are confined to a few species which are easy to propagate.

The best ways to find out what is available are to visit as many gardens as possible and then armed with a list or with Hilliers Manual of Trees and Shrubs in your pocket tour round some of the excellent Scottish nurseries which specialise in shrubs. The growing conditions under which they have been raised guarantee strong hardy plants which should do well in our gardens.

The next fifty years

HARLEY MILNE

WHAT OF the future? We are now in the age of jet travel where within a few hours of leaving home one can be tramping the alpine meadows and scree slopes of the European alps. A great change from the days of our founders when journeys of this nature took weeks or even months and herein lies the danger of indiscriminate collecting and the consequent spread and introduction of pests and diseases.

New fields are opening up as recent reports in our journals of trips to the more inaccessible parts of the Himalayas, the Andes, Yunnan and the visit to Sikkim this summer by members of the AGS. We look forward to hearing their tales, seeing their slides and sharing in their seed.

While these new areas are opening up to our members sadly other frontiers have closed as in the Middle East and Tibet.

Some innovations are here to stay. Plastics were heralded as a great boon to the gardener. Think of the nurserymen with thousands of pots and the saving in weight and ease of handling; but at most of the recent shows keen plants-people are still to be seen struggling in with back-breaking clay pots.

Plastic labels are not long lasting; they become brittle, writing fades and like all labels are adored by birds. Perhaps in the future something more permanent may be developed. May I make a plea to show secretaries – could some uniformity of labelling plants at shows be introduced? Some names are written from right to left, some from left to right and it takes the actions of a contortionist to read them.

The future of our Club is assured with an enthusiastic and industrious group of office-bearers, a healthy membership, well-attended shows with a very high standard of exhibits. I think our founder members would be proud when 50 years ago this summer our Club was founded "for the purpose of creating an interest in rock garden plants, to encourage their cultivation and to hold meetings and exhibitions for this purpose".

Let us not forget our aims as we go forward to our next 50 years strengthened by new friendships and the satisfaction of growing our rock garden plants.

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KASHMIR - a new pony trek
25 July to 15 August: £1,428, with Mr Oleg Polunin, MA, FLS

Our new pony trek takes us up into the high Sind and Suru valleys on the borders with Ladakh and is strongly recommended by Mr Polunin who pioneered it. We sleep under canvas in comfortable, well arranged camps and travel by day on sure-footed and docile ponies (each accompanied by its own pony boy) and sometimes on foot. Ascents have been carefully graduated in order that participants should accustom to the altitude, the highest point being the Kanital Glacier Camp at 13,000 feet. The trek starts and ends with a few days in houseboats on the Dal Lake in Srinagar. *We still have a few places available on this trek.*

ROMANIA - a country of colour and contrast
27 July to 10 August: £550, with Mr Dennis Woodland

The itinerary of this fascinating tour starts at Bucharest and then goes northward through the Carpathians, via the picturesque towns of Brasov, of Sighisoara (Dracula's city) and Tirgu Mures into Moldavia. Here, surely the highspot of the tour, there is an opportunity thoroughly to explore the 15th and 16th century churches and monasteries with their unique and brilliant exterior wall paintings. Mr Woodland is the Horticultural Adviser to Hilliers Nurseries and with him there will be a chance to enjoy not only the flowers of the green valleys and passes of the mountains but also those which grow profusely in every cottage garden.

SWEDISH LAPLAND - for Arctic flora
19 July to 1 August: £780, with Mr David Philcox, MSc, MIBiol

This one-centre holiday is spent in a comfortable hotel in the little settlement of Hemavan close both to the Norwegian border and the Arctic Circle. The dates have been carefully chosen, in consultation with local botanists and with Mr Philcox (who is a Principal Scientific Officer at Kew) to coincide with the short-lived and thrilling Arctic flora. We will be in good walking country and transport will be available for longer excursions.

PANZANO IN CHIANTI
8 to 18 October: £398 (escorted)

This delightful and relaxing one-centre holiday is spent in a converted farmhouse, the family home of an English lady. In lovely rolling country it is also within easy reach of Florence, Sienna and other centres to which excursions can be arranged. *For ten people only, sharing double rooms.*

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Whether you are looking for a large garden or a country house garden, such as **Leith Hall, Kennethmont, Aberdeenshire** or **Malleny, at Balerno, near Edinburgh,** the Trust can help. Our publication, 'Visitors Welcome' has a section devoted to gardens available to you, and we would be happy to send a copy on request.

Admission to all Trust properties, including gardens, is free of charge to Members, and details of how you can join the 110,000 who support us and help to preserve Scotland's heritage, will also be sent in response to your enquiry.

So do please ask for a copy of 'Visitors Welcome' and do come to see us. As we say, visitors are always very welcome.

We will be happy to send details of the gardens and other properties the Trust has available for you, if you would care to write to:

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