The Journal
OF
The Scottish Rock Garden Club

Editor—J. L. MOWAT, University Botanic Gardens, St. Andrews

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VOL. VII PART 3 No. 28—April 1961

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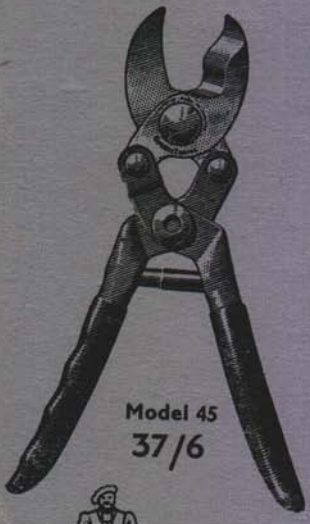

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The Journal

OF

The Scottish Rock Garden Club

Editor—J. L. MOWAT, University Botanic Gardens, St. Andrews.

Chief Contents

VOL. VII. PART 3 No. 28—April 1961

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Editor's Notes

LOOKING back to the last International Rock Garden Plant Conference held in 1951 it is not easy for those who attended it to realise that ten years have passed since then. For all who took part it proved a most enjoyable as well as interesting occasion and many new contacts and friendships were made which have lasted ever since. Now it is good to know that many of those friends and fellow-enthusiasts from various countries are very shortly to be with us again. We look forward to the renewal of their acquaintance and hope that they will again enjoy their visit to Britain and that the weather will be favourable throughout the Conference. We all deeply regret the absence of those of whom the intervening years have taken toll.

Among the notices following on these notes members will see one concerning a Discussion Weekend to be held at Kilmacolm early next October. These Weekends are becoming increasingly popular, and understandably so when one looks through their programmes. The one at Pitlochry last October proved itself an unqualified success in every way, setting up a new record for attendance, and is reported in detail at the end of this *Journal.* Kilmacolm should prove an equally acceptable venue and the programme arranged promises a wealth of enjoyable interest.

Certain county representatives are finding that for some reason, or perhaps a variety of reasons, attendances at their winter meetings, even in reasonably open weather, are falling off considerably. After their efforts to get together an interesting programme this is rather discouraging, and it must also be disappointing to the speakers, who have sometimes travelled considerable distances, to find themselves addressing a mere handful of people where the local membership is known to be quite strong numerically. Any who have useful ideas on this subject should pass them on to their C.R. or, even better, air them in the pages of the *Journal.*

Some C.R.s say they feel inclined to give up trying to run winter meetings owing to lack of response, but this would be a great loss to those who are interested and to the Club as a whole. We all know that many things can arise to interfere with our attendance at group meetings—a clash of dates, illness, adverse weather, a good T.V. or wireless programme, and so on. But surely our interest in the Club and in our fellow members should be sufficient for those of us who have the opportunity of attending meetings to reserve the necessary dates, which seldom total more than half a dozen throughout the winter. Now that most C.R.s send out a small printed syllabus of activities at the beginning of the winter season it should not be difficult to remember the dates of meetings and plan accordingly.

We have all read books and listened to lectures on how to construct a rock garden, but in this *Journal* an article strikes a new note, and a most refreshing note it is. A member writes on : "How **not** to make a rock garden"—telling us of all the trials and tribulations which accompanied the wrong approach to the problem till at length the correct method was learned by the hard way of experience and disappointment. Many other members, indeed most of us, must surely have had similar experiences and failures either in construction or plant cultivation at some time or other. Even a brief note recounting them might be of great help to other members and save them disappointment and perhaps discouragement. Perhaps the experts have forgotten the failures and errors of their early days (we have all had them, I am sure) and so are not able to put themselves in the place of the beginner, full of enthusiasm but perhaps lacking somewhat in practical knowledge in the pursuit of a new and exciting hobby.

Last year's Christmas Cards were evidently popular with members, because sales reached a record total. Orders also came in in good time, so that the labour involved in their dispatch was made much easier than is usually the case when a lot of last minute orders are received. It would help the Club greatly if last year's success could be equalled again or even surpassed this year. The fact that the illustrations used are shown in this number of the *Journal* means that although next Christmas seems a long way off just now there is no reason why members should not send in their orders while they remember and have the cards by them in ample time. This will save both them, the printers and Club officials trouble later in the year.

It will be noted that there is a paucity of black and white illustrations in this *Journal.* Only one photograph was submitted, and if it had not been for the goodness of Mrs. Wilkie, who took the trouble to look out some photographs when asked, there might have been no half tone illustrations at all. This problem was seen coming a year or two ago when so many members began to change over to colour photography. Colour is certainly very attractive, but the cost of its reproduction in print is quite prohibitive. We would therefore plead with any members who have good half tone photos to send them in with accompanying notes or articles on the plants or items they show.

St. Andrews, *April* 1961.

International Conference

ALTERATIONS IN PROGRAMME

OWING TO the great loss that the Club has suffered in Mr. David Wilkie's death, some re-arrangements of the Conference Programme have become necessary. We are fortunate in having succeeded in getting Mr. Davidian to replace Mr. Wilkie as lecturer ; his subject will be "Dwarf Rhododendrons." Since the Royal Horticultural Society has unfortunately arranged to stage their Rhododendron

Show in London on dates coinciding with the Edinburgh Week of the Conference, Mr. Davidian will be unable to take over the *time* of Mr. Wilkie's lecture and will probably be speaking on Thursday. If it can be arranged, Mr. Schacht's talk will replace Mr. Wilkie's on Tuesday, but the final programme will be posted both in London and in Edinburgh.

Club Members

WHILE THE normal influx of new Members from our winter meetings has continued, I would like to impress once again on all Members the necessity to keep up the rate of recruitment to the Club and, whenever possible, to increase it. As matters stand we are just barely able to keep our financial balance on the right side, and the Finance Committee is most reluctant to have to recommend an increase in subscription to the Council. Costs, however, are rising steadily and there are three courses open to keep the Club solvent : first and most important, a clear increase in the Membership, secondly a big increase in Show "gates," and thirdly an increase in subscription. The first two lie in the Members' hands—will you all please help ?

HENRY TOD

Discussion Week-End

7th-8th OCTOBER 1961

THE HYDROPATHIC, KILMACOLM

Saturday 7th	2.30 p.m.	Opening Address
	2.40 p.m.	"Plant Introductions of the Century" W. G. Mackenzie, Esq., Chelsea Physic Garden, London
	4.00 p.m.	Afternoon Tea
	5.15 p.m.	"The Branklyn Garden" J. T. Renton, Esq., C.B.E., Perthshire
	7.00 p.m.	Dinner
	8.15 p.m.	Brains Trust
Sunday 8th	10.30 a.m.	"Rock Plant Endemisms" Professor G. Pontecorvo, F.R.S., Glasgow
	11.40 a.m.	Break
	1.00 p.m.	Lunch
	2.30 p.m.	"A Floral Safari : from Johannesburg to the Cape" Mr. and Mrs. E. Darling
	4.00 p.m.	Tea
	5.00 p.m.	Close down

SUNDAY MORNING BREAK

During this period visits will be arranged to local Members' gardens.

CHARGES

(A)	RESIDENTS for the whole week-end, including full board and accommodation from 2 p.m. Saturday till 5 p.m. Sunday	£3 3 0
(B)	NON-RESIDENTS for the whole week-end, including meals, but WITHOUT Bed and Breakfast	2 2 0
(C)	NON-RESIDENTS—All lectures but NO meals	0 17 6
(D)	NON-RESIDENTS—3 lectures on Saturday—NO meals	0 10 6
(E)	NON-RESIDENTS—2 lectures on Sunday—NO meals	0 7 0

These charges include share of expenses and gratuities.

RESERVATION FORMS

These may be obtained from Miss Janet M. Woodrow, "Killochries," Kilmacolm, and should be completed and returned to her, accompanied by the appropriate cheque, as early as possible.

Those who wish hotel accommodation before and/or after the official week-end (i.e. other than Saturday night) should state their requirements and the accommodation will be booked for them. Extra accommodation to be paid by person concerned direct to the hotel.

QUESTIONS FOR BRAINS TRUST

Members who have any questions should send them on a post card along with Reservation Forms, or later.

S.R.G.C. Christmas Cards

THE CLUB CHRISTMAS CARDS for this year will be made from the four colour plates in this *Journal*—figures 25, 26, 27 and 28. They will be supplied in lots of **not less than one dozen,** which may be either all of one kind, or mixed, as desired. It will be sufficient to give figure numbers when ordering.

The price is 9/6 per dozen, post paid, including envelopes. Orders should be sent as soon as possible to the Hon. Treasurer, David Elder, Esq., Jessamine, Kirkhill, Penicuik, Midlothian, enclosing the necessary remittance.

The steadily rising costs of production and postage of the *Journals* can be offset to some extent by your active support of this Christmas Card scheme. Please place your orders **EARLY.**

Index To Journals 1 to 19

THE INDEX for *Journals* 1 to 19 inclusive (price 2/6, post free 3/-) is available to all who apply with the necessary remittance to the Hon. Editor : J. L. Mowat, University Botanic Gardens, St. Andrews, Fife.

Seed Distribution 1960-61

THANKS TO the generous donations of seeds from Members and the help given in making up the many packets and sending out the many orders, another Seed Distribution has been completed.

There was a slight decrease in the number of donors of seeds this year, probably due to the very poor summer of 1960 in this country and the effect of drought overseas. In spite of this, a greater variety of seeds was offered for distribution.

About two-thirds of the Overseas Members applied for seeds and it is satisfactory to know that they have this benefit from the Club, although they are unable to enjoy the Shows and local activities.

There is plenty of seed for all and, although seed of some rare alpines are often in short supply, there are many interesting species to be had that are quite easy to raise, which will enhance a garden at little cost.

If you are NOT a donor or an Overseas Member, APPLY FOR YOUR SEED LIST EARLY NEXT SEASON.

B. B. CORMACK

IMPORTANT NOTICE—SEED DISTRIBUTION 1961-62

AS THE September *Journal* is to be given over entirely to the Conference Report, will Members please note now the following arrangements for the Seed Distribution.

Donations of Seeds (or list of seeds "to follow") should reach me, Mrs. B. B. Cormack, 199 St. John's Road, Corstorphine, Edinburgh, 12, not later than 6th November 1961.

Seed Lists will be sent to Home Members who donate seeds and to ALL Overseas Members. Other Home Members may obtain the Seed List by sending a stamped (2d) self-addressed envelope, marked "Seed List," to me at the above address, before 1st December 1961.

Orders.—Detailed information will be included on the Order Form attached to Seed List.

Surplus Seed.—Application should be made not later than 15th February 1962, enclosing stamped addressed envelope. Overseas Members please send International Reply Coupons. Do NOT send this application with Order Form.

NORTH PERTHSHIRE

Thursday 15th June 1961, at 2.30 p.m. : A visit has been arranged to Ascreavie garden, Kirriemuir, Angus, by kind invitation of Major and Mrs. G. Sherriff. Would members who intend taking the opportunity to visit this beautiful garden please let me know before 27th May 1961. Mrs. M. R. Stuart, Tigh-a-Chladaich, Moulin, Pitlochry.

International Rhododendron Conference

SHORTLY after the International Rock Garden Plant Conference—from 11th to 14th May, to be precise—an International Rhododendron Conference is to be held in Portland, Oregon, U.S.A., under the auspices of the American Rhododendron Society. An exceedingly interesting programme which will appeal to all rhodo. enthusiasts has been arranged and includes lectures and talks by well-known authorities from several countries. British speakers will include Dr. H. R. Fletcher of R.B.G. Edinburgh, Mr. Frank Knight of Wisley, and Sir Giles Loder officially representing the Royal Horticultural Society. In addition to the lectures, tours to gardens and parks, etc., in and around Portland have been planned. The Secretary-Treasurer of the American Rhododendron Society is "Mrs. R. M. Hansen, 3514 N. Russet Street, Portland 17, Oregon, U.S.A."

David Wilkie, A.H., R.H.S.

THE SCOTTISH ROCK GARDEN CLUB lost one of its keenest and most loyal members in the death of David Wilkie on 5th January—little more than two months after the A.G.M., when the state of his health compelled him to give up the Presidency of the Club. A founder member in 1933, his absorbing interest in the Club never wavered from then onwards right up to the day of his death. He was always ready at the beck and call of office-bearers, or any member, with sound, level headed advice and carefully thought out opinions on matters of Club policy, show organisation and procedure, plant cultivation, or anything else which might be asked of him, content to work away quietly behind the scenes and help whenever and wherever needed.

His wide knowledge of plants was phenomenal and gained him the respect and esteem of plantsmen throughout the world, as did his authoritative book on "Gentians"—first published in 1936—and his many other writings in various horticultural publications. This wide knowledge and great love for plants could be no surprise to those who knew his history. From the time he entered the Royal Bo-

tanic Garden as a youth in or about 1907 plants became his life's work and wherever he went in ensuing years was where were outstanding collections of recently introduced shrubs and hardy plants. His world wide reputation in horticultural matters was no more than justly recognised when in 1946 the Royal Horticultural Society made him an Associate of Honour.

In all his contacts David Wilkie showed a warm-hearted friendliness for all who shared his keen interest in plants, while at the same time he was impatient of false values. He gave of his wide experience equally generously whether in debating technicalities with fellow experts or helping and encouraging beginners in their early efforts in gardening. His warm smile and quiet word of friendly greeting will be missed by all who knew him well.

Our warm sympathy must go to Mrs. Wilkie, who so ably supported and encouraged him in all his activities and interests.

"Locum Tenens"

IT SEEMS many years ago (actually September 1951) since the first short article signed "Locum tenens" appeared in the pages of the *Journal.* The writer was very modest concerning his 'small contribution' and since it concerned trials and troubles while in temporary charge of certain plants and seedlings, he hid his authorship under the pseudonym of "Locum tenens."

This name at once came to be looked for with eagerness in each succeeding *Journal* by members, both those who took an active part in growing and showing and those whose Club interests were rather less active. Letters of appreciation and enquiries concerning the identity of 'L.t.' arrived regularly after each *Journal,* chiefly I think because so many could see themselves in the situations so aptly and humorously described. In spite of all enquiries and probing the identity of "Locum tenens" remained unknown to all but a very limited few right to the end, and few could have known that the writer who gave them so much pleasure was all the time having to fight against illness and pain.

The long and happy association between editor and loyally regular contributor would have appeared to have ended with an obituary notice in the *Scotsman* of 8th February of the death the previous day of Major-General D. F. McConnel, C.B., C.B.E., D.S.O. But even this was not the end of 'L.t.'s' connection with the *Journal.* The following morning his last contribution arrived by post with a covering note from Mrs. McConnel to say that it had been ready for sending just before he died. One cannot help feeling that this end typified the man.

Cuttings

By CHRISTIANA BOYD-HARVEY

WHY GROW rock garden plants from cuttings ? Why not grow everything from seeds, when our Club membership gives us so good an opportunity for acquiring them from far and wide ?

Vegetative propagation is of use because it enables us to select and perpetuate unusually good forms of species which have been raised from seeds. One packet of seeds may produce some plants which are of outstanding horticultural merit and others which in some way or another fail to attain the high standards for which we had hoped. If seeds are saved from the best forms, there is no certainty that the characteristics we expect will occur again throughout the next generation, but cuttings taken from selected plants will perpetuate their desirable qualities. *Dianthus alpinus, Potentilla nitida, Pulsatilla vulgaris, Saxifraga oppositifolia,* and *Silene acaulis* are among those species which may be brilliantly floriferous or miserably poor and dull, so cuttings should be taken of any which are outstandingly good.

Propagation from cuttings is a means of increasing any good variations which occur amongst wild plants. All the named forms of *Calluna vulgaris* are growing in gardens because people with good powers of observation have noticed variants from type when walking through the heather on hills and moors. The nurseries have increased these single plants by the hundreds so that anybody who wishes may have such beauties or oddities as *Calluna vulgaris* 'H. E. Beale,' 'County Wicklow,' 'August Beauty,' 'Mrs. Pat,' 'Tom Thumb,' 'White Mite' and a few dozen others.

Hybrids between different specis of a genus may be sterile, or reluctant to set seed, or perfectly fertile. Seeds which are sown from first generation hybrids will produce a swarm of nameless mongrels showing new combinations of characters and consequently much diversity in size and colour. There is always the happy chance that one of these will be horticulturally a great advance on its parents and grandparents, and its raiser will seek a new name for it and will thereafter propagate it vegetatively. *Primula* 'Dianne,' raised at Inshriach and seen at last year's Edinburgh Show, is of very mixed ancestry, the child of two different hybrids, but it has now received its R.H.S. Preliminary Commendation. If, however, the grower does not want to take a gamble with seeds, but needs to increase his stock of say *Primula* 'The General,' *Gentiana* 'Inverleith' or *Saxifraga x jenkinsii,* cuttings will ensure exact replication.

Bigeneric hybrids are invariably as sterile as mules, so plants such as *x Halimiocistus sahuci* and *x Phyllothamnus erectus* can be propagated in no other way than by cuttings.

There are also true species and natural inter-specific hybrids which are reluctant to set seed in cultivation. Sometimes this is because there is only one specimen in the garden of a self-incompatible plant, or

all the specimens may be one clone and therefore incompatible with the other portions of "self" scattered about the garden. *Sagina boydii* has only once been found growing wild. This was in 1878, and all the specimens in cultivation are derived from cuttings of that one and only plant. It flowers, but never sets seed.

Strangely enough, the Scottish natural hybrid willow which also commemorates the name of William Boyd, has also been found on only one occasion and never again. The many specimens growing in gardens and stone troughs are cuttings from Boyd's original willow, and they all bear only male catkins, so no seed is possible.

Then there is *Primula aureata*, which for many years had never been found wild anywhere at all. Botanically it had no right to exist, but there it was by the hundreds in frames and alpine houses, all derived vegetatively from the original "weed" seedling found in 1935 at the R.B.G. Edinburgh. It was in cultivation for years before Mr. David Livingstone at last obtained two seedlings. It was not until 1952 that it was found growing wild. At the last Edinburgh Show, Mr. R. B. Cooke was exhibiting a specimen grown from wild seed, but the plants which most of us have are derived from fragments of the original R.B.G. seedling, and unless we are lucky and observant enough to find some viable seeds we must perforce propagate vegetatively.

Primula clarkei also sets seed only very occasionally. I have never seen a thrum-eyed flower in this garden nor in other gardens, nor in photographs, nor line drawings. Bees ignore it, and because it has a long style, ripe pollen cannot drop from the anthers on to the stigma as it does in *Primula scotica*, which always has a short style. *P. clarkei* is therefore usually propagated from rosette cuttings or divisions, and *P. scotica* always from seed. A difference of a couple of millimetres in style-length can thus dictate the propagation method for these two primulas.

Safely wrapped up within their dry waterproof coats, seeds contain the embryos of complete plants, and they await only a favourable environment to grow harmoniously into mature plants with perfect balance between shoots and roots. In contrast with this, a cutting is only part of a plant. Sometimes it is a stem with no root, or a piece of root with no shoot, or an invisibly small leaf-bud with no root, or occasionally it may be no more than a leaf. The problem is to keep alive this amputated invalid and hasten the time when it will become whole again. The grower can assist nature by taking the cuttings at the correct moment in the life-cycle of the plant, at a favourable time of year, and at a position on the plant where growth is most active.

Rapid growth is a characteristic of youth and it is observed not only in the kitten, chick and caterpillar, but also in the young immature plant. As the organism approaches full development and the reproductive phase, there may be very little further increase in overall

size. Juvenile speed of growth is accompanied by the capacity for easy regeneration of certain missing parts. The tadpole which loses a leg is able to grow a new one, but the old frog cannot do so, and the small human boy needs a haircut more frequently than his grandfather. Cuttings taken from seedling plants are able to grow new roots with surprising rapidity. If only a few specimens of a new and rare plant have been grown from seed, it is wise, if they are growing vigorously, to increase their numbers by taking a few cuttings. They will never again root so easily as they do when immature and unflowered. Unfortunately there is no knowing until they flower whether they will be good horticultural forms of the species, but that is a minor problem which can be faced after the new plant is firmly established in cultivation.

When shrubs and other plants have been allowed to reach a mature age before the decision is made to propagate them, it is often possible to find a ring of new shoots near the scar where the plant has previously been pruned or severely cut back. The healing of the pruning scar appears to stimulate vigorous growth in its vicinity, and the rejuvenated shoots which arise there have no flower buds. Because of their immaturity, they make good cutting material. A shoot which is directing all its energies towards flowering and fruiting is not able at the same time to produce new roots.

In Spring when days lengthen and temperatures rise all nature is rejuvenated, and plants both young and old break into vigorous growth. This is particularly noticeable in those which die right down or lose their leaves in autumn and have the benefit of proper winter dormancy at low temperature. These new Spring growths make good material for cuttings in the case of plants which flower rather late in the year, for example *Campanula isophylla*, *Crassula sarcocaulis*, *Cyananthus* sp., *Gentiana septemfida*, *Hypericum* sp., *Sedum cauticola*, *Fuchsia* 'Tom Thumb,' *Tunica saxifraga* 'Rosette' and others.

Spring is not a suitable time to take cuttings from plants which flower in the first half of the year, because they will already have initiated their flower buds late in the previous year, and there they lie all ready to develop when the snow and ice begin to melt. For these plants which flower in the early months, there is a "second Spring" when vegetative growth is resumed. This period when flowering is over is a suitable time to take cuttings of the great majority of plants. The exceptions to this general rule are, as indicated in the previous paragraph, those which flower late and then die down for the winter.

Having decided which plants ought to be propagated, and when this should be done, the next problem is, where should the cut be made ?

The growth substances which induce division and elongation in the cells of stem, leaf and root, are manufactured in the leaves, particularly the younger leaves near the apex of each shoot and branch.

They accumulate at the nodes between leaves and stem and at the junction of young side branches with the older main stem. Other substances which repair wounds are liberated from the damaged cells at the cut surfaces. (Have you noticed how quickly a bitten apple turns brown ? This brown scar tissue is much more apparent in an unripe windfall than in a nice ripe fruit taken out of store).

There is also a mechanism for regulating the root : shoot ratio, which of course has to be variable in accordance with the soil and atmospheric conditions in which the plant finds itself. Cuttings which are taken through a node or at the junction between new and old wood will be more inclined to heal and regenerate quickly than those taken from a part of the plant which has been laid down for some time and is no longer growing actively. A small cutting will become a "balanced" plant more quickly than a long straggling growth which needs a large root system to support it.

There appears to be exceptional capacity for regeneration at the neck of a plant where shoot meets root. Rosette plants and others which have their growing points close to ground level such as *Morisia monanthos* (syn. *M. hypogaea*), *Erodium reichardii*, and *Dodecatheon* species, may be decapitated, and then the shoots will readily grow new roots and the roots left undisturbed in the ground will send up an endless supply of new shoots which may be decapitated again and again. This method is only recommended for good-tempered plants with fairly thick roots. It is not suitable for difficult cushion plants with hairy leaves and fine fibrous roots. These are better from seeds, if obtainable, or from single rosette cuttings.

Other ground-level cuttings are the so-called leaf-cuttings of Gesneraceae and Petiolares primulas. The growing point is not on any part of the leaf blade but is actually a minute vegetative bud at the base of the petiole. Several sedums propagate themselves in this manner, by shedding whole leaves each with an invisible basal bud.

The double-flowered form of *Cardamine pratensis* is the only rock garden plant which I have propagated from *true* leaf cuttings. This native plant is unable to set seed because all its organs of reproduction have become petaloid. In nature it sheds its leaves on to the ground and there they grow. If leaves are taken after the plant has flowered, and are chopped with scissors on to pots of very damp compost or sphagnum each fragment which includes a piece of mid-rib will give rise to a shoot and a root.

Propagation from root cuttings is often advised for plants which do not make much top growth. *Morisia monanthos* and good colour forms of *Primula denticulata* are usually cited as suitable for this treatment, but the disadvantage of the method is that it involves the destruction of the old plant, whereas decapitation leaves the roots in the ground in full working order. *Pulsatilla vulgaris* 'Mrs. Van der Elst,' that ethereal pink form which does not come true from seed, has to be propagated from root cuttings. It is possible to probe down

with secateurs or scissors to cut off only one thong of the rootstock without uplifting the whole plant. This will provide several root cuttings. I am told that *Weldenia candida* may be propagated from the piece of root which grows out of the drainage hole of its pot into the sand plunge bed, and no doubt other plants with fleshy or woody roots could be tried in the same way.

Sometimes a root cutting from a shrub may be obtained in gradual stages. If there is a horizontal woody root close to the surface it may be cut halfway through. A vegetative bud will, with luck, form near the cut and then this piece of root and shoot may be cut away and grown on. I have sometimes accidentally practised this kind of propagation through careless use of the trowel.

Cuttings may be taken (or rather pieces may be broken) from other underground organs such as the bulb scales of *Lilium* and *Fritillaria*, the rhizomes of *Oxalis laciniata* and *Anemone nemorosa* forms, and the tuberous swellings on the straggling underground stems of *Tropaeolum polyphyllum* and *T. speciosum*. All cuttings from below ground are best taken after flowering and after all top growth has died down.

The easiest cuttings of all are the so-called "Irishman's Cuttings" —those shoots, while still attached to the old plant, show the beginnings of roots on the undersides of the branches. *Penstemon pinifolius* and most other species of that genus have these adventitious roots and if they meet nothing but dry hot rock they will wither and die. If left to root all round the old plant, its centre will become bare and flowerless, so a few cuttings should be taken for replacements. It is important to cut them at the right moment when the roots are just beginning to grow; if left until they have dried they can be very obstinate. The adventitious roots near the tops of the shoots of *Hydrangea petiolaris* are designed for climbing and clinging, but if they are caught at the moment when white and fleshy, they may be tricked into becoming soil roots. A watchful eye should be kept for any other plants in the garden which may be propagated as easily as this.

When rooting cuttings from shoots it is essential to maintain full health and activity in the leaves so that they may manufacture growth regulating substances and sugars to promote root formation and growth. Light is necessary for the leaves, and the cut ends of the stem need moisture and air and are stimulated by warmth. Too much light, too much water and too much heat can all have an adverse effect.

Wilting of the leaves may be prevented by keeping them perpetually cool and wet. In a number of large gardens where thousands of cuttings are required, this is achieved with mist-propagation installations. The cuttings are inserted in a rooting medium which drains rapidly and is provided with bottom heat. The leaves are sprayed intermittently from fine nozzles which switch on and off automatically, maintaining

a thin film of water on their surfaces. This keeps them cool so that there is no bleaching in full sunlight.

The favourite method of the green-fingered novice ("Push them in anywhere and they will grow !") is often successful, if the cuttings are put into warm ground during one of those spells of weather when natural intermittent spray descends from the heavens.

Most of us do not need to raise enough cuttings to justify the expense of mist-propagation houses, nor do we care to trust natural rainfall to keep valuable or difficult cuttings alive. Instead of keeping the leaves perpetually wet as in mist-propagation technique, transpiration from their surfaces may be checked by surrounding them with an atmosphere of high humidity. This may be achieved in a small frame, or in wooden boxes or large pans covered with panes of glass. Inverted jam-jars can give quite good results when garden accommodation is very limited. If there are already large frames or a glass-house in the garden, smaller frames within the larger frame or house will make it easier to build up humidity. These may be no larger than tomato boxes, each with a properly fitting pane of glass. Polythene is sometimes recommended for frame lights instead of glass for the sake of its lightness and low cost. It is a material with dozens of uses in the garden, but it is inferior to glass for cutting frames because it passes out the warmth accumulated during the day as soon as the temperature drops at night, whereas glass is able to retain it. It very easily becomes lifted by high winds, and is punctured by careless handling. It is quite suitable for small frames within a glass-house, or for covering individual pans within a large frame.

If a small frame is to be reserved exclusively for cuttings, its floor is covered with smashed bricks or other drainage material. This is spread with sand to a depth of about three inches for receiving the cuttings. If this is of too fine a grade, aeration will be inadequate, and if too coarse it will give insufficient support to the cuttings. I am now using a mixture of Sesame ground sandstone and silversand. Other materials which have been recommended are powdered pumice stone, Tay river sand, Vermiculite, and various mixtures of sand, peat and sifted soil.

I myself would not risk using soil in a cutting frame, because those bacteria which break down dead vegetation in the soil might attack the injured cells at the cut, and then the infection could spread throughout the cuttings. After the rooting sand has been smoothed over it is watered to settle it. While the frame is empty, it is a good idea to give it a canful or so of really hot water.

As the cuttings are collected, they are dropped into a polythene bag to prevent wilting, and then their bases are trimmed with a razor blade. The depth to which they will be inserted need be only sufficient to keep them firmly upright, and all the leaves which would be below this are cut or nipped off. A trench of required depth is made in the

sand with the edge of a ruler, and the cuttings are inserted so that they will not be too crowded for easy lifting when they are rooted. The sand is pressed firmly back, and the cuttings are labelled with name and date. They are not watered again yet, because this would dilute the natural wound-healing substances at the cut surfaces.

It is impossible to generalize about how soon the frame should be given its next watering, and how frequently thereafter it will need attention. This depends on its site in the garden, its freedom from air-leaks, the cubic capacity of the air space between sand and glass, and external weather conditions. In overcast weather it needs little watering and no shading, but in brilliant sunshine it needs watering several times a day, and perhaps some shading with wooden slats, strips of perforated zinc, or other convenient material. The aim should be to strike a happy medium between allowing the leaves to wilt and drenching the sand too copiously.

If after a few days the leaves begin to show signs of yellowing, it is because too much light, too high an air temperature, and perhaps too much water are together bleaching the chlorophyll. Shade during the heat of the day must be given temporarily so that the leaves are given a resting period to recover their green colouration.

Small cuttings of *Morisia monanthos* and Kabschia saxifrages are safer if given individual pans of sand filled nearly to the brim. A pane of glass actually pressing on the cuttings maintains them in contact with the sand until they are able to take hold with their own roots. Petiole bud cuttings are also put into pans, but must be clear of the pane of glass. Soft and hairy rosette cuttings need special treatment. The glass must not touch them, and they must be watered from below. They should rest at an angle so that condensation water on the glass runs to one side and does not drip on the rosettes. It is better not to have them in the same frame as the other plants, because their special needs interrupt the routine procedure of overhead watering.

It is not everybody who has the time for giving assiduous daily attention to the cutting frame ; many of us are able to enjoy gardening only in odd snippets of time snatched in the intervals between work and play. My own compromise solution is to have the frame so that it receives full light during the morning, and then from noon onwards a shadow is cast on it by a lilac tree. Those who are only able to work in their gardens at weekends may have to build the cutting frame in permanent shade, or make some kind of slatted shades which could be removed when convenient, and during dull weather.

Cuttings taken with a heel in the old traditional way are better able to survive neglect than those cut through a node, but they may take a very much longer time to root. It is a case of sacrificing speed for the sake of safety.

The length of time that cuttings take to root varies with each individual and the treatment it has received. Successful rooting is nearly always indicated by pale green growth at the tips of the shoots.

Photo—S. Mitchell

Fig. 25—Dianthus neglectus (see page 246)

Photo—S. Mitchell

Fig. 26—Omphalodes cappadocica (see page 246)

Such cuttings are carefully lifted without tearing the roots, and potted in John Innes Seed Compost with a central core of pure sand. Their subsequent treatment will depend on the weather, remembering that a root system large enough to support a cutting in a humid frame will be inadequate for full sun and gale force wind. In 1960 the newly potted young plants could take their chance in a sheltered place in the garden, but during the drought of 1959 gradual weaning and hardening off was necessary.

When rooted cuttings are being lifted for potting it is a good opportunity to examine those which are still not rooted. Are they larger or smaller than those which have responded to treatment? Are they in a position in the frame where they received more or less sunlight or more or less attention from the watering can than the others? Have they corked over yet? If so, another slight wound with the finger nail may stimulate them to further activity. Have some of them blackened? If so, they must be thrown away. Have some of them rooted and dried out? If so, they may recover with more watering and shade.

During the last week in August I put in a batch of cuttings of *Hebe macrantha*. They were post-flowering cuttings about 3 ins. long except one which was so small that about ¾ in. of riper wood was included at its base. They were examined during the first week in October and all had formed a good layer of cork at the base, and all except one had a fringe of roots around the cork. This one, the smallest, had no roots at the base, but they had all arisen ¾ in. to 1 in. higher up the cutting. Those cuttings were clearly demonstrating that *Hebe macrantha* should in future be cut at the new growth of green wood.

First-hand observation of plant behaviour is much more convincing than information obtained second-hand from books and articles, though these have their uses in starting lines of thought and plans of action. Every cutting, whether it succeeds or fails, has something to teach its grower.

No reference has been made to the use of synthetic rooting hormones. These should not be regarded as substitutes for proper care and attention, but used in connection with bottom heat and humidity, they give obstinate cuttings the boost that they need. They are also of value for cuttings which one may be given by generous fellow members when visiting their gardens at an unfavourable time of year.

Root cuttings, rhizome cuttings and bulb scales do not need frame treatment. They may be planted right way up (or sideways, if in doubt) in pans or boxes of sand in a shady corner. They are all food storage organs, so all the attention they need is occasional watering in dry weather, and they are left there until their normal time of growth comes round. In gardens where there is plenty of space to spare, they may be planted directly into their final positions instead of in pans and boxes. The limits of the planting must be well defined with a

circle of labels. This direct planting saves work for the grower and saves the new plants from root disturbance.

I know that there are many successful propagators who will query the need for all this fuss and paraphernalia. They get their results by pushing all their cuttings into ordinary garden soil, between shrubs, at the back of the herbaceous border, against brick path edgings, or at the foot of a north wall. Fortunately many plants have a natural urge to regenerate and will respond with a high proportion of success to the most happy-go-lucky methods. Twigs of woody deciduous plants thrust into an odd corner will often come through long periods with no attention. There are no leaves to give off water and there is a store of food material in the wood. When Spring comes, roots sprout and leaves unfold simultaneously.

The branches of *Ribes sanguineum*, which we cut carelessly in January, remain in stagnant water for weeks. They open their pale flowers, and when the time comes to throw them away it is found that the containers are full of tangled roots. We have several trees of *Salix daphnoides* which arrived here as branches of pussy willow for room decoration, and they too produced long roots in the water. A friend at North Berwick had a fence erected some years ago. Stout stakes were driven in to support it and one of them has grown into a splendid laburnum tree.

A frame of some kind, however, is a useful possession to have because it provides an artificial micro-climate of "good growing weather," so that even when external weather conditions are unsuitable, the more difficult cuttings may be persuaded to root, and easy cuttings may be raised with greater speed and certainty.

Raising plants from cuttings is one of those gardening skills which is particularly rewarding when a rare and valuable plant is given a new lease of life and becomes more widely distributed to those who appreciate it.

There is a legend that when Joseph of Arimathea visited Britain, he drove his staff into the ground to mark the future site of Glastonbury Abbey. It rooted there, and flowered on Christmas Day. Centuries later, when Cromwell's Roundheads came to the Abbey, they destroyed the famous Glastonbury Thorn, but did not know that there was another tree near at hand which had been raised from a cutting. This second tree has been the source of all the subsequent plants of *Crataegus monogyna praecox* which have found their way to distant parts of the world. One of them is in the care of our Editor at St. Andrews University. It is a graft of two scions on a young common hawthorn, and this ancient but rejuvenated tree still opens scattered trusses of flowers on old Christmas Day in early January.

Icy Patches

By "LOCUM TENENS"

THAT IS as good a title as any I can think of, though there were, of course, some other things too, including the telephone. In any case this tale, even if it has no other merit, is quite true.

Last winter we again went south for Christmas. We were at home in Scotland when, on a Friday evening in the middle of December, it snowed. The intention had been to start off on the following Monday in our small car on the 400 mile trip to London and obviously weather conditions mattered a lot.

On the Saturday morning our local bus was two hours late and the postman arrived on foot, having got his van stuck in a snowdrift somewhere. In fact, we seemed to be well snowed up. During that day the sun shone and a little of the snow melted, only to freeze again at night to make it even more slippery than before.

Weather forecasts can be dismal things, and we suffered severely from a series of them. Their refrain remained the same. "Icy patches on the roads. Snow on high ground. Fog, dense in place and slow to clear."

On the Sunday night we had decided not to start on Monday. On Tuesday I telephoned to my sister in London. I asked her to ring up a particular motoring organisation. I gave her the number, which was a special one, so it said, for urgent information about roads and weather.

Later she told me what happened. She dialled the number and a voice said "For fifty miles north of London there are icy patches on the roads. There may be some snow. The fog is dense in places and will be slow to clear. South of London there is . . ." Here my sister butted in and said she was not in the least interested in South of London, because her brother wanted to motor from Scotland. But the voice paid no attention and went steadily on to describe the fog which apparently also existed both East and West of London. My sister was gradually getting frantic. Whoever was giving the information seemed to pay no attention to her. Eventually the voice started all over again : "For fifty miles north of London there are icy patches . . ." My sister then had hysterics. When she recovered, rather later that night, she tried to ring me up. She gave the exchange our number and, wanting to be helpful, she added : "I think the call goes by air (Ayr)." When the operator said "Yes, by jet," she gave up.

Meantime some of our preparations for the trip began to become doubtful. We had picked a large bunch of flowers to take with us. These looked like wilting. I had secured a pheasant, which had been a bit slow in taking off, and I was not sure how long it would keep. Pot plants, which had been packed in the boot of the car, did not seem to like it very much. The eggs, presumably, would last a long time.

On the Thursday morning we set off. I still do not know why. Weather reports of icy patches were just as bad. There had been 14 degrees of frost during the night and it was a bit foggy. For some miles we slithered about, having many arguments as to whether any particular bit of road was wet or solid ice. Gradually confidence returned and we dared up to 40 m.p.h. occasionally. Then everything suddenly changed. The sun came out, the road dried up, and all mist and fog disappeared. Our speed increased—my wife was now driving—and we reached our hotel at the half way mark bang on schedule.

Next day it was raining at dawn, but immediately we started the sun shone. We had a perfect run.

On arrival in London I unloaded the car. The flowers seemed to have recovered in some mysterious way. The pot plants looked happy again. The pheasant was quite quiet and not an egg was broken. Moreover, I had at last thought of a really suitable Christmas present for my sister. I would give her a gramophone record or tape recording, but not this time one about the weather.

Rather a simple little story, say you, and nothing to do with gardening. I agree, but what with icy patches, the telephone and the Christmas Fairies helping us, it was a wonderful journey.

How Not To Make A Rock Garden

By B. G. HENDERSON

THE PIECE of ground opposite the front door rises abruptly. The only possible means of beautifying it was to build a rock garden. Several rocks protruded at intervals to prove that it had once been one. It now grew lupins, dockens and rough grass. The few rock plants that survived were almost weeds, *Sedum acre* in abundance, *Sempervivum tectorum*, *Arabis albida*, *Saxifraga decipiens* and *Cerastium tomentosum*. In Spring it was studded with huge clumps of daffodils.

The battle commenced when the daffodil leaves withered. The bulbs were forked up to be stored for planting elsewhere. I started at the front of the garden. Most of the rocks having tumbled down to this part, I was soon at a loss as to where to store them. Also there was a plentiful supply of stones about the size of an egg, covering the surface. They were a great hazard. I repeatedly twisted my ankle and caused a land-slide only to arrive involuntarily several feet below the tools. The stones were gradually removed to make the foundation of the kitchen garden path. When that was completed, an obliging neighbour took all the stones we could give him to make paths also. The lupins and dockens defied all attempts to dig them out. After I had broken the shafts of both spade and fork, I invested in a roadman's pick. With it I achieved the removal of the lupin and docken roots and acquired a sore back.

Because of maternal objections to a battle-ground at the front door, I foolishly tried to plant out the ground as it was cleared. My idea was to make pockets of soil, surrounded by rocks, in which to plant my treasures when they were acquired. Here I was helped greatly by fellow members who kindly gave me cuttings and instruction.

Nearly two years elapsed before the area was cleared and sparsely planted out. Apart from routine weeding I thought I had nothing else to do. It soon became obvious that the construction was faulty. All would be quiet, then an ominous rumble and thud announced another rock on the path. Presently I noticed several plants lying on the surface, roots exposed. Truthfully I could say I had bedded the rocks in well and I had planted firmly. What could be wrong ? One day after heavy rain I noticed the soil running in rivulets down the garden. Here was the fault. The slope was so steep that rain drained off immediately, taking the soil with it.

About this time I had been visiting gardens belonging to members of the S.R.G.C. I was ashamed to ask them to return the visit, as my lack of knowledge would roar at them the moment they arrived. One Saturday, after visiting a particularly delightful garden, I went home fired with enthusiasm. I was going to draw a plan of the garden and reorganise it completely. Early Sunday morning the plan, which included a pond, was finished. Only darkness prevented me from starting the task at once. The main idea was to reduce the steep incline by building retaining walls and levelling the areas between. Also, with increased knowledge I now realised that I required a part for lime lovers, another for lime haters, and one for the in-betweens. First, I divided the garden into two, to the east the lime haters, to the west the lime lovers. Then I divided it horizontally into three uneven parts. With garden line and a great many twigs I marked out the lines of the retaining walls. Then I decided on the position of the pond. As I could not wait to make a cement one, I used two old horse troughs set in an L shape and sunk into the ground.

At this point I suddenly had more earth than I required, and it had to be carried away in buckets to another part of the garden where the soil was very shallow. Once the troughs were in position, I camouflaged the edges with rocks. Then I started to build the retaining wall with stones from the garden. During the building of the wall I planted it with as many wall plants as I could get. Another difficulty was the transplanting of the plants from the area where the wall was to be. A few I could put immediately into their permanent position, but most were pushed around for several weeks. I was very lucky as I only lost three, and they were easily replaced. When the wall was half built I ran out of stones. However, a friend had a dry stone dyke he wanted demolished, so I helped with the demolition in return for stones. After a few weeks the wall was built. I had included four steps in the construction, leading to the next part. I was particularly proud of this achievement.

The next major task was to set stepping stones along the lower part. After that some of the unfortunate plants found their permanent quarters. East of the pond I planted two heaths, two small conifers and some *Gentiana sino-ornata*. They looked very forlorn, but I promised them the companionship of dwarf rhododendrons when funds permitted. To the west of the ponds went the commoner rampant growers. Most of these have now been replaced with things like *Gentiana acaulis*, European primulas, and several of the species crocus, narcissus and iris.

The top retaining wall was built next, using as large rocks as I could manage, because it had to hold up half a hill side. The third wall was much shorter, but again a few steps were built into it to give access to the top part of the garden.

The part between the second and third walls was to be planted mainly with lime-lovers. The problem was to provide the lime. According to books—old mortar rubble was the answer if it could be obtained. I obtained it by knocking down a dividing wall in outhouses that we intended to reconstruct in the future. The calcicole plants certainly flourished in it.

The construction of the rock garden now completed, I turned to the landscaping problem. The top boundary was rather bare looking. As I had plenty space I planted a young rowan tree at the east of the second area and a very small silver birch about the centre of the third area. This part is now set out with woodland plants. In the lime area I have tried to collect Euaizoon and Kabschia saxifrages and representatives of the dianthus family. Near the rowan tree I intend to plant a variety of dwarf shrubs, but meantime it has been used as a parking ground for excess seedlings from my seed exchange ventures.

This rock garden, started with more enthusiasm than knowledge, has given me great pleasure. I hope the description will help others to avoid the pitfalls through which I wallowed.

With Silver Foliage

By R. F. WATSON

ROCK PLANTS with silver foliage always seem to create interest when seen either in the garden, as pan plants for the alpine house, or on the show benches, and most attractive plants they are for any of the purposes mentioned. There are a great number of them, the natural order Compositae perhaps providing the biggest proportion, and probably the next largest group belong to the natural order Labiatae. Judging from what I have noticed at Shows, the term 'Silver Foliage' is used to cover plants with foliage from glaucous blue-grey to white woolly, and I have never yet seen any card marked "Not according to Schedule." I feel, therefore, that it is justifiable to use the same latitude in describing some of the plants I grow and of which I am very fond. For the most part these are not difficult to grow, but one thing they all have in common; they are avid sun lovers and demand a warm, well-drained soil.

The achilleas have among their number many good silver-grey foliaged plants which are well known, but one that is less common is *Achillea sp.* from Mount Korab. Until I can propagate this it is treated as an alpine house plant. Its habit is tufted, with silky grey foliage with smooth edges except for the tips which are notched. This form was reputed to be one of the late Dr. Giuseppi's introductions and has never become very well known. My next choice is somewhat of a mystery as far as names go. I recently acquired under the name of *Chrysanthemum ptarmicaefolium* a very beautiful plant with silver-grey foliage as finely divided as any fern, making a shapely bushy plant. I cannot trace this name but have found *Achillea ptarmicaefolia*, so am of the opinion that my plant must be this; but whatever name it bears, it is most attractive.

The genus anthemis, closely allied to the achilleas, gives us *Anthemis barbeyana*, a loose cushion plant for the scree bed with much cut silvery white foliage and short sprays of white flowers, and *A. bieberstеinii* with finely cut grey foliage and bright golden yellow flowers. The more recently introduced *A. rudolphiana* is rather similar but larger and bolder in habit with the same bright yellow blooms. The artemisias are well known as good "silvers." *Artemisia brachyphylla* is rather uncommon and makes a prostrate dwarf shrub the trailing branches of which are clothed in thin foliage so brightly silver as to resemble the tinsel of decorations. *A. glacialis* is a choice high alpine plant best used as a pan subject, making a close mat of tiny silver-grey foliage, and is reputed to do best in a lime free mixture. *A. mutellina*, sometimes known as *A. laxa*, is somewhat similar to the well known *A. lanata*, syn. *A. pedemontana*, but is more prostrate in growth, more silver in colour, and a tidier plant.

Chrysanthemum atlanticum is a native of North Africa and not hardy enough for outdoor cultivation, but it is a beautiful alpine house

plant with finely cut grey foliage and large white daisies. A comparative newcomer is *C. haradjanii*, a mat-forming plant of silvery white foliage which, despite its rather exotic appearance, is completely hardy and stands our wet winters very well.

Eriogonum crocatum, though not hardy enough for outside use, is a lovely silver for the alpine house. The flowers are of no account and should be cut off, but in foliage it is about the nearest to true silver foliage of any plant. *E. ovalifolium* is a sub shrubby plant, very grey of leaf and again with not very attractive flowers but an excellent silver foliaged plant without them. *Euryops evansii* is a choice dwarf shrub, hardy enough for Southern England but perhaps best treated as an alpine house plant in Scotland, with silky grey foliage and yellow daisies. It is apt to grow leggy and untidy if not cut back, but bears pruning very well.

There are many grey-leaved helichrysums but I shall confine myself here to two which may not be so well known. *H. aciculare* is a plant for the sunny scree, where it will run about but not become very invasive, with rosettes of round grey-green woolly foliage and bright yellow "Immortelle" flowers carried singly on six-inch stems. *H. lithospermifolium* is a dwarf shrub with narrow almost white foliage and lemon yellow flowers in heads, for a warm, sheltered place.

Origanum or *Amaracus dictamnus* brings us to the Labiates, and is a plant with very woolly grey foliage and the usual hop-like flowers of the family for warm, dry places such as a sunny wall garden. *O. microphyllum* is a recent introduction to my garden and I have not yet seen its flowers, but in habit it is a prostrate mat of round, very grey, small foliage and should make a good cover plant for dwarf bulbs. From the same good friend who gave me this came *Phlomis alpina*, a dwarf tufted plant with very white woolly foliage and flower heads on stems of about six inches and, if hardy, it should be a pretty addition to the summer flowering rock plants.

Teucrium aroanum has a tufted habit with silky grey-green foliage and curious grey-blue hooded flowers which are attractive in an odd sort of way ; it does well here in a scree bed. Also in scree soil is *T. polium*, forming a cushion of very woolly grey foliage and yellow flowers. *T. rosmarinifilium* is doubtfully hardy but is a beautiful plant for the alpine house. It is sub shrubby with linear foliage which is almost white in colour and large heads of rich rose red flowers all through the summer. *Senecio uniflorus* is the well known plant of the European Alps, but strangely, not often met with in gardens. It likes a tight crevice and will then make a clump of grey serrated foliage and produce its yellow flowers. *Verbascum dumulosum* is hardy enough for Southern England and makes a splendid pan plant for the alpine house anywhere, with very grey foliage and spikes, about twelve inches high, of rich yellow flowers. Its near relative *V. pestalozzae* is so densely covered with white wool on both foliage and stems that it is best regarded as an alpine house plant, but it also has bright yellow ikes of flowers and is most attractive.

Eyebrows may be raised at the inclusion here of dwarf conifers as silver foliaged plants, but there are one or two forms of the genus abies which would do justice to any collection of "Silvers." *Abies lasiocarpa compacta* is a stiffly erect growing form with stout branches and slightly curved foliage which is very glaucous, blue-grey, and almost white on the undersides. *Abies concolor compacta* is very slow growing with rather long, thin foliage which is very glaucous. It is very rare in cultivation but a most attractive form. *A. nobilis glauca prostrata* is a prostrate form of the Western American "Noble Fir," with curved foliage which is beautifully glaucous grey in colour ; it would make a fine plant to grow over a prominent rock. Finally, I feel bound to note *Picea pungens glauca prostrata*, which is one of the best prostrate dwarf conifers, with foliage of the most beautiful blue-grey which appears brighter still in full sunshine.

May I crave my readers' indulgence for the latitude I have taken in describing plants of so diverse forms of silver. I can only hope that they will prove to be of interest and that some rock garden may be brightened by the inclusion of at least one or more of them.

Seed List Story

(Extract from Letter)

THANK YOU for the most interesting Seed List.

It is all so romantic. Even at a casual perusal I could just visualise an S.R.G.C. gathering : *Penstemon F. Cardwellii*, the tall, angular and rather aloof scholar, not, however, entirely proof to the wily charms of *Veronica MacRantha*, the fabulously wealthy Scottish heiress, whose one fault was her rather lavish perfuming with the exotic "*Nivea*" (*c Bogong H'lands Aust.*—Worth's best). This was perhaps understandable when it is realised that she had to sit next to the somewhat intense *Viola* (*odorata sulphurea*) and opposite *Miss Beveridge* (*Pulsatilla vulgaris*—poor thing). They had all, of course, taken the precaution of being inoculated with *Vaccinium arctostaphylos* to protect themselves against the recent dreadful outbreak of *Scabiosa graminifolia* which, it was rumoured, had been introduced into the country by the sinister *Red Emperor* (cunningly disguised as a Red Emperor). While all these good folk were innocently gossiping about the mating of dear *Dianthus* and the popular "*Little Jock*" and the performance of *Aubretia* as a *bridesmaid* ("again"), the brilliant "*Kid*" *Willi Wormskjoldii* (a young amateur psychiatrist, currently working on the problem of the high incidence of *kaufmanniana* among composers) suddenly exclaimed "*Meconopsis horridula*" as he realised that the apparently simple cup of coffee he had been imbibing was not in fact coffee at all, but *Sarcococca confusa*, the new mescalin-type drug which made everything disappear into a mist of *Lithospermum diffusa Heavenly Blue* (*Cantab.*)—and he was an Oxford man . . .! (What is the meaning of this sinister plot ? Will Dick Barton (Hon. Member S.R.G.C.) arrive in time with his famous family of Archers to save the day ? Do not miss the next exciting issue—look out for "The S.R.G.C. Seed Distribution 1961-62" ! ! Apply early !

J. J. C. C.

Hardy, Terrestrial Orchids From Seed: Some Tentative Suggestions

By JAMES C. ARCHIBALD

OF THE many groups of plants which we are able to grow in our gardens, the family *Orchidaceae* contains, to my mind, more fascinating and beautiful species than any other. To the layman, the name 'orchid' immediately is associated with the tropical Cymbidiums, Cypripediums and Cattleyas, which for the majority of us must remain, standing aristocratic and aloof, in the windows of the florists' shops. To the alpine-gardener, the fine pans of *Pleione spp.*, which have now become rather a cliché on the show bench, or perhaps some of the hardy Cypripediums, may come to mind. Nevertheless, out of approximately one thousand species of the family *Orchidaceae*, which stand a good chance of succeeding in the alpine houses, frames and gardens of us rock-gardeners, only a tiny handful are, or for that matter ever have been, in cultivation.

There is no doubt that many orchids are difficult to grow, but if we are prepared to struggle to grow a plant like *Raoulia eximia*, for instance, which has never looked, even at its best, like anything more than a curiosity in cultivation, how much more rewarding for us it would be to have thriving plants of some of the exquisite orchids of the Southern Hemisphere in our alpine houses. Before we can attempt these species, the first essential is to obtain plants, and there we are faced by a seemingly insurmountable wall. In these days, importation is costly and fraught with many hazards. Even if we can acquire plants from abroad, the difficulty in keeping them is great and the resulting mortality is often high, a discouraging factor. A few firms offer imported roots, mainly from Japan, the Himalayas and North America, but these plants are suffering a severe climatic shock and usually require careful treatment before they flower. In any case, the number of species at present available is comparatively restricted. The obvious answer to all this is to raise the plants, which we want, from seed, and it is in a modest attempt to supply this answer, along with the very complex implications which it must involve, that I offer this article, which is, by necessity, regrettably inadequate.

Before proceeding any further, I should state that I have never raised any species of orchid from seed. Like many other gardeners, I have been deterred from any attempt that I might have made by strange tales of certain 'endotrophic mycorhiza' and weird rumours that have leaked out about "hours dreadful and things strange" involved in the science-fiction-like processes used to propagate the tropical, florists' orchids by seed. It will be of the greatest advantage to anyone contemplating raising the hardy, terrestrial species from seed both to have a rough idea about this technique, used with the tropical species, and to know the reasons which make it necessary.

It is first necessary to understand that the seed of an orchid, any orchid, is different from the seeds of the other plants which we grow in our garden. Whereas with the majority of seeds a supply of food material is stored in the cotyledons, which soon make the fact of germination obvious by their appearance, in the case of orchids the fine dust-like seeds are so small that there is not sufficient room for a food supply. The results of this deficiency are twofold : initial growth is very slow ; special conditions are essential for any growth to take place at all. The time taken before a conventional-looking seedling appears varies between a month and several years. Even then their progress is slow and several years must usually elapse before flowers are produced. A. W. Darnell provides one of the few accounts of the propagation of hardy, terrestrial species by seed, but this, like most available information on this subject, is extremely vague and, I fear, mostly insubstantiated. Darnell makes the following statement : "The various species differ greatly in the length of time they take to form flowering plants from seed, for instance several *Disas* blossom in eighteen months or two years from the germination of the seed, whilst some members of the genus *Orchis* require six or more years to become sufficiently robust to flower." On the surface, neither of these times seem particularly unreasonable, but when we compare the periods which are known to elapse before the flowering of our native British species, we are faced with the possibility that Darnell's times are a gross underestimation. The British spotted and marsh orchids have flowered in 4-5 years from seed ; the native *Ophrys spp.* take 5-8 years ; *Cephalanthera damasonium* 9-11 years ; *Orchis ustulata,* 13-15 years ; *Cypripedium calceolus*, over 16 years. However, the possibility of there being some truth in Darnell's information, coupled with V. S. Summerhayes' statement that "the few examples in which plants have been raised from seed indicate, however, that perhaps the estimated periods of development suggested by some authorities are somewhat excessive," provides a glimmer of hope for us, especially with some of the S. African, S. American and Australasian species about which we know comparatively little.

The fact we know so little about the times taken by the various species to flower from seed is due to the great difficulty in germinating orchid seeds at all. The lack of a satisfactory food supply within an orchid seed makes it necessary for the minute, germinating seed to find its nutrition in another way. This the orchid does by taking part in an association with a mycorhizal fungus. This association is by no means uncommon in nature. Mycorhiza is found in the roots of many woodland plants, forest trees and in *Calluna vulgaris*, the common heather. In orchids, however, it plays an indispensable part in the nutrition of the seedlings and in a few instances even of the adult plants. Mycorhizal fungi are saprophytes, living on the humus in the soil. The association between them and the orchid seedling starts off as a parasitic attack by the fungus, which advances within the orchid until the seedling limits the area of its infection. A delicate balance

between the two is then established, a balance which is continually swaying to either one side or the other. The fungus with a food supply derived from the surrounding soil advances within its host, which then proceeds to digest parts of the invader, thus nourishing the seedling, and so it continues until the tiny mycorhizome, the small subterranean body heavily infected by the fungus, is sufficiently robust to produce a normal-looking green leaf. All this most improbable struggle has, of course, been taking place beneath the surface of the soil and it is only with the appearance of the first leaf that the orchid plant begins to lead a normal life, enabling it to be treated as any other garden plant. The majority of adult orchids are completely free from fungal infection, but a few saprophytic species are dependant throughout their lives on mycorhiza. Fortunately, these species are for the most part of no garden value whatsoever.

Under natural conditions the infection of the germinating seed is absolutely necessary, but it has long been known that the presence of the fungus can be dispensed with as long as the seedling is provided with food from another source. It is this fact which has been much exploited by the growers of the tropical species in the raising of hybrids. In the nineteenth century orchid growers found that success attended their attempts at seed raising only when the seeds were sown at the base of an adult plant, which appeared to be the one place where seed would germinate and grow, but even here pests and harmful fungi accounted for a large number of the resulting seedlings. Then, in 1909, two independent investigators, one in France, the other in Germany, both accounted for this by discovering the presence of mycorhiza. Thereafter, this conclusion was used by several cultivators in developing the 'pure culture' method of sowing the seed on sterilised peat, which had been inoculated with the fungus found in the crushed roots of the adult plants. Although the British grower, Charlesworth, and others used this system with some success, it was wasteful and did little to prevent attacks from deadly fungi and other pests. It was not until 1922 that Dr. Lewis Knudson discovered that the fungus was dispensable and formulated his noted method for germinating and feeding orchid seedlings. The system used by modern growers follows lines similar to those outlined below :

Before commencing sowing operations, hands and utensils are disinfected. Seed is also sterilised by exposure to a solution of calcium hypochlorite, 10 gm. to 140 c.c. of distilled water, for fifteen minutes. Test tubes or flasks are sterilised in an autoclave or pressure cooker at 15 lb. pressure for thirty minutes (see Note 1). The sowing medium is then prepared. Commercial media may be available but I am uncertain. The following formula is very reliable :

Knudson's Solution 'C'

1	gm.	Calcium nitrate, $Ca(NO_3)_2 . 4H_2O$
0.25	gm.	Monobasic potassium phosphate, K_2HPO_4

0.25 gm. Magnesium sulphate, $MgSO_4 . 7H_2O$
0.50 gm. Ammonium sulphate, $(NH_4)_2 SO_4$
0.025 gm. Ferrous sulphate, $FeSO_4 . 7H_2O$
0.0075 gm. Manganese sulphate, $MnSO_4 . 4H_2O$
20 gm. Sucrose
15 gm. Agar
1 litre Distilled water
Add 0.1. normal HCl—sufficient to bring pH up to 4.8 to 5.2.

The agar is dissolved in a little water in a double boiler, stirring to avoid burning. The chemicals are dissolved in a small amount of the distilled water, then added to the rest of the water, to which the agar and sugar are also added, while the whole mixture is kept just below boiling point. After being mixed thoroughly and tested for pH, it is poured with the aid of a funnel into the test tubes or flasks, which are again sterilised in the autoclave. The sterilised seed is now floated on a little distilled water, taken up with a pipette or eye-dropper and scattered over the surface of the medium. A stopper of rolled cotton-wool, flamed to destroy fungus spores, which has been kept in the mouth of the receptacle and removed only to admit the seed, is replaced and the mouth of the flask is wrapped with paper. The flasks are then kept in a temperature of about 70°F. until the tiny roots are around a quarter of an inch long, that is from eight months to a year later. The seedlings are now potted in a mixture of Polypodium fibre and vermiculite, twenty-five to a three-inch pot. Thereafter treatment is no different from that which should be accorded to any delicate seedlings.

Note 1 : K. L. McAlpine in the *Orchid Review* advises adding 1.0 c.c. of hydrogen peroxide C.P. 30 per cent. to 1000 c.c. to the planting medium. This procedure is said to dispense with the sterilising of the seed and the elaborate precautions taken by many growers in addition to the above.

The method outlined in the previous paragraph is obviously beyond the capabilities of most of us. To the uninitiated it reads like something out of Huxley's "Brave New World" and, I must confess, that I feel portions of it might have been written by that estimable Victorian lady, Mrs. Isabella Beeton. However, I considered that it was essential to include it in this article as it offers the only absolutely reliable way to raise orchids from seed. I have no doubt the same procedure could be applied to the hardy terrestrial species and in their case the sustained high temperature would not be necessary for germination. A Wardian case or propagating case in the alpine house would probably offer an ideal position for the flasks containing the seeds. Here is an unequalled opportunity for those members who

either belong to the medical profession or have laboratory facilities at their disposal, to realise that spirit of adventure which is reputed to lie latent in all of us, and break the virgin soil in this fascinating field.

Meanwhile, we less fortunate beings will just have to struggle on in our comparatively crude and unhygienic attempts at raising these perverse and beautiful plants from seed. The system mentioned by A. W. Darnell in his previously quoted book on hardy orchids is worth recounting, although it is a little different from that used with any other plants. Darnell advises sowing the seed on a prepared bed of soil similar to that in which the adult plant grows, but more finely graded and mixed with a little chopped sphagnum-moss in an open position but one away from the direct rays of the sun and covered with a cloche. The bed should be kept moist by spraying with a fine spray until germination takes place, according to the author, from a month to a year later. Thereafter, the treatment is more or less routine : more ventilation is given as the young plant develops ; careful attention is paid to watering ; protection from frost is given during the first winter ; the seedlings are transferred to their permanent positions when they are large enough to handle. However, it is necessary to add that the author does not mention any of his successes and his concluding sentence casts a certain doubt over the reliability of his statements : 'Seeds of those species which grow in decaying vegetable debris should be sown around the parent plant and not in seed beds, as they need the aid of minute fungi to enable them to germinate ; these are found in the soil around the parent plant.' As we now know that every member of the family *Orchidaceae* which has been examined requires 'the aid of minute fungi' to develop into a flowering plant from seed, the present-day reader is compelled to regard the simplicity of Darnell's method with a large amount of suspicion.

Nevertheless, I do not think that the prospect is altogether hopeless for us gardeners who are unable to undertake the raising of seed by the asymbiotic method on agar jelly, and it is in this aura of vague optimism that I offer the following two rather hypothetical and sanguine suggestions. There is an excellent leaflet available through the Seed Distribution in which Mr. A. Duguid describes 'propagation by sphagnum.' This method, which is fully described in the leaflet, making it unnecessary to repeat the description here, has been used with great success in the raising of many seeds often considered difficult to grow and in particular in the growing of Ericaceous plants from seed. As many members of the *Ericaceae* with which this method has been used, like *Diapensia lapponica*, *Cassiope hypnoides* and *Harrimanella stelleriana*, are well-known as indulging in a mycorhizal association, similar to that found in the orchids though probably to a lesser extent, it seems possible that a like method could be used to germinate orchid seed. In the case of Orchidaceae, however, I fancy that more efficient sterilisation of the sphagnum should be undertaken by baking for some time in an oven or by applying the method

used to sterilise small quantities of soil. Neither of these procedures, incidentally, is absolutely fool-proof, as fungal spores possess remarkable powers of survival and anyway the sphagnum is going to become recontaminated on exposure to the air. Before sowing orchid seed in all cases, a simple microscopic examination is advisable, if not essential, to ensure fertility—the dark nucleus is easily discernible—as most orchids have the frustrating habit of producing fat seed pods containing infertile seeds indistinguishable to the naked eye from fertile ones. After sowing, dipping the uncovered seeds in a nutrient solution instead of ordinary water is a possibility. The commercial plant food, 'Phostrogen,' seems to contain everything except the 'body-building' carbohydrates, so the addition of sugar or glucose to it might help it to build healthy baby orchids, as well as, I fear, encouraging the growth of harmful organisms, which could in turn be controlled by the addition of hydrogen peroxide to the solution, as in *Note* 1. But here, I am afraid, I must leave off as my imagination is taking us nearer and nearer to Mrs. Beeton and the complexities of the asymbiotic method.

It would be a far simpler possibility for anyone who already grows hardy, terrestrial orchids to try sowing seed at the base of plants belonging to the same genus as the seed-parent. This, of course, makes the number of species which can be attempted very restricted. Many growers will testify that several species have the welcome habit of coming up in the garden from self-sown seed and seedlings can often be found at the base of established plants. Personally, as a general rule, I do not allow my orchid plants to set seed at all and the old flower-head is nipped off immediately after flowering. I think that this goes a long way in ensuring the next season's flowers and in some cases I believe that it is an essential procedure to prolong the life of the plant. Many tuberous species, particularly belonging to the genera *Ophyrs* and *Serapias* as well as the Mediterranean members of the genus *Orchis*, have tubers of annual duration only and the strain of setting seed frequently prevents a sufficiently robust tuber forming to continue the plant's life. In fact, the great fluctuation in the numbers of certain wild species from year to year to be found in the same locality is due to this tendency towards monocarpism. This failing is particularly notable in several of our native species such as *Ophrys apifera* and *Gymnadenia conopsea*. Here, may I digress for a moment to include a word of what I hope is not redundant advice to any members who are fortunate to possess a plant of the Patagonian *Codonorchis lessonii*, collected by Mrs. Tweedie (there are still one or two in cultivation, I believe, though I was never lucky enough to call myself the owner of one). This extreme fluctuation in the numbers of plants in a single colony in successive years is one of the features of this orchid in the wild state in Patagonia and the Falkland Islands, so it would seem most prudent to remove the old flower-heads as soon as flowering is over ; *if* anyone has been skilful enough to flower it in the first place, that is. This action might help to prevent the habit

of the plant to split up, like *Iris danfordiae*, into many small tubers, which would probably be difficult to bring to maturity, and to check any monocarpic inclinations.

Although I do not allow seed to form on the few orchid plants which I have, late last Spring I noticed quite a number of seedlings in a large pan of that delightful rich Indian-red form of the Early Marsh Orchid, usually found in damp hollows among sand-dunes, *Orchis latifolia* var. *coccinea*. The young plants closely resembled blades of grass and, I must confess, I almost thoughtlessly uprooted them. Anyhow, they progressed well last year and I look forward to their flowering in the future. As to the apparently paradoxical phenomenon of their appearance, the reason is easily explained and the deduction which can be made from it is quite an interesting one. The plants were collected in May 1958, and as they have not been allowed to set seed since their flowering in the wild state in 1957, the seed which produced the seedlings appearing in 1960 must have remained in the soil kept around the roots of the collected plants for at least three years, though when the subterranean processes of germination started cannot be ascertained. The seedlings, while welcome, would have been far more exciting if they appeared in the pans of some of my other orchids, like *Cypripedium macranthum* var. *ventricosum* or *Orchis papilionacea*, which are much more precious and slow of increase than the native species.

It seems unnecessary to the practically minded gardener to go to the trouble of attempting to raise orchid species from seed which are already in cultivation and are known to lend themselves readily to increase by vegetative means. Into this category fall the ubiquitous Pleiones, certainly among the very best of the near-hardy species, which are most gratifyingly easy of increase among orchids. Apart from the fact that in most species the pseudo-bulbs double their number each year, in many, little pseudo-bulbils are produced on the top of the old pseudo-bulb and a few species are so profuse in bearing these that the minute, copiously clustered bulbils closely resemble a miniature version of a Pulsatilla's Struwwelpeter seed head. The occurrence of these pseudo-bulbils and the mistaking of the resulting plants for seedlings led to a large amount of most interesting correspondence in the *Gardeners' Chronicle, Gardening Illustrated* between July and December 1958. This discussion was instigated, by the way, by Mr. Will Ingwersen's remark, referring to Pleiones, that 'it seems impossible to raise them from seeds except on a culture in test tubes.' The writer goes on to add, however, that the tiny pseudo-bulbs, 'if taken as soon as they detach at a touch and dibbled in sandy soil, will grow into pleasing young plants, reaching flowering size in approximately three years' time.' It therefore seems unnecessary for us to bother about growing the cultivated *Pleione spp.* from seed, although fine colour forms might occur, especially from the rich tones of a plant like *Pleione limprichtii*. I also believe that a little work is being, or has been, done in the raising of hybrid Pleiones.

Photo—S. Mitchell

Fig. 27—Pulsatilla vulgaris rubra (see page 247)

Photo—S. Mitchell

Fig. 28—Potentilla nitida (see page 248)

Similarly, species which lend themselves to increase by division of the roots, like the shy-flowering *Bletilla striata* and several *Orchis*, *Calanthe* and *Cypripedium spp.*, would be impracticable from seed, particularly in the Cypripediums. It is far better for us to concentrate our efforts in germinating seeds of the species about which we know so little, as, apart from the fact that there can be a great deal of hope in the unknown, statements that Disas bloom in two years from germination and that the tropical *Phalaenopsis spp.* have flowered in eighteen months are quite encouraging. As to acquiring seeds of these plants, I shall have to leave this to the ingenuity of my fellow members. Many species from the Southern Continents should survive in the alpine house or frame, for whereas they are quite temperature-hardy, in general they could not withstand the alternate freezings and thawings of our soaking-wet winters. Herein lies the failing of several pre-war authors, like Clay, Darnell and Grey, who paid attention only to temperatures in gauging the hardiness of a plant. Quite a few species of orchids are usually available through the Seed Distribution and of course there was that superb offering of seed of some of the Tasmanian *Orchidaceae* in the 1959-60 Seed List. It would be most interesting to see the results of anyone who had *any success whatsoever* with this seed, especially with the Tasmanian material, published in a future issue of the *Journal*. I thought that the following notes on the orchid species, which have been offered in the S.R.G.C. Seed Distribution over the past three years, i.e. from the 1958-59 to the 1960-61 Seed Lists, might be of a little assistance to any member contemplating an attempt to grow hardy terrestrial orchids from seed, as these seem to be the species most likely to occur in future Seed Lists.

Aplectrum hiemale (North America from Quebec south to Carolina, west to Saskatchewan and Kentucky) : about 1 ft. tall ; not a very attractive, purplish-green and brown flowered species, inhabiting the rich soil of deciduous woods ; shy-flowering, even in nature.

Caladenia carnea (Eastern Australia from Queensland to Tasmania) : 1 ft. ; a very beautiful species with large, elegant, pink flowers ; lip, white barred with crimson and tipped yellow ; grows in poor sandy patches in grassland and thin woodland ; cool, sandy soil in alpine house.

Caladenia patersonii (New South Wales, Victoria, South and Western Australia, Tasmania) : 1 ft. ; huge, spidery flowers 5 ins. across, varying from yellow to pink ; lip, yellow marked purple ; usually found in open woodland ; leafy sand in alpine house ; would be a great acquisition.

Calypso borealis (North America from Labrador to Alaska, south to British Columbia ; also Northern Europe) : 4 ins. ; lilac-purple blooms with a wonderfully intricate lip marked deep rose and yellow ; inhabits deep, mossy woods especially of white cedar, spruce and fir ; complete shade in cool fir-needle soil and sand ; one of the most exquisite terrestrial orchids but difficult in cultivation.

Corallorhiza trifida (Northern America, Europe and Asia ; native to Britain) : 9 ins. ; an anaemic-looking, yellowish brown, leafless saprophyte quite unworthy of cultivation and probably impossible in any case ; seeds require the presence of the necessary mycorhiza before even the first stage of germination can occur and the plant is entirely dependent on the fungus throughout its life.

Cryptostylis longifolia (E. Australia from Queensland to Tasmania) : 18 ins. ; quite an imposing plant bearing very curious pale green and mahogany crimson flowers ; it lives naturally in wet places ; should be quite worth cultivating in rich soil, kept moist, in the alpine house.

Cypripedium spp. As *C. calceolus* requires sixteen years or more to flower from seed, at the present this method of propagation is likely to be impracticable for all members of this genus. Division of the rhizome offers the best means of increase, *if* plants can be obtained.

Cypripedium acaule (North America from Newfoundland and North Carolina west to Manitoba) : 1 ft. ; a sinisterly beautiful species with large flowers of greenish brown lined pink ; lip, large, pink shaded red and netted with rose veins ; habitat is in wet sphagnum swamps or strongly acid soil under conifers ; not easy in gardens ; keep wet in Spring, dryish when dormant.

Cypripedium calceolus (Europe and Northern Asia ; doubtful native of Britain) : 1 ft. ; the well-known, chestnut-brown flowered species with a large, rich yellow lip ; grows in calcareous woodlands ; not difficult in limy loam and leafmould.

Cypripedium guttatum (Siberia, Alaska and N.W. Canada) : 9 ins. ; white flowers blotched crimson ; grows at the edges of swamps and in damp patches in birch woods ; not, to my knowledge, in cultivation at the moment, but is certainly well worth growing in cool, birch leaf-soil.

Cypripedium passerinum (North America from Gulf of St. Lawrence west to British Columbia and the Yukon) : 1 ft. ; pale green or white flowers ; lip, white dotted purple ; found in the region of water and in deep, mossy woods, usually associated with conifers ; as the flowers are smallish, this species is not quite so worthy of cultivation as some others in this genus.

Cypripedium spectabile (North America from Newfoundland to Manitoba, south to Georgia) : 2 ft. ; soft, pure white flowers ; lip, pale pink marked with rose ; its natural habitat is in swamps and wet woodlands ; the best-known and most handsome of the N. American species.

Dipodium punctatum (whole of Australia excepting Western Australia) : 2 ft. ; a very beautiful leafless species with large crimson-pink flowers. Regrettably, this is a saprophyte and probably a parasite, growing in moist, sandy soil on the roots of Eucalypti. Darnell suggests planting this at the base of one of the hardy *Eucalyptus*

sp., but I fear that it will always be absolutely intractable in cultivation.

Epipactis pubescens : I think this is a synonym of *Goodyera pubescens*, q.v., but I am not certain.

Gastrodia sesamoides (whole of Eastern Australia) : 1 ft. ; a strange, not unattractive, leafless parasite with bell-shaped flowers, golden brown without, white within ; like *Dipodium punctatum*, I fancy that this will be impossible to cultivate.

Glossodia major (whole of Eastern Australia) : 6 ins. ; a very beautiful little orchid bearing large, solitary, uniform mauve-purple blooms ; common on poor but moist, sandy soil in open country ; sandy loam in the alpine house.

Goodyera pubescens (North America from Quebec south to North Carolina, west to the Mississippi Valley) : 1 ft. ; spike of very small, white flowers ; from dry woodlands under hardwoods, pine and hemlock ; not a very exciting plant, but would be worth growing for the beauty of its bluish-green leaves, which are delicately reticulated with a network white ; probably very difficult from seed.

Gymnadenia conopsea (Europe across Siberia to Japan ; native to Britain) : 1 ft. ; dense spike of pink or lilac-red flowers ; a most attractive native species often found in very large numbers in a great variety of situations ; not demanding of any special requirements in cultivation.

Gymnadenia odoratissima (Western and Central Europe ; very doubtful native of Britain) : 1 ft. ; a slender plant closely resembling *G. conopsea* and from our point of view may be regarded as an inferior form of it ; not difficult in moist loamy soil.

Microtis porrifolia (Eastern Australia and New Zealand) : this is likely to be the plant listed as 'Common Leek Orchid' ; not really worth growing for its long spike of tiny green flowers, but might succeed in rich moist soil in the alpine house.

Orchis foliosa (Madeira Islands) : 2 ft. ; a very robust and specious plant bearing solid spikes of rich-purple flowers over glossy green foliage ; grows by the banks of streams and in other moist places in its native islands ; absolutely hardy and easy in damp rich soil ; will come like some other members of the genus *Orchis* from seed sown around the parent plant but it can be increased quite easily, if slowly, by division.

Orchis fuchsii (whole of Europe ; native to Britain) : 1 ft. ; a member of the old *O.* '*maculata*' aggregate ; a common, variable species usually with pale lilac flowers and spotted leaves ; easy in damp loam ; the 'giant form,' listed this year, sounds interesting and would probably come from seed sown around a plant of the ordinary form.

Orchis maculata : *O. fuchsii*, q.v.

Orchis strictifolia : I regret that I know nothing of this. It may be a synonym or form of *O. latifolia*, though the two names seem to be a direct contradiction of this.

Pleione humilis
„ *maculata*
„ *pricei*
} see previous paragraph on Pleiones.

Pterostylis aphylla (Tasmania) : 4 ins. ; a very curious plant with hooded, 'madcap' little flowers of green and white, stained crimson ; inhabits open grassy spots ; likely to be worth growing in moist, sandy loam in the alpine house.

Pterostylis parviflora (whole of Eastern Australia) : 6 ins. ; pale green flowers shaded with brown ; found in shady, sandy places ; possibly not so worth while as the above, but should merit growing in the alpine house in a damp mixture of sand and leafmould.

Thelymitra spp. : possibly the finest of the Australasian orchids, which are likely to be near-hardy in Britain. Three species were included in the 1959-60 Seed Distribution, two of them unnamed. All members of this genus are beautiful plants worthy of cultivation, with flowers varying from yellow to blue, through purple to pink and red.

Thelymitra pauciflora (whole of Australia and New Zealand) : 1 ft. ; a variable and exquisite plant with large, regularly shaped, purple-blue flowers ; it occurs in several situations, but generally in damp, open, grassy locations ; moist, sandy loam in the alpine house.

The real answer to the complex problem posed in the raising of the hardy terrestrial orchid species from seed can only be supplied by those gardeners who are both courageous and willing enough to undertake this uncertain task. For their benefit, I append a list of species which I think would be worth attempting to cultivate in this country. Some are only suitable for cultivation in frames or the alpine house and it would be advisable if all the Southern species were collected at a high altitude. I did not include any Himalayan or European species as these may be more easily obtained as imported tubers ; nor are there any orchids listed which grow within Communist occupied territories, as these will probably remain unobtainable for some time. Finally, then, may I wish anyone trying to grow these very worthwhile plants from seed the very best of luck and end with the confession that I think that I shall *still* try to obtain tubers of these plants before attempting them from seed.

* * *

PATAGONIA AND THE CHILEAN ANDES : *Asarca glandulifera, A. acutiflora* ; *Chloraea alpina, C. aurantiaca, C. aurea, C. bergii, C. campestris, C. chica, C. cholilensis, C. chrysantha, C. crispa, C. crocata, C. cylindrostachya, C. discoides, C. ferruginea, C. grandiflora, C. homopetala, C. hookeriana, C. incisa, C. lagunae pacis, C. nervosa, C. leucojiflora, C. longipetala, C. magellanica, C. multiflora, C. pencillata, C. philippii, C. phoenicea, C. piquichen, C. rypalo-*

glossa, C. semibarbata, C. speciosa, C. xerophila ; Codonorchis lessonii, C. poeppigii, C. skottsbergii.

FALKLAND ISLANDS : *Chloraea falklandica, C. gaudichaudii ; Codonorchis lessonii.*

NEW SOUTH WALES, VICTORIA AND TASMANIA : *Acianthus caudatus, A. exsertus, A. reniformis ; Bulbophyllum elisae ; Caladenia carnea, C. caerulea, C. clavigera, C. congesta, C. deformis, C. latifolia, C. filamentosa, C. menziesii, C. patersonii, C. testacea, C. suaveolens ; Calochilus campestris, C. paludosus, C. robertsonii ; Corysanthes fimbriata ; Cryptostylis longifolia ; Diuris longifolia, D. maculata, D. palustris, D. pedunculata, D. punctata, D. sulphurea ; Eriochilus aphylla, P. curta, P. longifolia. P. obtusa ; Thelymitra antennifera, T. aristata, T. carnea, T. cyanea, T. flexuosa, T. ixioides, T. longifolia, T. macmillanii ; Chiloglottis diphylla, C. gunnii.*

JAPAN : *Calanthe torifera ; Cephalanthera chloidophylla, C. elegans ; Cremastra mitrata, C. unguiculata ; Cypripedium thunbergii ; Dactilostalix ringens ; Orchis cyclochila, O. matsumurana ; Pogonia japonica.*

NEW ZEALAND : *Acianthus oblongus ; Caladenia lyallii, C. minor ; Chiloglottis bifolia ; Corysanthes macrantha, C. oblonga, C. rivularis, C. trilona ; Lyperanthus antarcticus ; Thelymitra pulchella, T. uniflora.*

ORANGE FREE STATE : *Brownleea monophylla ; Disa fragrans, D. frigida, D. thodei ; Disperis fanniniae ; Eulophia sankeyi ; Huttonaea grandiflora ; Neobolusia virginea ; Satyrium woodii.*

TRANSVAAL : *Brachycorythis pubescens ; Brownleea coerulea, B. nelsonii ; Disa aconitoides, D. laeta, D. cooperi, D. macowanii ; Disperis anthoceros, D. fanniniae, D. nelsonii ; Eulophia aemula, L. bakeri, E. engleri, E. rehmannii, E. stenantha ; Habenaria schlechteri ; Herschelia baurii ; Satyrium neglectum ; Stenoglottis fimbriata.*

NATAL : *Disa cephalotes, D. chrysostachya, D. nervosa, D. oreophila, D. patula, D. pulchra, D. rhodantha ; Disperis allisonii, D. anomala, D. bicolor, D. concinna, D. flava, D. kermesina ; Eulophia calanthoides, E. inaequalis, E. subintegra ; Huttonaea pulchra, H. fimbriata, H. woodii ; Satyrium sphaerocarpum, S. woodii.*

BASUTOLAND : *Brownleea recurvata ; Disa cooperi, D. porrecta ; Eulophia robusta.*

CAPE PROVINCE : *Bartholina pectinata ; Ceratandropsis grandiflora ; Disa capricornis, D. crassicornis, D. draconis, D. glandulosa, D. longicornu, D. macowanii, D. montana, D. marlothii, D. porrecta, D. racemosa, D. sanguinea, D. uniflora ; Disperis oxyglossa ; Eulophia aculeata, E. barbata, E. hians, E. violacea ; Evota bicolor ; Herschelia charpentieriana, H. graminifolia, H. lugens, H. multifida, H. purpurescens, H. spathulata ; Monadenia comosa, M. ophrydea ; Orthopenthea elegans, O. minor, O. richardiana ; Pterygodium catholicum ; Satyrium carneum, S. cordifolium, S. coriifolium, S. cristatum, S. macrophyllum, S. maculatum, S. membranaceum, S. princeps, S. sphaerocarpum ; Schizodium clavigerum, S. obtusatum.*

NORTH AMERICA: *Arethusa bulbosa*; *Calopogon pulchellus*; *Calypso bulbosa*; *Cypripedium candidum, C. hirsutum, C. montanum, C. planipetalum*; *Orchis rotundifolia, O. spectabilis*; *Habenaria blephariglottis, H. ciliaris, H. cristata, H. dilatata, H. fimbriata, H. integra, H. leucophaea, H. nivea, H. peramoena*; *Pogonia ophioglossoides.*

Alpines in Dry-Stone Walls

By C. E. DAVIDSON

THE GROWING of alpines and other plants in dry-stone, retaining walls must be nearly as old a custom as gardening itself. Nevertheless, it is surprising to see how often only the top of the wall is used, while many better places remain uninhabited. The reason usually given for this lamentable nudity is the difficulty of establishing plants in an existing wall. The idea is, of course, to have the wall planted as it is built, but it is not necessary. Unless large, square stones only have been employed in the making—and they do present a problem—it is almost always possible to ease out a small stone here and there without causing collapse of the structure. Having achieved this, a wise gardener will, before proceeding further, take a watering can and make certain that water applied from above is able to reach the place where the roots of the plant will rest. Sometimes this has to be done from the top of the wall. It is not a good plan to water directly into the hole before replacing the stone, as the soil gets washed out of position. The back of the hole is filled in with a suitable compost, bearing in mind that a more retentive mixture than usual will be appreciated in this vertical position. If the hole is too small to admit hand or trowel, a long-handled spoon, such as a basting-spoon, is satisfactory. Great care should be taken to make sure—by prodding with a blunt stick—that no cavities have been left, and that the roots can eventually spread into the soil at the back of the wall. The plant is then laid on the stone forming the floor, with ½ in. or so of compost below it. It is better, for rebuilding purposes, to keep the neck of the plant well to one side of the hole—the roots, of course, can stretch back into the middle. If the floor-stone has an outward, downward slope, it is important to correct this by laying a flat stone on it to give a slight inward, downward tilt, which will prevent the compost from running out. The task of patting compost round the roots—with the back of the spoon, if need be !—and filling up the rest of the hole requires patience. It is probable that the stone originally taken out will no longer fit, and one with less depth and width will have to be substituted; also, air spaces round the neck of the plant, and gaps left between stones should be filled in with small stones, firmly wedged.

After a thorough initial soaking, no further watering has ever been necessary in this garden (average annual rainfall 38 ins.), even in long dry spells. Shortias, Ramondas and other moisture-loving plants in walls with N.E. and N.W. aspects came through the drought summers of 1955 and 1959 without discomfort—which is more than can, in many cases, be said of the denizens of peat walls. As a well-known rock-gardener remarked recently: "Nothing could be drier than dry peat."

Another advantage of stone-wall planting is that protection can also be given against excessive moisture by arranging an over-hang. Petiolarid Primulas seem to like this treatment, and look charming against a background of stone. It is difficult to divide them, however, in such a position. Another plant tried in a wall as an experiment was a small specimen of Androsace imbricata. It had been badly attacked in the alpine house by green-fly, and had never recovered. On the principal of kill or cure, it was placed in a S.E.-facing wall with an overhanging stone above, where it has lived for two years, and is now in the best of health.

There is no end to the experiments that might be made in this line. Whether it be a cool wall for shade-lovers, or a hot wall for sun-lovers, here they can enjoy perfect drainage, combined with the moist root-run so greatly appreciated by the majority of alpines.

Of This and That

By "PIERRE"

"I have a garden of my own,
But so with roses overgrown,
And lilies, that you would it guess
To be a little wilderness."

Andrew Marvell

"If the roses that endure for but a day wrote histories, they would say: We have always seen the same gardener; in the memory of roses none has been seen but he; he has always been the same as he is now; assuredly he does not die like us, he does not even change."

Fontenelle

"Na, na," answered Andrew, "I took care o' that; it wad ill hae set me, that am an artist and half a scholar to my trade, to be fighting amang a wheen kilted loons that dinna ken the name o' a single herb or flower in braid Scots, let a'be in the Latin tongue."

Sir Walter Scott

WHOM DOES TIME GALLOP WITHAL ?

I was planting a shrub in my front border when the little girl leant her bicycle against the wall and gazed at me solemnly as I worked. Some time elapsed and then my fork impaled a clump of daffodil bulbs and brought them to the surface. "What are those ?" asked the little girl. "Daffodils," said I. "Ah, yes," said she, "I have seen those daffodils come up all over your garden year after year." "How many years exactly ?" said I, curious to know how far back in her six or seven years she could remember. "Oh, well, last year anyway," said the little girl. "Are you the gardener, or do you live here ?" "I am the gardener, *and* I live here," said I firmly. Then as the shades of winter night began to fall, "Don't you think your mother will be wondering where you are ?" "Oh, no !" quoth the little girl with a superb unconcern that made me think that the next generation of teenagers would also be a formidable one, "Oh, no ! She won't begin to worry until five o'clock."

LAWRENCE—A FIVE-LETTER WORD

My next door neighbour, as I think I have mentioned before, is very proud of his turf, and so a few months ago, seeing in the list of new Penguin books one that I thought would interest him, I entered one of Glasgow's best-known bookshops and said to the assistant : "Can I have the new Penguin book about *Lawns* ?" "T. E.!" said the girl, at the same time shooting at me a glance highly charged with suspicion. I confess that my brain raced furiously for several seconds before it clicked into gear, and I retorted : "No, nor D. H. neither !"

"PLANT IT IN A MAASS, MISSIS"

My mother once had an ancient gardener who regarded her doings with an amused and tolerant eye, and so was willing to fall in with her ideas where another gardener might have done his best to obstruct them. One of his favourite sayings as he followed in her wake, plodding on his flat splay feet, was : "Plant it in a maass, missis ; plant it in a maass."

This is a saying that I have recently been remembering and acting upon with what seems to me excellent effect. And so this year when I produced a huge crop of *Campanula carpatica* from my own seed, I said to myself : "This may be a common and easy plant unworthy of a true rock gardener's attention. Still, I think that a few dozen plants of it in one large patch will look mighty fine." So I planted them in a "maass" seeing visions of delight next summer. But alas ! some weeks later when I went to have a look at them, the vision I saw was a few bare stalks standing up like stricken trees upon a blasted heath. The slugs had got 'em. They had gone to the grave *en masse*.

"C'EST MAL ORGANISÉ . . ."

It was in a paragraph in *Le Monde* that I discovered the magic phrase. The writer said : "I had in my company a corporal who when

things were going badly—persistent rain, or an enemy bombardment more intense than usual, or simply time going past too slowly—would grumble into his whiskers : 'Rotten management ! rotten management !,' thus putting the blame squarely upon Divine Providence.'' And so now when I am confronted with such a gardening catastrophe as I have just recorded, I no longer use language that makes my wife wonder if after all I am very nice. I merely mutter into my mustachios : ''C'est male organisé ! C'est mal organisé.''

But when we lived in Dunblane we had a gardener who had an even more satisfying phrase. I very seldom saw him, because I left in the morning before he arrived and came home long after he had departed. This made things rather difficult, because my wife found it impossible to understand what he said. However, she had been trained in phonetics, and would sometimes record his remarks for me in phonetic script. It was thus that I learned that his invariable reply to any remarks upon the vileness of the weather, or upon the maleficent work of rabbits, voles, moles, bullfinches, etc., was : ''Haud yer tongue, wumman ! Haud yer tongue, wumman !''

PESTS

This garden of ours in Dunblane was really extraordinary. It had everything in the way of pests, with club root to boot. But when I came back from holiday and found a roedeer in the garden, I thought that this time it was the END. After panting vainly after it for some time, I telephoned my neighbour, a sportly old boy, and said hopefully : ''What do I do about a roedeer in my garden ?'' ''Oh, you'll just have to try to chase it out,'' and before putting down the receiver he added : ''Whatever you do, don't shoot it, or its eyes will haunt you till your dying day.'' I had no wish to end my days like the Ancient Mariner, so I went back to the garden, faint yet pursuing. Fortunately just then my gardener hove into sight and between us we chased the roedeer down to the bottom of the garden where it launched itself over the four-foot fence with exquisitely easy grace. ''It's a good thing,'' said I, ''we got it before it had eaten up the whole vegetable garden.'' ''Haud yer tongue, man,'' said Mr. Herd.

THE LITTLE GENTLEMAN IN BLACK VELVET

But I got my own back on my next door neighbour a little later. I was looking disconsolately at the yellowing haulms in my pea-rows which showed where the moles had charged through leaving the roots dangling, when he passed down his avenue and stopped to talk. I told him my trouble, but said that I had been reading in a gardening book that moles are not really pests and that one must not on any account trap the little fellows. The thing to do, the book said, was to drop a little bit of calcium carbide into their run. This would do them no harm, but the fumes would make them retire hastily into one's neighbour's garden. My neighbour gave me a nasty look before continuing on his way.

GENTIANA, THE FLOWER OF DUNBLANE

But I did have one joyful experience in that Dunblane garden. When we left Glasgow, my mother lifted her clump of *Gentiana acaulis* and told me to take the accursed thing with me and see if it would flower in Dunblane. In the turmoil of settling in, I hastily shoved the clump into the sodden clay of my new garden and promptly forgot all about it, for I wasn't at that time interested in alpines. And lo ! in the spring came the flowers like great blue trumpets blown by seraphs to herald some divine apocalypse. But the last trump sounded when I left Dunblane, for back in Glasgow never a flower have I seen. The plants merely dig their toes in, and to all my blandishments reply obstinately : "No, no ! it's no use ! it's no use ! we can't do it here !"

THE DESPERATE BATTLE

It was in that Dunblane garden that I learned just how desperate a battle gardening in Scotland can be. Gardeners in Scotland are apt to think of their garden as Glasgow people think of the Clyde. It is all their own work. Whereas gardens in England are merely plots of that garden that God Almighty first planted in Eden. I remember once on a walking tour coming at nightfall to a little pub that nestled at the foot of the high ramparts of Camelot in south Somerset. They gave me a meal when the inn was cleared at ten o'clock and then they led me upstairs to a vast feather bed. To quote from the finest account of a walking-tour that was ever written : "The Pilgrim they laid in an upper Chamber, whose window opened towards the Sun rising, the name of the Chamber was *Peace*, where he slept till break of day, and then he awoke and sang . . ." After breakfast, mine host took me round his garden in that bright luminous freshness that is so lovely in England in the early morning before the full heat, and it was when I saw that semi-tropical lushness, cucumbers sprawling over the path, tomato plants bending under the weight of fruit, that I realised that here was something quite different from gardening in Scotland.

THEY DON'T KNOW WHAT THEY'RE MISSING . . .

On another hiking tour I was climbing the main Chichester road on to the top of the Downs when a cyclist whizzing downhill stopped to ask me the way to Petersfield. When he heard my voice he just about embraced me. He came from Aiberdeen, he said, and was farming near Bognor. Said I : "I like the look of these Southdown sheep." To which he replied : "Ach man, yer haun's never oot yer pocket feeding them." I said the farms in Sussex seemed to have much better equipment than in Scotland. "Aye, it's because the Sussex men won't work !" And so on and so on he criticised poor silly Sussex in every detail. But with one foot on the pedal just before resuming his career downhill, he let the cat out of the bag : "Ach,

man, it's an awfu' peety mair Scotsmen don't come down here. They don't know what they're missing !''

Perhaps it may be because of this climatic handicap of ours that rock-gardening is so popular in Scotland—not just because we have plenty of rocks, but because in the cultivation of some alpines at least we have fewer difficulties to contend with than our rivals in England.

''LET A' BE IN THE LATIN TONGUE''

My wife and family heave weary sighs if they ask the name of a flower and I reply in the Latin tongue instead of the vulgar. Nor are they greatly interested when I explain that botanical Latin is an international language which enables addicts in one country to understand what those in aother country are talking about. Just as the hero of a John Buchan romance, at one of the customary moments of imminent and deadly peril, is able to save the situation by speaking to the aged Greek priest in the hashly assembled shreds of his schoolboy Latin. Not all of our members could save their lives like this. I remember one of them pointing out to me in his garden a plant he had just won in a Club draw. It was labelled *Calluna vulgaris alba*, and he was surprised and just a little disappointed to learn that it was white heather that he had acquired unawares.

BLACK AND WHITE

The Editor's recent appeal for black and white photographs brought to my mind the forgotten fact that once in the far-away-and-long ago, I won a prize from a gardening paper for a black and white photograph. I won the prize with a photograph of my mother's garden taken from the dining-room window. The photograph was impressive, because behind my mother's garden stretched the vast nursery gardens and bosky hillocks of the Bellahouston Park, and in the photograph the intervening road was invisible. I titled this vast prospect ''A corner of Mrs. —'s Garden in Dumbreck,'' and I think it was well worth the eight shillings and sixpence which it won.

The thought of the illimitable pleasances of that photograph, stretching out beyond the middle distance to the unutterably far away, recalls an idea that visits me from time to time while I am listening to lectures at the Club, or when I am looking at the illustrations in the more gorgeous type of gardening book. This idea which keeps haunting me is that while it is extremely delightful to attend lantern lectures about gardens on the grand scale, with woodland vistas and poolside dells, and immense himalayas of rockwork, all inhabited by plants of an almost incredible beauty whose names one scribbles in one's notebook in the dark and cannot decipher when one comes upon them in one's pocket a few weeks later, yet it might be refreshing to have more often something which would be of more immediate practical interest to the suburban gardener of quarter of an acre or less.

I have found in the books of Mr. L. S. Hills several ideas of great practical interest to the smaller alpine gardener. One of them, the solid bank of helianthemums, I have tried out on a small scale and found most effective—although its flaw for the business man is that its full glory has not arrived when he leaves in the morning and has departed when he comes home at night. But what springs to my mind as the perfect example of what I want is the article in which our President a few years ago described what he made of his Edinburgh front garden. Here was something grandly conceived, and boldly carried out, yet on a comparatively tiny scale.

THE SARCOPHAGUS GARDEN

So what about it, Mr. Editor ? Why not start a competition for the best and most exciting plan for a suburban garden of ordinary shape and size ? I shall be glad to offer a prize of one gross seedlings of *Meconopsis cambrica*, or three dozen seedlings of *Campanula carpatica* (before the slugs get them next year !), or one dozen ditto *Aethionema schistosum*.

I shan't, of course, enter for the competition myself, and the photograph which I enclose is not to be taken as anything but a dreadful example of how not to make a wall garden. When I had finished it, it was immediately and by common consent christened the Sarcophagus Garden, and visitors were to be observed tiptoeing respectfully past it (see Fig. 29).

For a year or two I found it a useful place (in spite of excessive drainage) to grow some of my tinier treasures, but last autumn my wife decreed that she could stand it no longer, and so, obedient to command, I razed it to the ground. Where it was I have planted "in a maass" polyanthus, and cowslip, and oxlip, and primroses, and *Meconopsis baileyii* and *grandis* and primulas *sikkimensis*, and *bulleyana* and *florindae* and *denticulata alba*, and white foxgloves and *Campanula persiciflora*, and *Polemonium cashmirianum* and at one end one of my propagations of *Potentilla fruticosa veitchii*, a favourite plant of mine. At least it should be a more light-hearted place this year, even if I have changed from the gem-like treasures to jewels of a more gaudy and barbaric splendour. But other ideas will be gratefully received in case I want to change again in another year or two ! For such bold changes are the spice of gardening life.

News From Estancia Stag River

(Extract from letter to Editor from Mrs. Ruth Tweedie, Argentina)

We can pick up the overseas news of the BBC about twice a week, and we always seem to hear that the weather is bad. Here, too, we have had exceptional weather and half the *annual* rainfall of 12 to 15 inches in the last ten weeks. November gave us only one and a half days without strong cold wind, and the wind with brilliant scorching sunshine made everything very dry in spite of showers at night. This was fine for using colour film in the 16 mm. ciné camera, but for black and white it meant that the aperture was perpetually stopped down to 16 with a Plus X film. We ought to have chosen a slower film, I suppose, but I had forgotten the strange combination of strong cold wind and blinding sunshine. On the longest day, December 21st, it was bitterly cold, and the 4000 ft. Range quite white down to 800 or 900 feet. And on Christmas Day the temperature scarcely rose above 40°F.—although when the wind dropped in the evening we managed to have an "asado" and roasted a lamb on a spit in front of a larger open fire. It stays light here until nearly 11 p.m. And January has been wetter than ever—nearly 2½ inches in 12 days and several snow showers. Meanwhile the coast area of Southern Patagonia has had terrible wind and drought, as nearly all *our* rain comes from the west. On the east coast they have had to kill lambs to save the ewes as there was so little water and the grass all burned dry. The dust here has made the clip very dirty and the sheep difficult to shear.

From my point of view the weather has been a mixed blessing. Still photography has been almost impossible and ciné photography fairly difficult. Flower has been abundant, and the flowers large and highly coloured. In many cases the flowering period has been greatly extended, for instance *Calceolaria darwinii* is still in bloom after starting in early November. One great difficulty is that because of the weather I haven't been able to get up to the high pampa and through the forest to the top of the Range as much as usual. And I have missed seeing the peak of perfection in some of the flowers. For instance, *Embothrium coccineum* flowered nearly three weeks earlier than three years ago, and was finished before Christmas, which was sad because it makes a lovely decoration. And the lovely snowdrop orchis—*Codonorchis lessoni*—was quite over when I got up to the forest (*Nothofagus pumilis*) to photograph it. But *Cruikshanksia glacialis* has been absolutely superb up on the high screes. It is scented like "paper white narcissus" and a small mat of flat bright dark green rosettes the size of half a crown throw up a golden sheet of sessile flowers with inch long corolla tubes. It is a tiny gem. One still day, it scented the whole air.

The most dramatic new plant I have found this trip has a hideous name, *Anarthrophyllum desideratum*. I only hope we can get it into cultivation because here, in the wild, it has all the virtues. I collected a small quantity of unripe seed of it three years ago, having heard that

it was "Scarlet gorse," and I think Jack Drake has one plant. I found it this year growing on and around the base of two volcanic rocks (which are great 1000 ft. land marks, and look very like the Bass Rock and Ailsa Craig) half way between here and Rio Gallegos. It is like a cushion plant of grey spines, growing very symmetrically about 4 ins. high and 4 to 12 ins. across. Each small branch bears an upstanding flower of tawny orange or scarlet, sometimes an inch in length. Again I missed the peak of the flowering when the whole rock must have looked as if it were on fire ; but I found plants high up on the S.E. corner (the coldest, because we are in the southern hemisphere) and also in the rough grass round the base of the rock. I hope to collect seed soon—and I hope to enter it as a flowering shrub in the Edinburgh Show in 1964 ! I think it will need a great deal of sunshine, and will resent both pampering and also winter damp. It has a very long tap root, like a great many plants in this cold, windy and sunny climate.

Instead of drying out and dying down at the end of December, *Oxalis laciniata* has continued in leaf up to the present, and the tubers are fat and healthy. It has made collection easier, because their condition improves as autumn approaches, and usually by this time they are invisible because the leaves have died. I think it is still my favourite flower here—with its surprising look of fragility in this fierce climate. The scent of a quantity of flowers is very sweet. Every colour seems to have an individual scent : vanilla, a touch of aniseed, the smell of lemon flavoured Edinburgh Rock—in fact I think *all* the different flavours of Edinburgh Rock except ginger ! I have so many enquiries, even forwarded to me here, about its cultivation that I must include a note about it for the *Journal.* From my own experience in E. Scotland I find that it thrives in a very open mixture such as ½ coarse sand, ¼ loam, ¼ leaf sifted mould. If one wants it for a Show, pot it up in October when its leaves have died down. Keep it dry and cold until February or March, and after that keep it moist until autumn again. Leaves and buds begin to appear in March. The flowers will only open in a certain minimum temperature, but this *need* not be from sunshine on the Show bench. It is absolutely 100% hardy—as is everything else from this latitude in Patagonia with temperatures ranging from below zero F. to a rare 65°F. or 70°F. The stony loam in which it grows here seems to warm up quickly from the sun, and the air temperature may be only 40° or 45°F. in the shade, but the Oxalis unfurls its trumpets of purple, blue, lilac, crimson or very pale colours as it grows on the E. or N.E. (the sunny) sides of hills and gets warmth from the sun and the sun-warmed soil. It grows amongst short grasses, *Calceolaria darwinii, Viola microphylla, Berberis empetrifolia, Adeomia pumila* and other tiny plants. I have never found it in anything but well drained soil. I have had it growing in the open ground in Dirleton on the E. Coast of Scotland for six years completely unprotected, in a scree, a trough and in sandy loam. Last year the sparrows were very vicious in picking off the young buds as they first appeared like tiny

beads—but they were particularly bad about all plants at that time. I plant the tubers horizontally—about 1 in. to 1½ ins. below the surface —just as they grow in nature. If I am planting in 4 in. pots for showing, I put several pieces into one pot (perhaps six or eight after the October dividing) and they increase about four-fold. They put up flowers and leaves only from the very pink growing tip of the tuber.

I have heard the faintest rumours of (? Rosulate) violas growing 100 miles north of here in the Cordillera, the foothills of the Andes. At least the manager of another Estancia told me that 10 years ago he had seen "cactus plants with little flowers between the leaves." Perhaps he was only trying to please me, but no straw is too thin to clutch. He also told me that I should have to ride (or walk) two or three leagues to reach the area as there was no track for the truck. I am so possessed with a desire to find it that I have firmly ridden a little more every day, until yesterday I was five hours in the saddle helping to gather sheep. The horse is very kind, and I only hope he wasn't as stiff as I ! And now, of course, the truck is in Rio Gallegos where repairs must be slower than anywhere else in the world. And another goal is the Lago Argentino, where there are *Mutisia* spp. and other good plants to collect. It should be good for photography, too, as there are glaciers and the beautiful colourings of snow and ice. I believe one of the glaciers is the only one in the world which is increasing in size and it encroaches on the forest on the other side of the lake and pushes down the trees.

I am very much looking forward to the Conference next Spring. It's very stimulating to hear so many people from other countries and to listen to new points of view. I only wish I were either a botanist or a horticulturalist instead of only someone who has been to Patagonia, as I would like to be able to make a greater contribution. The more work I do here, the less I seem to know, and the greater my wish to have some experts near. I don't think we can appreciate at home how lucky we are to be able to get someone's advice or opinion at a moment's notice. There is a kind of mental loneliness in these wild places that even I forget when I'm at Dirleton, and I long for a good argument about plants with Mrs. Boyd Harvey !

Extract from letter to General D. M. Murray-Lyon :

I AM HAPPY to know the little box of plants arrived in good condition. Regarding the *Dicentra canadensis*, they had already "shot" long before I uprooted them. [This in reply to a remark that the tubers of *Dicentra canadensis* had "shot" or sprouted before arrival.] Both this one and *D. cucullaria* corms lie about on the surface of the woods fully exposed after the lashing summer rains beat the soil off them. This makes them easy to locate, as *D. cucullaria* corms burn to a bright coral pink from the heat, and *D. canadensis* develop shoots in

early fall all ready to thrust through the blanket of fallen leaves, which is about all that covers them throughout the severe winter, unless they get an additional covering of snow, such as we are having this winter. At present the woods are six to eight inches of snow deep, and there has been no thaw since the first snowfall last December.

Indiana, U.S.A. D. E. WATERSON

Plant Notes

CELSIA ?

IN THE September issue of the *Journal* there was a note on a plant of *Celsia roripifolia* from S.R.G.C. seed.

I also had seed of this name, but my plants are different from those described ; being annual, with rough green leaves and a single stem with side shoots. The flowers are the same. My 1960 plants came from self-sown seedlings, and were not fussy in cultivation.

Can any reader give its correct name, please ?

Surrey. I. M. D. L.

CLEMATIS ALPINA

THOSE PEOPLE whose experience of clematis is limited to those rampant climbers which scramble all over high trellises or over the roofs and chimneys of two storied country cottages may be rather taken aback to hear of a clematis recommended as a good rock garden plant. More than one of the family, however, qualifies for this definition.

Clematis alpina (or *Atragene alpina*) is certainly a trailer or climber like most of its brothers and sisters, but on a very modest scale, seldom reaching six or seven feet even with support and more usually only about half this. In nature it is usually to be found trailing over a boulder or through some dwarf or carpetting subshrub near the edges of pine woods of northern Europe and Asia ; a form of it is also found in North America.

Conditions similar to those it chooses in the wild are not difficult to provide in a rock garden ; the plant illustrated (fig. 30) is growing through a mat of *Veronica cupressoides variabilis*, while we have others on creeping junipers, compact dwarf shrubs, and hanging over rocks. In every case, however, the clematis was planted on the north side of what was to act as its host so that the roots and base of the plant were shaded from the sun. The nodding flowers, blue or violet blue, are carried singly on four-inch stems, but over the plant as a whole are borne in great profusion and form a delightful picture. *Clematis macropetala* can only be described as an equally worthwhile sister species from China, while we also grow in the rock garden the North American *Clematis scottii*.

St. Andrews, Fife. J. L. M.

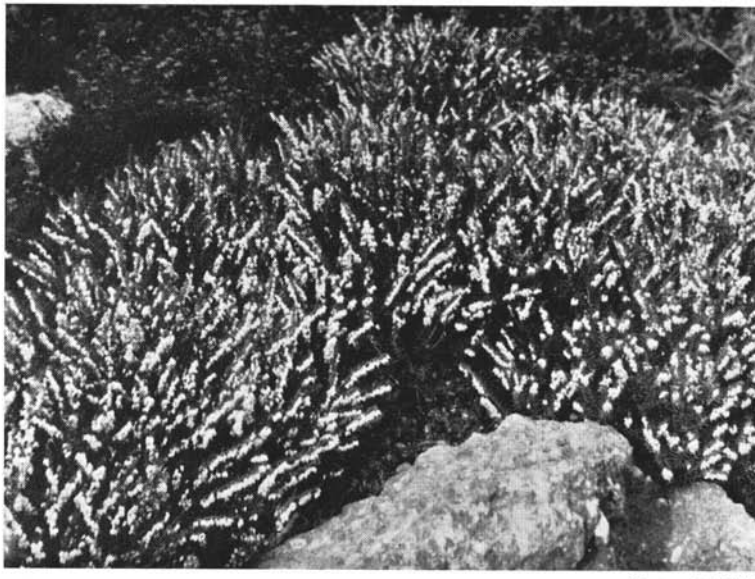
Photo—"Pierre"

Fig. 29—The Sarcophagus Garden (see page 240)

Fig. 30—Clematis alpina (see page 244) (*from colour*)

Photo—D. Wilkie

Fig. 31—Erica carnea vars, Springwood Pink and White (see page 253)

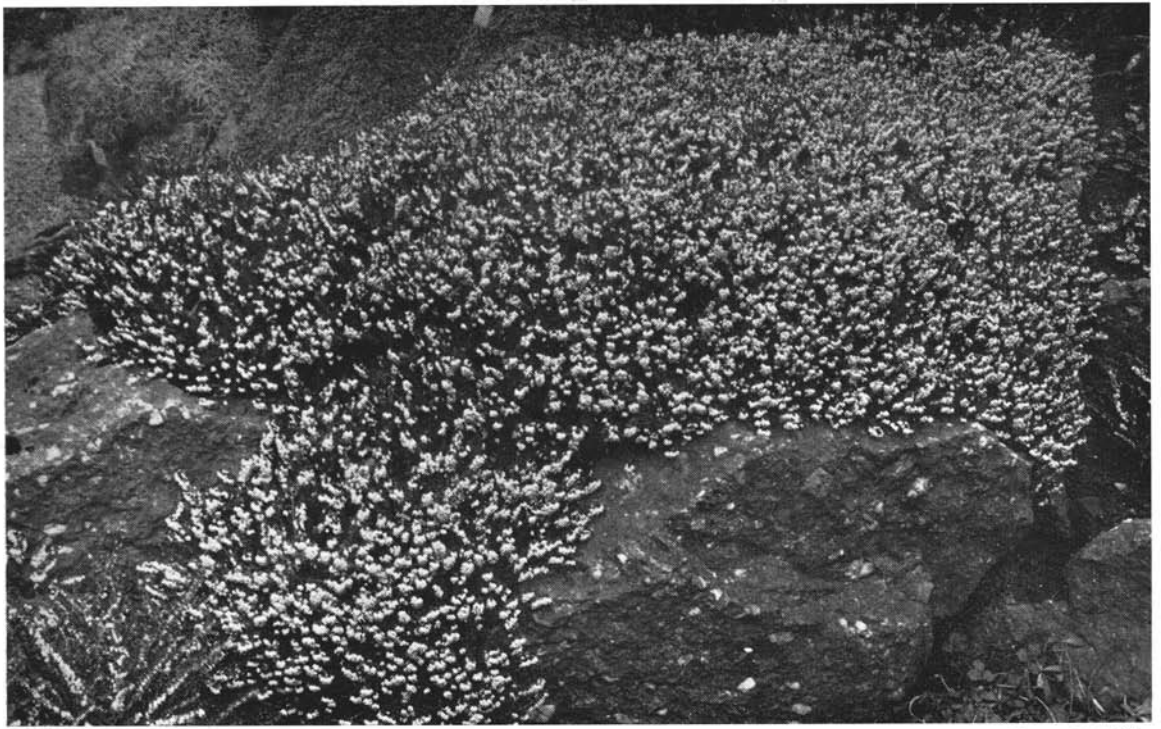


Photo—D. Wilkie

Fig. 32—Erica mediterranea Silberschmelze (see page 254)

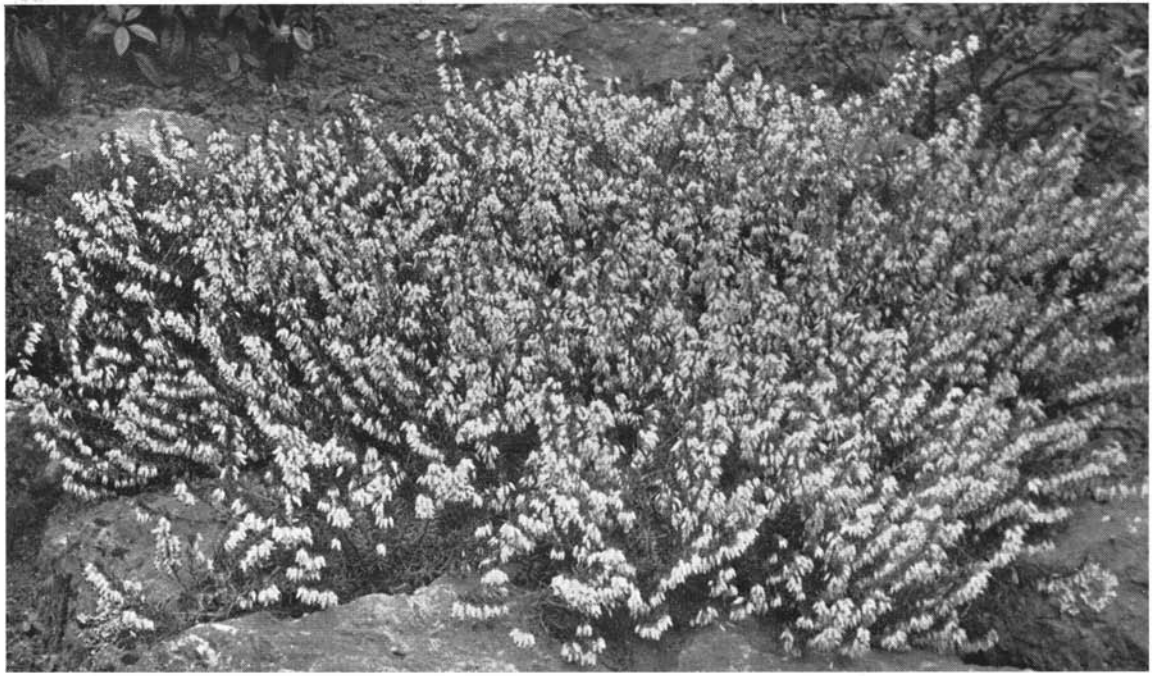
Photo—D. Wilkie

Fig. 33—Erica vagans var. (see page 255)



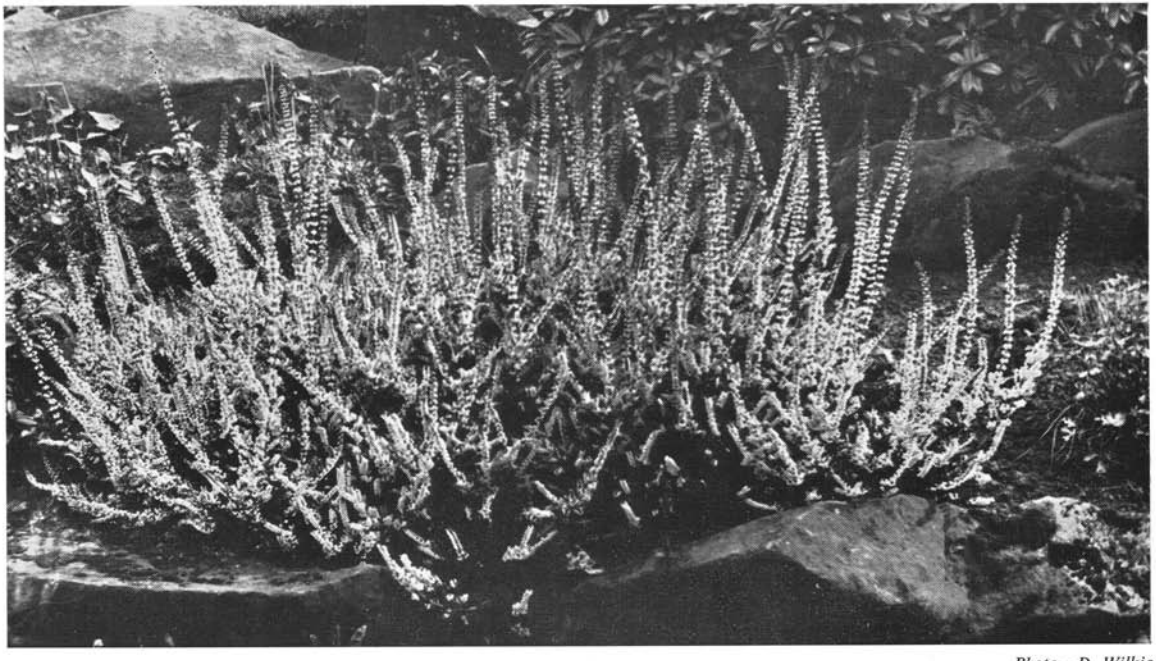
Photo—D. Wilkie

Fig. 34—Erica carnea Winter Beauty, photographed on Christmas Day (see page 253)



Photo—D. Wilkie

Fig. 35—Erica carnea Springwood White (see page 253)



Photo—D. Wilkie

Fig. 36—Calluna vulgaris H. E. Beale (see page 236)

CYPRIPEDIUM MACRANTHUM var. VENTRICOSUM

EARLY LAST Spring I potted up a fine, sturdy-looking root of this orchid, with all the care deserved to such a rarity. My efforts were well rewarded by the result and just in case this handsome Oriental decides to leave the confines of my tiny garden-frame so that it may return, in spirit if not in body, to the more spacious slopes of Nippon, I feel that a brief note on this plant, which has not been seen in Britain for about half a century, to my knowledge, would not be out of place.

The nomenclature of the *Cypripedium macranthum* (or *macranthon* —one name seems as good as the other) group has always been in a highly confused state. The plant which I have in my possession at the moment is, however, almost certainly that which is most graphically described and illustrated in Farrer's "My Rock-Garden" as *C. macranthum* var. *ventricosum* and is probably the one which is to be found elsewhere under the name *C. ventricosum.* Whatever it may be called, it is without doubt one of the finest of hardy, terrestrial orchids. In fact, I have little hesitation, for once, in siding with 'that great Cham' of rock-gardening (if I may misquote Smollett's often misunderstood reference to Dr. Johnson), Reginald Farrer, when he writes that 'far away above *C. reginae* stands *C. ventricosum.*'

Very soon after I had potted my precious plant in a friendly mixture of heavy loam, sand, gravel and leaf-soil, I was delighted by the prompt appearance of a plump and promising, pale green shoot, from which the plaited, downy leaves of fresh and delicate green cord-velvet quickly unfolded themselves. Then, one day, I noticed, away down among these leaves, a firm, green bud securely ensconced. Was it going to turn brown and shrivel, like the buds on my plant of *C. japonicum*, or would it develop into a perfect and glorious flower? Day by day the tiny knob began to swell until, quite suddenly, I was confronted with, not a poor, aborted bud, but a large bloom of one of the finest orchids which I have seen.

Cypripedium macranthum ventricosum has the largest flowers of any of the hardy Cypripediums in cultivation and probably of any hardy species whatsoever, with the exception of *C. tibeticum*, a wonder-lurid-flowered dwarf from the bleak Tibetan moorlands which I hopelessly long to have. The bloom on my specimen was well over four inches across and the lip was two and a half inches long. This fine size is coupled with a number of other desirable attributes, not the least of which is exquisite colouring. The petals, sepals and lip are all of a similar, rich and dusky shade of subtle rose-pink, imperceptibly dappled and intricately veined with a deeper tone of crimson. Over and above this, to quote from the masterly pen of Farrer, 'the petals of *ventricosum* are long and undulating . . . and give a solid brilliance of grace to the flower; while the dorsal, instead of being squatty, is tall and waved and pointed, with a swollen pouch of the right proportion and design, rather obese than starved.' The total height of my plant was but ten inches and the complete impression

was one of infinitely graceful, artistic proportion. The whole plant has a fascinating, almost sinister, beauty about it and, when compared to it, *C. reginae* looks like a rosy-cheeked, comely, buxom wench from the Allegheny Mountains alongside the subtly sinister and sophisticated beauty of a Japanese Lucrezia Borgia,

Midlothian. JAMES C. ARCHIBALD

DIANTHUS NEGLECTUS

IT IS a well known maxim that one should exercise caution in buying dianthus plants, particularly of species, because of the great variation to be found from good to 'decidedly not so good' forms. To none does this apply more than in the case of *Dianthus neglectus* (fig. 25) which at its best can be one of the finest of all rock garden plants and at its worst one of the most disappointing—straggling in growth and with thin-petalled, washed-out flowers.

A native of the mountains of Switzerland and S.W. Europe, it grows from a strong central main root in a dense mat of fine, narrow, linear leaves which are almost indistinguishable from those of the fine grasses among which it is found growing. The flowers are usually solitary on short, erect stems of from two to five inches, but are produced in great profusion and in colour range from pink to rich crimson, but all showing that characteristic buff reverse ; they are rather more than one inch across.

It is usually accepted as a general rule that all or nearly all dianthi are lime-lovers, but *Dianthus neglectus* is an exception in preferring a lime-free soil.

OMPHALODES CAPPADOCICA

AN OLD and long grown favourite of the rock garden which still holds its place in face of the keen competition of many more recent introductions is *Omphalodes cappadocica*, or *O. cornifolia* as it used to be known (see fig. 26).

This lovely blue-flowered plant of the family *Boraginaceae* can cover quite a patch of ground by means of its creeping, underground rhizomes, and seems to do almost equally well in either full sun or partial shade—a dry rock wall, or on the north side of a rock. Its basal leaves, grouped in tufts, are ovate and about three to three and a half inches long, cordate at the base. The upper leaves on the erect or ascending six- to eight-inch stems are progressively much smaller.

The gentian-blue flowers, each about one third of an inch across, are arranged in loose graceful racemes, and have quite a long season lasting from spring well into summer. Even when the flowers are over there is something attractive in the shade of green and the shape of the leaves themselves that makes *Omphalodes cappadocica* a pleasing companion to its neighbours in the rock garden.

PASQUE FLOWERS

PASQUE FLOWERS, so named because they were at one time used for dyeing Easter eggs, must be among the longest cultivated plants of our rock gardens, and even now the many other new introductions since they were first grown have not robbed them of their popularity. In fact one might safely say that they have never been more popular than they are at present ; so much so that many catalogues list quite a number of colour forms and varieties of *Pulsatilla vulgaris*. Over the years their botanical naming has dithered between *Pulsatilla* and *Anemone* but the present trend seems to be to give them generic rank as *Pulsatilla*, and certainly to the ordinary grower of plants they would appear sufficiently distinct from other anemones to justify this.

Pulsatilla vulgaris, found locally on dry, grassy hillsides of eastern England from Yorkshire southwards, is widely distributed through hilly limestone regions of Central and Southern Europe and Western Asia, usually found growing in sunny and fairly dry sites on firm, grass covered ground. Its wide distribution has led to considerable variation as already mentioned and though the form illustrated is *P. vulgaris rubra* (see fig. 27) all the variants are attractive. There is variation in height, too, from the twelve to fifteen inches of *P. vulgaris rubra* to the dwarf and compact six to eight inches of *P. v. coccinea* or "Mrs. van der Elst."

Another good rock garden pulsatilla is *P. alpina*, with white or white flushed violet flowers, but even better is the rich sulphur yellow variety of it, *P. alpina sulphurea* ; both are strong growing plants, often going to fifteen inches in height. *P. halleri* is another strong growing plant from Central Europe, with broadly divided very silvery, hairy leaves and long stemmed deep violet flowers ; contrary to most pulsatillas this one does not like lime.

Pulsatilla vernalis, of which there is a fine illustration in *Journal* No. 16 of April 1955, is a high alpine found in widely scattered parts of Europe, its white or violet tinged flowers apparently sitting almost stemless in a nest of several coarsely cut leaves closely adpressed to the ground or sometimes carried on short stems rising a few inches above the leaves.

This does not exhaust the list of pulsatillas species, but it probably covers sufficient of the most desirable to give an attractive and interesting selection for most rock gardens.

POTENTILLA NITIDA

THERE ARE certain plants which, in spite of long years of popularity and cultivation in many gardens throughout the country, are still somewhat of a mystery as regards their requirements to bring them to full and regular flowering. The classical example of these 'thorns in the flesh' is undoubtedly *Gentiana acaulis*, but many will assert that *Potentilla nitida* runs it a close second. In both cases plants can be grown quite easily but the successful regular flowering of them is quite another matter.

Writers and nurserymen's catalogues all recommend a starvation diet for *Potentilla nitida* (see fig. 28), but many rock gardeners insist that they have followed this recipe to what they regard as the limit of reasonable safety with no appreciable gain in the regularity and freedom of its flowering. Fortunately one seldom hears of any keen grower quite giving up the struggle ; even without flower the lovely silver-grey foliage of the plant easily earns it a place in the most exclusive rock garden collection, and there are few plants which do not regularly produce at least a sprinkling of handsome pink flowers an inch or more across.

Potentilla nitida is found widely distributed over the high mountain limestone regions of S. and S.E. Europe. It may be in the crevices of limestone rocks and cliffs or carpetting gravelly screes, but seldom if ever away from limestone areas. From a hard, woody, central tap root it spreads out over rock face or scree surface in a wide flat carpet comprising a dense network of creeping woody twigs hidden by a mat of silver-grey usually three- but sometimes five-parted palmate leaves which barely rise two inches from ground level. The large, rich or pale pink flowers are carried either singly or in twos on short, erect, three-inch stems and in a well grown specimen can almost hide the silver leaves beneath them. Full sun and a place in good deep limestone scree is probably the best method of cultivation for them in the garden, but very obviously any suggestion of rich feeding is to be avoided.

SAXIFRAGA BIFLORA VAR. MACROPETALA (OR ALBA)

THIS VARIETY of *S. biflora* is, like the species, found only at very high altitudes in the Alps. It is a much rarer and more interesting plant. We first saw it last summer on the Col de l'Iseran (10,000 ft.), where it was growing in wet shale beds recently released from snow, but always in a raised position, clear of running water. There appears to be some confusion about the name. Hegi refers to it as *S. biflora var. macropetala* ; the R.H.S. Dictionary lists it as *var. alba.* It is interesting to note that the latter—inclined to be sparing with praise—describes it as "good." Without being a raving beauty, it is a curiously arresting and attractive plant. The dark green, red-tinged leaves are slightly succulent, and form basal rosettes. Trailing red stems, about 4 ins. long, set with pairs of leaves, bear large, solitary, terminal flowers. These are of a rather impure white, but greatly enhanced by prominent, bright red stamens.

Of the two plants brought home, one was placed outside in scree, but did not survive the excessive rains of the autumn. The other is in a pot in the alpine house, and has come through the winter in a fairly healthy state. Should *S. biflora var. macropetala* prove amenable to cultivation, it is certainly most worthy of a place in the rock garden or alpine house.

West Linton, Peebles-shire. C. E. D.

THREE TIPS FOR GARDENERS

I HAVE met many people lately who have never heard of the boiling water method for moving plants, and I thought a note on the subject might be useful to other gardeners.

If you have to move a plant which you think might resent disturbance or when replanting after exhibiting at a Show, dig your hole and pour in a kettle of boiling water and, when the water has subsided but while the steam is still rising, put in your plant and cover in with soil ; in this way the roots will benefit from the warmth of the steam till the plant has recovered from the shock of the move.

I have tried this method with success on tap-rooted plants which had completely wilted in the post, and on a full grown pear tree which was moved in full leaf, and which bore a good crop of fruit that same year, after the move. A hot-water bottle to the feet for shock after an accident !

* * *

An inexpensive way of completely ridding a plot of ground of bishop's-weed (ground-elder), is to cover it with lawn-mowings all the summer whenever you see a blade of the weed showing ; this will burn it off and you will have no more trouble from it. Of course, the ground to be treated must be free of garden plants, but the grass-mowings will not harm dormant bulbs or shrubs. This is a useful method of cleaning the roots of a weed-infested hedge.

* * *

We have been troubled like many other people by sparrows spoiling the flowers of polyanthus, yellow crocus, and kabschia saxifrages, by tearing the blooms to pieces, and we have found 2 or 3 short stub wires pushed into the middle of the plant with 1½ inches of wire above the plant will give the birds a fright when they knock against the wires, and they will leave the flowers alone.

Coldingham, Berwickshire. M. L. H.

Heathers

By Dr. JAMES DAVIDSON

The Clark Memorial Lecture for 1961

THE WISE old saying that familiarity breeds contempt is applicable, among other things, to an appreciation of the beauties of nature. The rich autumn purple of our moors and hills of Scotland and the north of England may hardly be noticed by large numbers of the population, whilst still fewer people really look at heather more intimately, or take any interest in it. Certainly, the thought of lucky white heather appears to be more stimulating to the masses. At times we see branches of purple heather attached to the radiators of cars, a somewhat similar sight to the large bunches of the Alpenrose which are so frequently seen scattered about the roads in alpine regions of the continent. A large plant of heather—the bigger the better—is frequently pulled out by the roots, and plunged into the garden at home, where of course it immediately succumbs. As a result of this experience, it is often said "We cannot grow heather in our garden. We have often tried, but it always dies."

Heathers are, of course, amongst the most easily grown of all plants, provided a modicum of simple common sense is applied to their culture, and attention is paid to a few fundamental necessities for their successful growth. On the whole, they do not care for lime, except in the case of *Erica carnea* and its varieties, which flourish in a limey soil. Heathers are frequently said to be labour saving, but it has to be remembered that when the plants are small weeding must be done as usual if they are grown in ordinary ground. Trimming after flowering is beneficial, as this helps to keep the plants in good shape, preventing certain types from attaining a straggling growth. When they do attain a good size and cover the whole of the area, no weeding is required, as weeds are quite unable to grow under a thick mass of heath. A valuable feature of hardy heaths is the fact that the number of species and their varieties suitable for growing in this country is such that it is possible to have a continual show of bloom, and thus they are always with us as the seasons change from January to December.

The size of the garden is of no great consequence. Heathers can be grown just as successfully and look just as pleasant in the small back or front garden as they do in the large garden. In fact, one would particularly recommend them for the small garden, where the owner often has neither time nor money to spend on his garden.

With regard to sites, it is of primary importance that heathers must have full exposure to open sunlight and air. Let us think of them in their natural habitat on the open moor and hillside, where there is not even a tree in sight. We must try to remember this when planning their position in our garden. There is one possible exception,

and that is the accommodating species *Erica carnea* which, in addition to not objecting to the presence of lime, does not object to partial shade from trees. Slopes facing west or south are particularly good. If the projected area for the making of a heather garden is flat, an attempt should be made to form an undulating surface, which gives effect and added interest to the heath garden as a whole.

Heaths have, in addition, considerable use as an edging to borders. In my opinion, they are particularly attractive when growing at intervals along the edge of an herbaceous border. Well grown plants look very effective when arranged in this way along the side of a garden path. They can also be planted as an edging to shrubberies and rhododendron beds.

Steep slopes are a difficulty, where cutting the grass is laborious and becomes impossible as age advances ! Heathers may be planted *én masse* in such a position, producing a permanent and most pleasant landscape effect. On the other hand, if there is longish grass, beds may be made in which solitary plants or groups can be planted. Heather growing amongst grass on a bank in this way can produce a most pleasing combination.

Careful consideration should be given to the growing of heaths in the rock garden. Undoubtedly they can, and do, contribute greatly to the all-round effect. They are admirable plants to intersperse amongst the normal alpine population. They blend well with the stone and varied colour of their alpine neighbours. I must, however, add a word of warning. Our rock gardens vary in size. In the larger rock garden, heaths are admirable when suitably distributed, but in the small rock garden care should be exercised. Certain heaths, if the soil and position in which they are growing suits them, may reach a size rather out of proportion to the other inhabitants, as well as to the rock garden itself. In other words, they may tend to crowd out, and eventually obliterate the other plants. Apart from height, certain species and varieties may spread as carpets over a large area, unless carefully controlled. Consequently, consideration should be given to the growing of dwarf forms, which do not take a great deal of room. Amongst such types may be mentioned *Calluna vulgaris nana compacta*, *Cc. v. foxii nana*, *minima*, Mrs. Pat, Mrs. Ronald Gray, *pygmaea*, and the quaint little variety, Sister Anne. This last is, as a rule, not a profuse flowering type, but its habit and foliage, especially in winter, are rather beautiful. Varieties of *Erica carnea*, *E. tetralix*, *E. cinerea*, *E. ciliaris* and *E. vagans* are perfectly suitable for medium sized or large rock gardens.

If, however, enthusiasm is such, beds can be made to contain nothing but heaths, and colour schemes carefully arranged. Such beds look well anywhere. The interspersion of other members of the Ericaceae with heathers is admirable. Dwarf Rhododendrons, *Arctostaphylos uva-ursi*, varieties of Andromeda, Cassiope, Gaultheria, Kalmia, Pernettya and Phyllodoce, to mention a few, all mix

well in a heather border. The grouping of allied species in this way tends to add still further to what is already of considerable interest and beauty.

In the preparation of the soil for heaths, it should be remembered that they are easy to grow. They do perfectly well in ordinary soil, or a medium loam. If the soil is poor, peat should be added ; similarly, peat should be mixed with a sandy soil. A lime-free soil, as already stated, is necessary for the culture of the majority of heaths, apart from the varieties of *Erica carnea*, *E. mediterranea* and *E. darleyensis*. However, if lime has been added to the ground some three years before planting, this does not appear to be a serious problem—in fact, the soil will have been improved. It is when the soil is naturally calcareous in substance, and from which lime cannot be completely removed, that the situation is serious. Callunas and varieties of *Erica cinerea* and *E. tetralix* will not tolerate lime-containing soils under these conditions. Rich soils and manures are to be avoided. Stiff clay is an abomination to heaths, as their fine roots cannot penetrate it. Peat does not generally appear to be a necessity, as they grow quite well without it, but wet peat mixed with the soil, or heaped round the roots at the time of planting, or as a top dressing in spring is of benefit. It seems to act as a tonic. It is also good to mix amongst the roots when planting in a dry soil.

The best time to plant is April and May, preferably April. October and November are alternative months, but at this time there is the possibility of early frosts. Plant deeply with the foliage resting nicely on the ground. Beginners are apt to leave too much of the stem above ground, with a resultant ungainly, straggling growth. Always give plenty of room if possible—about 18 ins. apart is a good average, but less would do.

Propagation is simple. This may be made by seed, cuttings or layering, the two latter being, of course, more rapid. Cuttings may be taken in April or May, or July and August. They should be about ½ in. to 1 in. long, and consist of soft unflowered stems of the plant. I carefully remove the lower leaves with a safety razor blade for about two-thirds of the length, and insert the cuttings in a mixture of equal quantities of ordinary sand and finely sieved peat. I have found that this mixture will give 100% take. Layering can be done in the spring, or at any time, except when there is frost.

The genus Erica consists of about 700 species, 600 of these being localised in the Cape region of S. Africa. This is really the home of heaths, very many beautiful species being amongst them, including a yellow-flowered species. They are, of course, not hardy in this country, but many of them are seen as pot plants in the shops at Christmas. It has been thought that the genus may have had its origin in tropical Africa. There are a few species growing on the mountains of E. Africa, which appear to form a link with those in the Mediterranean region. Be that as it may, six species have reached the British Isles—*Erica*

tetralix (Crossleaved Heather) ; *E. cinerea* (Bell Heather) ; *E. ciliaris* (Dorset Heath) ; *E. vagans* (Cornish Heath) ; *E. mediterranea* and *E. makaiana*, the latter two being present only in Ireland. There is evidence that our Scotch Heather (*Calluna vulgaris*) reached S.W. England in the late glacial period.

We as gardeners take a considerable interest in the varieties of heaths and heathers. The majority of these varieties have been found growing in the wild by enthusiasts who spend their time searching the hills and moors. Others have arisen as chance seedlings in nurseries. We may therefore say that they are all natural hybrids. If a chance find of a variety out of the common is made, it is often a large plant, which may be practically impossible to lift, or if lifted and transplanted would in all probability die. It is very much better to take cuttings from the original find, which can always be visited for further cuttings if necessary.

Let us now look at some varieties as they appear in bloom throughout the year. The earliest to appear, and one might say the hardiest, is *Erica carnea* (The Mountain Heath). This is not a native of Britain, but is distributed over a wide range in the alpine regions of Europe. This species will survive through the most severe conditions, and appears to be indestructible. It might be said that the harder the conditions, the more vigorous its growth. There are many varieties, possibly the earliest to come into bloom being "Eileen Porter." Flowers of a carmine colour appear as early as December and January ; in fact, in certain areas it is in bloom in November, and will continue until April. "Queen Mary" runs very close to it with regard to being the first to bloom. The flowers are of a good pink. Another very early flowering variety is "Winter Beauty" (fig. 34), whose deep pink bells are delightful to see when surrounded by snow. "King George," which appears later, about March, is one of the best of the Carneas. It is extremely floriferous, with deep rose-crimson flowers, and should be in every collection. Another good variety is "Vicelli," which is somewhat different from the others, having an interesting foliage, reddish or bronze in winter and darg green in summer. The beautiful white flowered "Soringwood" is a great favourite, and again a "must." This, in my opinion, is one of the finest of all the heaths—an early flowering plant which is covered with distinctive, large white flowers, tipped with brown anthers. It is not tall-growing and can cover a moderate area without looking untidy. It is a joy to see its pale green foliage, and masses of flowering spikes when the snows melt. This and "Vivelli" were found in Italy. There is also an attractive pink form, "Springwood Pink" (figs. 31 and 35).

When March arrives we find another species, *Erica mediterranea*, and its varieties, coming into flower, and they are with us until May and June. This is an interesting plant. It does not occur on the shores of the Mediterranean, as the name suggests, but is found in Portugal, N.W. Spain and S.W. France. It also occurs in quantity in a few local-

ities on the west coast of Ireland, where it frequently attains a height of 6 ft., and extends practically to the sea shore. There, it comes into flower much earlier than in our gardens in Scotland. Up to date, I have found the Irish form to be perfectly hardy in a comparatively high (1050 ft.) exposed garden. It has blue-green leaves and pink flowers. One of its varieties is "Silberschmelze" (fig. 32). This is a more low-growing form with pleasant white flowers. Another variety which I greatly admire is "W. T. Rackliff." This, I should say, is one of the most beautifully shaped heaths which I know. It has a compact growth and large pure white flowers evenly distributed throughout the bush, which can reach a height of 2 ft. This, too, is perfectly hardy.

In June, we notice the flowers of our Bell Heather (*Erica cinerea*) beginning to appear, also the Crossleaved Heath (*Erica tetralix*). These species are, of course, well known, and have a number of varieties, especially with regard to *E. cinerea*, which show considerable colour variation from shades of pink, dark red, or scarlet to rich purple. To mention only a few, *E. cinerea* "Eden Valley" should be grown because of its unique appearance. It is a low-growing type, about 6 ins. in height, and produces lilac-pink flowers, the pink fading gradually until the lower part of the bell is white. "C. G. Best" is a good form, with a pleasing shape, and salmon-pink flowers amongst dark green foliage. This is one of my favourites. Another is *E. cinerea coccinea* "Smith's variety," which is a real dwarf, being only 3-4 inches high. The flowers are a beautiful deep carmine-red. An interesting white form is "Domino," which can be completely covered with white flowers bearing minute black anthers.

There are not so many varieties of *Erica tetralix*. The one I would place above all others is *E. t. alba mollis*. This really is an outstanding plant. The flowers are pure white and the leaves have a silvery tone, particularly in the summer. Another outstanding feature is the length of the flowering period, which extends from June to October, or even later. This is a variety which should be grown in every suitable garden. "Con Underwood" can also be recommended. Here we have another variety with silvery foliage, but with crimson bells.

Closely related to *Erica tetralix*, but a distinct species, is *E. mackaiana*. This is of considerable botanical interest, as it is found only in an area of two square miles in a wild part of western Galway, and in one small area in Donegal. The headquarters of the species is in northern Spain. It is a pleasant little plant, with bright pink bells and, in my experience, is easily grown in our cold climate. A double form has been found which is also of easy cultivation. Up to date I have found both types to be quite hardy.

Another beautiful heath which is native to Ireland is the Connemara Heath, or St. Dabeoc's Heath—*Daboecia cantabrica*. It is found growing in considerable quantity in W. Galway and Mayo, and has become naturalised in several places in Great Britain. Its distribution abroad is in N. Portugal, the west and north of Spain and S.W. France

(Basses Pyrénées). In Ireland it is frequently found growing through a dwarf whin, *Ulex gallii*, and through *Calluna vulgaris* which support the weak straggling stems of the *Daboecia*. In our gardens the growth is much more robust, and no external support is required. The leaves are almost white on the lower surface and dark green above. They vary from ¼ in. almost to ½ in. in length and are about ¼ in. in breadth. The flowers are large and egg-shaped, about ½ in. long and rose-purple in colour. A variety, *Praegerae*, has beautiful large bright pinkish flowers. There is another variety, *D. c. bicolor*, which has a mixture of purple and white bells. *D. c. alba* is very beautiful, but possibly not so hardy as the purple form. St. Daboec's Heath reaches a height of about 2 ft. and, whether growing wild or in the garden, is an amazing sight.

It is of considerable interest as to how these heaths, *Erica mediterranea*, *E. mackaiana* and *Daboecia cantabrica* could have reached Ireland, this being the only area in these islands where they occur. They belong to the Hiberno-Lusitanian group of plants, having originated in the Iberian Peninsula. They are no doubt amongst the oldest members of the Irish flora. It is thought that they may have migrated northwards in pre-glacial times along the western European coast-line.

In June and July the Dorset Heath (*Erica ciliaris*) appears in bloom. This species does not possess many varieties, but all are good and have large flowers of pure pink and rose shades. To mention a few, there are *E. ciliaris globosa* ; *maweana* ; and "Mrs. Gill." On the whole they are perhaps not quite so hardy in exposed, hard climates, but, personally, I have found the white flowered type, *E. c.* "Stowborough," perfectly hardy under these conditions. This last, and those already mentioned, distinguish themselves by flowering over a long period from July to October, the white form flowering well into November.

The Cornish Heath (*Erica vagans*) and its varieties are most striking and should be in every garden (fig. 33). They come into flower in August and continue until October. They are exceedingly hardy, being able to put up with any climate, and will even tolerate the polluted atmosphere of large industrial towns. They are excellent in foliage, habit, and flower and average about 18 ins. in height. They flowers are produced at the end of the branches in long racemes, and open and fade in sequence from the lower part of the raceme to the tip. The most outstanding variety is *E. v.* "Mrs. D. F. Maxwell," which should be the first to be obtained. It has beautiful long spikes of cherry-pink flowers. "St. Keverne" is good and has somewhat paler flowers. "Pyrenees Pink" flowers until late October. A lovely white flowered form is "Lyonesse," which should be planted beside "Mrs. D. F. Maxwell," as they make a splendid show together.

There are a number of hybrid heaths, two of which I would particularly like to mention, namely, "Darleyensis" and "Dawn." The former is a cross between *E. mediterranea* and *E. carnea*. It is extremely hardy, grows rapidly and produces its pale rose-purple flowers from

January until April. "Dawn," a fine hybrid between *E. ciliaris* and *E. tetralix*, has large, deep-rose flowers which last from June until October, and is most floriferous.

And now we come to *Calluna vulgaris*, our Scotch Heather, or Ling, as it is called in England. This the true Scotch Heather, not *Erica cinerea* or Bell Heather, which was so designated some little time ago in a certain gardening journal. It differs from the other heaths in that the colour of the flower is due to the large calyx, which almost entirely conceals the corolla. There are many varieties of Calluna, some of which are amongst the most beautiful of the heath family. It is not possible to mention them all, but there are a number to which I would wish to draw attention. *Calluna v. coccinea* has deep crimson flowers and is low-growing, being about 9 ins. high. An old favourite, and one of the best, is "Alportii," with its rich crimson flowers. It develops into a rather tall bush, sometimes about 3 ft. high, and looks well on a bank or in the centre of a heath bed. "C. W. Nix" is also good, being rather similar, but it does not assume such a height, at most about 2 ft., and is perhaps more graceful than "Alportii." "Mullion," with deep pink flowers, is a favourite of mine. It is rather low-growing (about 9 ins.). It should be planted in a sheltered position, as it is apt to be cut back in a severe winter. *Hibernica* is more hardy and has the distinction of coming into flower in October, when the other heathers are practically over. It continues in flower during November and often well into December. The last Calluna of all to bloom is *hyemalis*, which may last even longer than *hibernica*.

The double varieties of Calluna, with their rose-like flowers, are invaluable, and should be in every collection. There is the excellent "Tib," which has the distinction of having been found on the Pentland Hills. The flowers are somewhat smaller than the other doubles, but are of a rose-crimson shade and very prolific. "County Wicklow," "H. E. Beale" and "J. H. Hamilton" should all be grown. The first is the most prostrate and is covered with shell pink flowers. "H. E. Beale" (fig. 36) is one of the choicest of all heathers, producing long, graceful spikes with an abundance of pale pink flowers. This variety also retains its colour for many months when cut in full bloom and placed in a dry vase, not too near a window. "J. H. Hamilton," with its bright salmon-pink flowers, is somewhat different from the other two. A recent introduction, "Peter Sparkes," with similar rose-like flowers, is quite outstanding, and may well excel the others.

There are a number of varieties of white Calluna, apart from the ordinary white type which is frequently found on the hills. I personally favour *C. v. pyramidalis*, because of its pleasant habit. As the name suggests, it has a neat, compact form of growth, tapering up to a point, and long flowering stems. It is about 2 ft. high and is one of the later varieties of heather, being in flower with me until November. My favourite white, however, is the double form, *C. v. alba plena*, an excellent, showy plant when covered with its white double flowers,

which are larger than the single types. It is a profuse flowering heather, as a rule, but sometimes is not quite so floriferous after a very dry summer. The height is about 18 ins. and it produces a spreading type of growth which is quite rapid. This heather was found in Germany before the last war. It should be grown by everyone interested in heathers, but a word of warning must be given. At first the flowers appear to be single, causing profound disappointment to the purchaser. In a short time, however, all is well, as double flowers completely cover the plant.

Before leaving the *Callunas*, I should again like to mention the dwarf forms, which are so useful for planting in the rock garden. The most delightful of all is little "Sister Anne" (*C. v. hirsuta compacta*). This grows slowly, retains a perfect habit and a height of only 2 to 3 ins., having branches which grow horizontally. The leaves are a rather silvery grey, but in winter they are definitely bronzed, producing a beautiful effect during the dull months in the rock garden. It is not a profuse flowerer as a rule, being better in some years than others. The flowers look very charming lying amongst the foliage. Quite apart from a general collection of heathers, "Sister Anne" should be in every rock garden, and is especially suitable for the smaller garden. Another prostrate type, growing about 1 in. high, is "Mrs. Ronald Gray." *Foxii nana* and *foxii nana compacta* are also useful for rock garden planting. The latter has a small, roundish, compact growth which is covered with bloom, and looks particularly attractive in the small rock garden. It is sometimes called the "pin-cushion heather."

I have intentionally omitted to mention the different varieties of tree heaths, as I consider they are outwith the scope of this lecture, being more suitable for large gardens where they can have ample space for their display.

Finally, I should like to remind you of the economic value of our Scotch Heather (*Calluna vulgaris*). Apart from the popularity of cut sprays of lucky white heather, which produces quite a lucrative business now-a-days, it is of considerable value with regard to the shoots of young heather as food for sheep and grouse. It is also used in certain districts for thatching and the making of brooms. Then, of course, there is the production of heather honey. It is said that in the past dim ages, the Picts brewed a powerful drink from it, known as Heather Ale. Unfortunately the recipe was irretrievably lost, as is so perfectly described by that great gardener and naturalist, the late Sir Herbert Maxwell, Bart., of Monreith in Wigtownshire. He tells us in one of his many books, "Memories of the Months," 4th Series, how, when the Picts were finally defeated by the Scots invaders from Ireland, they were driven into the promontory of the Mull of Galloway, where all the survivors—men, women and children—perished, apart from a father and his three sons, who still held the enemy at bay, inflicting considerable slaughter. This was the family who were the hereditary

custodians of the secret recipe for the making of heather ale. The Irish king was particularly anxious to obtain this, and knew that the father and his sons possessed the secret. Hunger finally forced them to surrender. When they were brought before the king, the father said he would not live to witness the dishonour of his race, and asked that he and his two younger sons be slain. The eldest son, if he so wished, would then be able to preserve his own life by divulging the secret. Consequently, the aged Pict and his two sons had their throats cut and Trost, the eldest son, was ordered to play his part in the pact. He replied that he would only divulge the recipe to one of his own race, namely, Niall, a Pictish Arch-druid, who had become a traitor to his people. This request was granted, as Trost, being unarmed, appeared to be quite harmless. While talking to the priest on the top of the cliff, he suddenly grasped him and plunged over the edge with the traitor, shouting "Revenge ! the secret dies! ; and the secret of the brewing of heather ale was lost for ever.

Robert Louis Stevenson relates the same story in vivid verse—"Heather Ale" (the first stanza being as follows) :—

From the bonnie bells of heather
They brewed a drink lang syne,
Was sweeter far than honey,
Was stronger far than wine.
They brewed it and they drank it,
And lay in blessed swound
For days and days together
In their dwellings underground.

Show Reports

NORTH BERWICK

1st September 1960

THE NORTH BERWICK SHOW, sometimes known as the Autumn Gentian Show, was in 1960 characterised by a scarcity of autumn gentians. The Peel Trophy Class for three pans *Gentiana* species or hybrids usually attracts a large entry, but, most regrettably, no member was able on this occasion to produce three gentians of sufficiently high standard to show in the class. Several of us felt that had the Show been a week earlier or a fortnight later we could have put up a better display. (But then, of course, our cyclamens and heathers might not have been at the peak of perfection !).

The George Forrest Memorial Medal for the best plant in the Show was awarded to *Campanula zoysii*, a very well-flowered specimen of a plant which has not previously been seen at North Berwick. This, together with *Cyclamen neapolitanum album* and *Gentiana saxosa* formed the three-pan entry in Class 1 for which Mrs. Boyd-Harvey

was awarded the East Lothian Trophy. In the same Class, Mr. J. Archibald included in his entry a specimen of *Saussurea stella*, an interesting species which has not been seen at the autumn Show for some years. In the Class for two pans, both of the same family, cyclamens were again in evidence, exhibited by Mrs. Boyd-Harvey and the Hon. Miriam Pease. A nice entry here was from Mrs. Hinton, who showed two fine specimens of Crassulaceae—*Sempervivella alba* and *Crassula sarcocaulis*, both grown in the open ground with no kind of protection in winter. In the Class for silver-grey foliage, an interesting exhibit was *Senecio candicans* grown from seed collected on the shores of the Straits of Magellan by Mrs. Tweedie. This is a plant which can become coarse if given a free root-run in the open ground, but Mrs. Tweedie had kept it under control by growing it in a five-inch pot and removing those roots which emerged at the drainage hole.

Both classes for cushion plants were won by Mr. Esslemont, with those tightly packed "buns" which are typical products of his famous alpine house. In the class for Campanulaceae, another plant seldom seen on the show bench was *Codonopsis convolvulaceae*, expertly presented by Mr. Archibald, so that the beauty within the flowers could be easily appreciated. In the class for *Gentiana* species, the only entries were *Gentiana bellidifolia* (Mrs. Boyd-Harvey) and *Gentiana caelestina* (Mr. Sanderson), neither exactly typical autumnal species, but in the hybrid class a good specimen of *Gentiana* x *macaulayi* was shown by Mrs. Maule and *Gentiana* 'Inverleith' by Mrs. Hannah.

The *Sedum* classes were again packed with the beautiful glaucous leaves and pink flowers of *Sedum cauticolum*. Since this species obtained its Award of Merit at the 1959 North Berwick Show, it has perhaps become almost too popular on the show bench. It is a spectacular plant for the rock garden or a wall, but the time has probably arrived when visitors should be shown that there are other *Sedum* species which are of interest for autumn flowering, such as the unusual *Sedum hidakanum* shown by Mr. and Mrs. Baillie.

The Special Prize offered for a rock garden plant grown from seed was awarded to Miss Dorothy Pape for a vigorous young flowering specimen of *Omphalodes luciliae*. The Logan Home Trophy for a miniature garden was awarded again to Mr. and Mrs. Baillie for their well-established "mountain" of tufa. The Mary Bowe Memorial Trophy, which has recently been presented by Mrs. Baillie in memory of her mother, was awarded to Mrs. Boyd-Harvey for the highest aggregate in Section I.

In Section II the Club Bronze Medal for the highest aggregate was awarded to Mrs. Mill Irving, and the East Lothian Silver Cup went to Mr. Henry Porter's *Sedum pluricaule*.

The Trade Gold Medal was awarded to Messrs. Edrom Nurseries for an exhibit which included many plants not seen in the competitive classes, notably many whose chief interest lies in their decorative fruits.

Mrs. Mencel once again added interest to the Show with her display of china, hand-painted with alpine flowers, and with some of the birds of the Firth of Forth. Very much admired were her minutely exquisite paintings of the bird-encircled Bass Rock and Fidra Island, the originals of which could be seen out of the windows of the hall.

The Show Secretary and the exhibitors would like to thank Mrs. Knox Finlay, Miss Logan Home and Mr. Alfred Evans for their expert services as judges. They would also like to say how very welcome were the entries from members who had travelled a considerable distance with their good plants, particularly those from as far away as Northumberland and Aberdeen.

The Show Committee are most worried about the small number of entries in Section II, which is designed to encourage those members to show who have not previously enjoyed the pleasures of being participants rather than spectators. Winners of Section II Bronze Medals have to move up into Section I, and how many new exhibitors will there be to fill Classes 35 to 46 in 1961 ? There must be many splendid plants growing in the favourable soil and climate of East Lothian, which have never been seen except by the immediate circle of friends of their owners. Are their owners afraid of damaging them in the lifting ? North Berwick is only a one-day Show and the natural lighting of the Sun Parlour is excellent, so that there is no risk of the pale lop-sided growth which occurs in some plants after a three-day Show in April with poor side-lighting. Lifted plants re-establish quickly in September when the soil is warm, and there is gentle air humidity. Perhaps new exhibitors are diffident about their smaller plants being compared with the large old plants in Section I. That is the whole point of having Section II, so that younger plants and less experienced members can compete among themselves. It should be remembered that some of those ancient plants will eventually become senile, and that young vigorous specimens will then be required to step into their vacated shoes. The beginner who will take the trouble to plan an entry of plants quite *different* from those already filling Section I will indeed stimulate the "old hands" into taking stock of their own autumn plants. The nurserymen and their catalogues will provide many new ideas for new exhibitors.

All the Show committee have had experience in exhibiting and they all remember the time when they too were Section I beginners. If consulted *now*, they may be able to give ideas on what plants should be receiving special attention in readiness for September 7th. If consulted by September 3rd, they will give help in compiling entry forms, and if consulted before September 6th they will advise on how to present a good plant so that it is looking its best in the great day.

In case there are any members who do not know the names of their committee, here they are :—

Mr. C. W. Sanderson, Show Secretary (Cockburnspath 210).
Mrs. Richard Baillie (Longniddry 2140).
Mrs. Bathgate (Gifford 310).
Mrs. Boyd-Harvey (Dirleton 277).
Mr. G. S. Burrows (Dirleton 214).
Miss Christian Nisbet (Humbie 216).
The Hon. Miriam Pease (North Berwick 2436).
Mrs. David Tweedie (Dirleton 228).

"EX-BEGINNER"

PENICUIK

11th March 1961

THE EIGHTH Penicuik Show was held in St. Mungo's Hall on 11th March 1961, as usual in conjunction with the Bulb Show of the Penicuik Horticultural and Industrial Society, to whom we are indebted for the very smooth running of the arrangements—to say nothing of the very excellent service of teas which the ladies of the Industrial Section provided. Their Bulb Show was even better this year, with the entries well up on previous years and the quality excellent.

It is interesting to compare this year's Show with just under a hundred entries in both the Sections, Open and Restricted, from twenty-one competitors, with the 1955 Show, which was the first to have both sections, where there were 34 entries from eleven competitors (the first Show had 24 entries from eight).

The winter hereabouts had been a very easy one, but following on one of the wettest and coldest autumns the writer can remember. This had probably been largely responsible, together with the surprising spells of very warm weather with strong sun just before the Show, for some curious changes in the exhibits. Many of the crocuses had leaped into flower and then gone over very rapidly, as had the irises, but tulip species were better represented than ever before. The Kabschia Saxifrages were not nearly up to standard, many having put on a lot of vegetative growth with much less flower. Some other bulbs had, for some odd reason, failed to develop in time—there was a complete absence of any of the narcissus species other than minor and asturiensis and some hybrids except for one lonely pot of *N. bulbocodium var.*

The standard of the exhibits was very good, with perhaps a lack of some of the exceptional "high-lights" of previous Shows, and the competition was close in almost all classes with entries of up to nine in the classes. The judges were Mr. Wilson, Mr. Duguid and Mr. Ponton. The Asiatic primulas were much better this year and the Forrest Medal was awarded to a very fine pan of *P. bhutanica* shown by Mr. Esslemont of Aberdeen. The Midlothian Vase for the best plant in Section II was awarded to *P. marginata* "Pritchard's var., shown by Dr. and Mrs. Tod. This was a well-flowered plant of a

particularly deep, rich colour which led to it returning home rather smaller than it had been at the start of the Show ! The Midlothian Bowl was awarded to Mr. and Mrs. Kilpatrick of Slipperfield, exhibiting in Section II. Their plants were of excellent quality and beautifully presented.

The class for three rock plants was won by Mr. Archibald of Wishaw with a nicely-flowered *Rhododendron forrestii*, *Lewisia tweedyi* and *Soldanella pusilla*. The second went to Mr. Esslemont of Aberdeen with a magnificent *Rhododendron leucaspis*, *Saxifraga oppositifolia latina* and *Draba mollisima*. Mrs. Maule of Balerno was third with *Rhododendron oleifolium*, *Daphne genkwa* and *Soldanella alpina*. Dr. Hamish Robertson won the first in the class for one rock plant with a beautiful pan of *Shortia uniflora*, most beautifully flowered.

Mrs. Davidson had a notable plant of *Raoulia eximia* in Class 25 which caused some debate among the judges as to whether it was, or was not, alive. At this time of the year this is a most difficult plant to decide about, but with the Show Secretary's weight thrown in, coupled with the firmness of the plant and some young growth towards the bottom of the cushion, the opposition was over-ridden and it won its class !

Gold Medals were awarded to our usual two Trade supporters, for whose presence we were grateful. The Edrom Nurseries had an exhibit of rock plants in pots and showed a variety of dwarf bulbs, especially irises, crocuses and tulips, together with some good Petiolarid primulas. Ponton's Nurseries had a built-up rock garden with dwarf bulbs, Kabschia saxifrages and heaths, backed by dwarf conifers. The writer would like to express his appreciation of the support these two firms have given him—and without asking, at that—whenever they are not completely smothered in snow at the time of the Show. By an oversight any mention of their exhibits was omitted last year, but this was a piece of carelessness on the writer's part.

There was a very good turn-out of both Club members and of the public, even though it was showery most of the afternoon, and everyone seemed to enjoy themselves.

HENRY TOD,
C.R. Midlothian and Hon. Show Secretary.

Discussion Weekend at Pitlochry

29th to 30th October 1960

THE BEAUTIFUL setting of Pitlochry in Perthshire was chosen for the 1960 Discussion Weekend. This was the first time that a Discussion Weekend had been held in rural surroundings and some doubt had been expressed as to whether sufficient local members would be available to swell the gathering to the size which had been attained in cities. The doubters were magnificently confounded when the Highlands, in all the glory of Autumn colouring, attracted no less than sixty-two resident members, and twenty local members brought the number at lectures up to a larger total than had prevailed at any previous weekend. Forty-two members were accommodated at Fisher's Hotel and twenty at Scotland's Hotel, only three minutes distant.

Fisher's Hotel was the focal point of the meeting and a large lounge with comfortable seating and heating was placed at the disposal of the party for the lectures. When the whole party invaded the dining-room at once, complete with excellent appetites engendered by the Highland air, it taxed all the hotel's resources to feed the multitude, but all were well fed and returned to the next lecture in time. The presiding genius was Major-General Murray-Lyon, D.S.O., M.C., who was most successful in making the weekend go with a swing.

The members were very grateful to Mrs. Stuart and Mr. K. J. Green, who had done all the organization and correspondence over twelve months of planning ; and it was due to their good work that the members had such an entertaining and comfortable weekend.

A ready response had been made to a request for plants to sell to cover expenses and such enticing attractions were on sale as *Gentiana* "Devonhall," *Oxalis inops*, *Androsace jacquemontii* (syn. *A. villosa*) and drupes of *Coprosma brunnea*. They all found ready buyers.

General Murray-Lyon opened the proceedings with an apt little speech, but as the lectures are to be reported in full, they can be passed over here ; suffice it to say that rarely have such beautiful coloured slides and such informative lectures been placed before the Club at any gathering, and gratitude must be given to the lecturers, their chairmen and not least to those who handled the excellent projector in such a masterly fashion.

On Saturday the evening entertainment took the form of a Brains Trust. General Murray-Lyon was in the chair and the members of the Trust were Dr. M. E. Gibson, M.B., Ch.B., Miss M. E. King and Dr. H. Tod, F.R.S.E. General Murray-Lyon introduced the panel. He said that Dr. Gibson was a very well known member of the Club from South-west Scotland. She had been a member for many years and was a fine cultivator of plants. Miss King was there to represent the Trade and was well known as a successful propagator and he did not think that our President, Dr. Tod, needed any introduction.

The first question was : "Is it advisable to use carpeting plants in conjunction with dwarf bulbs ; if so, what plants are recommended ?" Dr. Gibson said that plant coverings must be pretty flat, not to screen the bulbs, but with taller bulbs they could be higher and so provide support. She found some bulbs did better without any covering. Thymes and raoulia could be used and would economise space. Dwarf cotoneasters would be suitable for taller bulbs. Miss King said that covering should not be thick, as bulbs required baking. Dr. Tod said that it would be valuable by absorbing moisture and so keeping the bulbs dry, but it must not be too thick or it would prevent proper baking. General Murray-Lyon said that he found covering on bulbs encouraged slugs to eat them. Mr. Livingstone suggested Autumn gentians as a cover plant.

The second question was : "What plants would you recommend for giving colour of flower and foliage in October and November in the Rock Garden ?" Dr. Tod suggested solidago, dwarf campanulas, Autumn crocus and *Serratula shawii.* Members suggested *Saxifraga fortunei,* meconopsis, corydalis, cyclamen, acers, gentians, oxalis, chrysanthemums, shortias and heathers. Dr. Gibson : "*Campanula poscharskyana.*"

The third question was : "In view of the fact that many alpines are found only within certain altitudes, does the Brains Trust consider that atmospheric pressure might conceivably have some influence upon plant life ?"

Dr. Tod : "No, it is radiation and light intensity." Mr. Livingstone said that plants at 4000 ft. in the Alps were the same as those at 2000 ft. in the Highlands and at sea level in Iceland. Miss Pape called attention to such plants as *Gentiana verna* and *Dryas octopetala* to be seen at their best on the sea shore in County Clare. Dr. Tod said it was a combination of latitude and altitude and that Alpine level dropped as it got nearer North.

Two questions were then taken together : "Are there really any lime lovers, or would not lime tolerators perhaps be a better description ?" and "At what stage in the pH Scale does the soil become too acid for dwarf rhododendrons and also for the calcifuge gentians ?"

Dr. Tod : "Limey plants will grow in acid soil, but acid plants will not grow in limey soil." He said that pinks were an example of this. Few plants would grow in an excessively acid soil. At pH4, rhododendrons tended to go off. The late Colonel Lowndes' garden in Hampshire was on green sand and there was a high rainfall. The soil was so acid that it was pH3.5, and lime had to be added to grow such calcifuge plants as nomocharis and rhododendrons.

A member : "What about calcium ?" Dr. Tod said that some calcifuge plants could be grown on an alkaline soil caused by magnesium but not by calcium. Mr. Mitchell asked a question about gypsum. A member : "What is pH ?" Dr. Tod explained that it was a scale in which 0-7 was acid to neutral and 7-14 neutral to very alkaline.

The fifth and sixth questions were then taken together : "Can *Androsace alpinus* (syn. *A. glacialis*) be induced to flourish and flower in captivity ?" and "Can the panel give a prescription for the successful cultivation of *Ranunculus glacialis* ?" These questions provided a very lively discussion. Dr. Tod suggested scree conditions for both. Mr. Esslemont : "Gritty soil and moisture in pans." Dr. Morison said he had had success for three years in scree. Mr. Duguid said that all his outside plants died, but others lived in pans for three years. The general decision was that snow cover and freezing in winter were essential. No one had had much success, but such success as had been achieved had been in pans.

A further two questions were then taken together : "Are cloches and bits of glass all over the rock garden in winter justified aesthetically or otherwise ; or should plants which require, or are supposed to require such protection, be accommodated in frame or alpine house ?" and "Can the team say whether they approve or disapprove of using artificial heat for growing plants suitable for the Alpine House or Rock Garden ?"

Dr. Gibson said she got tired of glass and windolite, but she obtained some small glass bowls at a multiple store. She added humorously that these served the dual purpose of protecting plants in winter and serving ice cream to guests in summer. Miss King said that she hated to see pieces of glass in the rock garden. She did not approve of any heat, but she had a frame sunk in the garden and filled with scree mixture. This was almost invisible and the frame light was put on only in winter. Dr. Tod said that moisture in winter killed more than frost did and that glass cover was better on silvery plants and petiolarid primulas. Any heater in an alpine house must be in the ridge of the roof. It dries the air. General Murray-Lyon said he made caves in the rock work to shelter such plants. Colonel Dundas said he found fibre glass very successful, especially with soldenellas and androsaces. Mr. Livingstone said he found a 1 kw. heater in his alpine house very useful.

The eighth question was : "Should plants grown in alpine houses be allowed to compete at our Shows with those grown in the open ? If so allowed, is there not a danger of plants which are not really hardy having an advantage over those grown in the open, and is that desirable in a Rock Garden Club ?"

Miss King saw no reason why they should not be allowed to compete. Dr. Tod thought the same and said that quite often plants lifted from the open ground were far finer. Dr. Gibson also agreed with this view. A member said it would bring in the question of what was an alpine house, which would be very difficult to define, but that a very distinct line should be drawn if the plant that is shown is not hardy.

Question nine was : "Do you like to see labels in all the plants in a rock garden ?" Dr. Gibson said no, if she could remember all

the names. The labels should be as inconspicuous as possible. Miss King said yes, labels were a must. General Murray-Lyon : ''Yes.'' A member : ''What about blackbirds ?'' Another member said that he had no labels, but that he tended to dig up bulbs in winter.

The next question was : ''Could the Brains Trust recommend an efficient method of destroying, or hastening, the decay of tree stumps, chiefly ash and elm ? It is essential that the method used is non-toxic to animals and birds.'' Dr. Tod suggested a hole made in the stump and filled with sodium chlorate and a plug put in. Next year the stump could be burnt. Several members suggested saltpetre, which hastened decay and made the burning of the stump more easy.

The tenth question was : ''Can anchusas be propagated by root cuttings, and in particular *Anchusa caespitosa* ?'' Members wished to know if the true *Anchusa caespitosa* was intended or only *Anchusa caespitosa* of gardens. It was decided that only the latter could be dealt with as the former was now almost unobtainable and no one had any experience. Miss King said root cuttings were the only way to propagate *Anchusa caespitosa* of gardens.

The eleventh question was : ''Can the team suggest any means of eradicating the particular weed which we know as sandgrass—a sagina ?'' There was some discussion as to what was meant by this weed, but it was decided that pearlwort was intended. Dr. Tod said that where the weed grew very thickly the surface could be pared off with a sharp knife and fresh good soil mixture top dressed. No satisfactory method was suggested for general purposes.

The last question was : ''I find that seed pans containing seed which it is advisable to freeze, which we plunge into the ground during the winter, frequently crack or flake. Is there a way of avoiding this expenditure of seed pans ?'' Miss King said the pans need not be plunged, but stood on an ash bed and covered. Dr. Tod said if the pans were plunged level with the rim, they would not crack. This ended a very interesting and instructive evening.

On Sunday morning at the break, the party divided. Some went to the garden of Major-General D. M. and Mrs. Murray-Lyon at Ardcuil, and the others betook themselves to Tigh-a-Chladaich, Moulin, the garden of Mr. and Mrs. T. A. Stuart.

At Ardcuil the members were delighted with the magnificent view to be had from the house and garden, but their attention was soon diverted to the fine display of well-grown plants. Autumn gentians were still in bloom and flourishing plants of shortias had their foliage turned to glorious colourings. Such plants as *Corydalis cashmeriana* and cyananthus showed what fine things there had been to see earlier in the year. There were numerous cassiopes and, not least, a fine large plant of the difficult *Cassiope wardii*. Dwarf rhododendrons were everywhere. The sharp slope of the hill lent itself to the very attractive layout of the rocks and the steps, all very well sheltered by shrubs and, as the garden mounted to the wood above the house, there was a

very healthy collection of larger rhododendrons in a sheltered corner. Among these was noted *Rhododendron orbiculare*, with the largest leaves ever seen. Altogether a garden where every plant seemed to flourish, though it might have been wondered how the owners tore their eyes from the view in order to attend to the needs of the plants.

Tigh-a-Chladaich proved to be a charming small garden which contained an astonishing large number of interesting and well-grown plants. These included gentians, meconopsis, shortias, dwarf rhododendrons and many other small shrubs and rock garden plants. There was also a heather garden and a good collection of ferns in a shady corner. In the greenhouse were noted pleiones and a fine plumbago in full bloom. There was also a collection of cacti. The garden is an outstanding example of good planning and economy of space. The final lecture was given after lunch and a most memorable weekend closed with a few well chosen words from General Murray-Lyon.

Plant Hunting in Yugo-Slavia

Dr. JAMES DAVIDSON

THE JULIAN ALPS were visited in 1958. The Alps are in N.W. Slovenia, the most northerly of the Jugoslavian States, and are composed of very hard and slippery dolomitic limestone. They possess a flora similar to that of the Eastern Alps, including the Karawanken mountains which form the frontier between Slovenia and Carinthia in Austria. There are a number of comparatively high rugged peaks amongst the Julians, the highest being the Triglav, situated about the centre and dominating the range.

The northern part of the range was explored first, headquarters being near a village called Kranjska Gora in the valley of the river Save. This valley is claimed as the most beautiful in Europe.

The Julians and Karawanken Mountains are the home of *Campanula zoysii*. This rare campanula is usually found emerging from fissures and cracks in the hard rock. Specimens can also be found growing in the dried-up river beds where no doubt seed washed from the heights has settled. *Aquilegia einseleana*, a dainty little plant about ten inches high, grows in association with the campanula. *Rhododendron hirsutum* is widespread, as is also *Rhodothamnus chamaecistus*. They form great and impressive drifts of colour. In woodland country *Cyclamen europaeum* was common. It was interesting to note that its corms were usually growing at a considerable depth. Another woodlander was the red helleborine—*Cephalanthera rubra*, one of the most beautiful of the orchids, having very large flowers. It is a plant which occurs more frequently towards the East of Europe. Growing freely in similar surroundings were *Moneses uniflora*, *Pyrola secundiflora*, *Paris quadrifolia*, and a dianthus resembling *Dianthus superbus*. *Saxi-*

fraga caesia and *Dryas octopetala* are comparatively common and widely distributed from about 2000 ft. to relatively high altitudes. The beautiful little *Primula auricula albo-cincta* with its large yellow flowers and white margined leaves was found growing about the rocks of the Spik—a rugged mountain of about 8000 ft. The dwarf *Alyssum wulfenianum* (*Alyssum ovirense*) with its beautiful butter yellow flowers, and *Potentilla nitida* grew in great quantity in scree at the top of the Vrsic pass. Here also were *Myosotis alpestris* and *Gentiana clusii*. Aconitum, verbascum and *Digitalis lutea* grew along the roadside in the lower reaches of this pass. Continuing over the Col, the road descends to the Trenta Valley, through which the river Isonzo flows. This valley is famous not only for its beauty but for its chamois, capercaillie, and trout. Situated here is the Juliana Alpine Garden containing a complete collection of plants of the Julian Alps.

Exploration of the southern aspect of the Julians was from Lake Bohinj, which was reached from Bled by car. This lake has a magnificent setting. We were surrounded by an amphitheatre of cliffs about 3000 ft. high ; these had to be surmounted before the mountains could be approached. The journey to the Triglav, twenty miles away, was taken in stages, staying at mountain refuge huts on the way. On the plateau above the lake and the cliffs *Pinus montana* was growing in profusion. The valley of the seven lakes on the way to the Triglav is a happy hunting ground for plants ; *Gentiana tergestina* in abundance is distinct from *G. angulosa*, although *G. tergestina* is usually inaccurately given as a synonym for *G. angulosa*. Laburnums growing high up on the cliff faces were an interesting and pleasant sight. Amongst the plants found on this trek over dry arid mountainous country were the white *Potentilla clusiana*, *Ranunculus traunfellneri*, a beautiful little white buttercup with finely cut leaves, *Hutchinsia alpina*, *Soldanella alpina*, the dainty-leaved little *Soldanella minima*, and *Anemone baldensis*. At a height of about 8000 ft. on the verge of a snow field twelve species of alpines were found growing on a small scree. Amongst these were *Eritrichium nanum*, *Papaver alpinum* (white and yellow forms), *Thlaspi rotundifolia*, *Petrocallis pyrenaica*, and *Linaria alpina*. On reaching the Triglav a very beautiful but extremely rugged mountain, *Eritrichium nanum* was again found growing in quantity in screes. Curiously enough, the synonym of this plant is *Eritrichium tergluensis*—Mount Terglu being an old name for the Triglav. On the return journey to our base, as woodland country was reached hundreds of *Lilium carniolicum* were found growing against a background of grey rock. They were in full bloom with dazzling orange-scarlet flowers—a truly wonderful sight !

The account of this expedition was fully illustrated by a series of exceptionally fine colour slides. The general mountain views were superb, but perhaps the close-up studies of some of the woodland plants presented the finest pictures, technically and artistically.

D. M. M.

Some Plants That Do Well in My Garden

MAJOR WALMSLEY

IN HIS introductory remarks Major Walmsley gave a brief description of the soil and climatic conditions prevailing in his garden in Wigtownshire.

The average rainfall for the year is about 42 ins. Snow, and temperatures below 20 degrees of frost are unusual, winter damp probably being the worst enemy.

The soil is lime-free, but not particularly acid. It is light and very stoney, with a shale-like rock less than one foot below the surface in places. Drainage is therefore good, but losses do occur when there is a hot, dry summer.

Dwarf bulbs and most of the dwarf ericaceous shrubs do well. The climate suits many of the border-line shrubs, which might not flourish on the east side of the country or in the Highlands. A number of the true alpines, however, such as the gentians and some of the primulas, do better in a harder climate, where they have a covering of snow and spells of frost which enable them to rest for at least part of the winter. All the plants are growing naturally. They get no manure or fertiliser, and only in a few cases do plants which are particularly susceptible to damp have the protection of a sheet of glass during the winter. There is a never-ending battle to keep the ground comparatively free from weeds, and from a heavy growth of moss in winter, which chokes many low-growing plants and tends to rot the stems.

Major Walmsley went on to describe how the garden—which consisted only of a rose bed and herbaceous border, besides the vegetable garden, when he went to Culderry nearly thirty years ago—has been gradually enlarged. About an acre of surrounding field has been brought under cultivation and turned into rockeries, screes and beds for flowering shrubs. The result is in no sense a formal garden, but rather a series of small gardens, with plants in every odd corner.

A comprehensive collection of beautiful coloured slides (more than 120) taken by himself and Mrs. Walmsley was shown, with representatives from every season including early spring and winter. The flowering shrubs were particularly fine, and amongst these a magnificent specimen of *Philesia buxifolia* is memorable.

SELECTION OF SLIDES SHOWN

Erica med. W. T. Rackliffe
Pond, Iris laevigata
— Prim. florindae
Nar. cyclamineus
Polygala chamaedrioides
— vayredae
Azalea hinemayo
Oxalis adenophylla
— flor. rosea
— inops
Prim. sieboldii
— viali
Roscoea cautleoides
— purpurea
Stachys nivea
Polygonum vaccinifolium
Crocus tomasinianus
Dryas octopetala
Aethionema "Warley Rose"
Philesia buxifolia

Prim. marginata
Haberlea rhodopensis
Clematis macropetala
Corydalis cachmeriana
Schizocodon macrophyllum
Erica H. E. Beale
— australis, etc.
Hypericum pat. Forrestii
Desfontainea spinosa
Tricuspidaria lanceolata
Embothrium lanceolatum
Lilium regale
— auratum
Sunk Garden
Juniper, Boykinia jamesii
Iris lacustris
— innominata
Celmisia
Daphne cneorum
— arbuscula
Phlox adsurgens
Phyllodoce coerulea
— nipponica
— empetriformis
Phyllothamnus erectus
Kalmiopsis leachiana
Daboecia azorica
Bruckenthalia spiculifolia
Orphanidesia gaultherioides
Menziesia ciliicalyx
Pieris forrestii
Leucothoe keiskii
Rhodo racemosum
— cilpinense
— ledifolium
— patulum
— macrostemon
Heaths
Gentiana macaulayi
— saxosa
— sino-ornata
— loderi
— acaulis, Tulipa clusiana and chrysantha
Rhodohypoxis baurii and platypetala
Cyananthus sherriffii
— lobatus
Nar. bulbocodium
Dianthus haematocalyx
Androsace lanuginosa
Camp. sartori
Sanguinaria can.
Geranium dalmaticum
Montia parviflora
Saponaria ocymoides rubra comp.
Sax. apiculata
Armeria caespitosa
Incarvillea delavayi
Mec. quintuplinervia
Paeonia lusitanica
— obovata in fruit
Cyclamen neapolitanum
— repandum
Lewisia howellii hybrids
Lapeyrousia cruenta
Allium ?
Agapanthus nanus
Coronilla emerus

Saxifrages

By DAVID LIVINGSTONE

WHEN I agreed to give this talk on saxifrages I expressed a fear that illustrative material might be difficult to obtain. So it has proved, but with the assistance of the Slide Library, Mrs. Boyd-Harvey, Mr. W. C. Buchanan, Mr. A. Evans and Mr. Stewart Mitchell, I now have a sufficient number of slides. Unfortunately, they do not cover all the saxifrages which I have grown at one time or another and which I would have liked to show you. Indeed, I shall be showing you slides of a number of plants which I have not grown personally but, of course, I have grown similar plants. In the case of a large genus like saxifrages it is inevitable that one can grow only a small selection, but there is no doubt in my mind that every rock gardener, no matter how small his garden is, should have some saxifrages, a good number of which not only give a liberal quantity of flowers but are also decorative at all times of the year. Those of you who have alpine houses or cold frames will find this genus particularly suitable for pot culture. The early flowering species and varieties give a very rewarding display of flowers grown in this way, but I should like to emphasise that these plants are very hardy and will grow and bloom well out of doors without protection of any kind.

The saxifrage genus, taken by and large, is not a difficult one to grow successfully but, of course, there are a few plants that are excep-

tions to this generalisation. These few, however, can be left to the more expert grower, and there are plenty of other fairly easy but excellent plants suitable for even beginners. The plants which I shall show you are mainly representatives of three large sections of the genus which usually figure prominently in the rock garden nurseryman's catalogue. You may not find all of them in catalogues, but you will find similar ones and nurserymen are very willing to assist in making a suitable choice.

Here are some brief notes on the cultivation of these three sections.

ENCRUSTED or SILVER SAXIFRAGES. These plants are so called because their leaves are heavily pitted or encrusted with lime, giving them a silvery appearance. They can be grown successfully and without much difficulty in any well drained gritty soil. They are particularly suitable for growing on raised rock ledges or in crevices in the rock work. Silver saxifrages may be planted in full sun, but they do not object to partial shade.

ENGLERIA SAXIFRAGES. As a group these plants perhaps require a little more skilled attention than the previous section, but given a gritty well drained soil or scree conditions in full sun there is no reason why even a novice should not grow them reasonably well. In prolonged hot dry weather they should be watered artificially. The engleria saxifrages make good subjects for the alpine house or cold frame.

KABSCHIA or CUSHION SAXIFRAGES. This group require a rough gritty compost or scree conditions and again it is necessary to ensure that they have plenty of moisture at their roots during drought conditions. These too may be planted in full sun in Scotland, but when they are grown in pots they should be afforded filtered shade in spells of prolonged hot sunshine, otherwise there is a tendency for the foliage to be burned.

Most, but not all, saxifrages are lime lovers and some growers add limestone chips to the compost to roughen it up, but if you grow a mixed collection of plants there are sure to be lime haters amongst them and the added lime may kill them. I choose to use ¼ inch blue whinstone chips, which serve the purpose well, cause no ill effects to other plants, and in any event the saxifrages seem to grow just as well when these are used.

And now to the slides :

S. strigosa : Free flowering yellow species from the Himalayas. Good vegetable soil in partial shade. Particularly valuable, as it flowers in early Autumn or late summer.

S. primuloides "Elliott's Variety" : A miniature London Pride with sprays of good pink flowers ; found by Clarence Elliott in the Pyrenees.

S. primulaize : A hybrid which can be obtained in several colours ; suitable for a cool position.

S. "Mona McGrory," "Triumph" and x Wallacei are three very good mossy saxifrages. Their colours are pink, scarlet and white respectively. Wallacei is often found in catalogues as Camposii. They should be planted in a cool, partially shaded position and they benefit from an annual top dressing of gritty, leafy soil worked in between the rosettes.

S. oppositifolia, and its various forms *splendens*, *latina*, "W. G. Clark," are very useful rock garden plants with purple, almost stemless flowers. They should be grown in light gritty loam or in the scree. It is fatal to provide a rich diet for them. A too rich soil and the plants will run to stem and leaf with but few flowers. Grown well, the plants will disappear each spring under a wealth of blossom. There is also a white form for which I have no great liking.

The next group all belong to the encrusted or silver section referred to earlier.

S. aizoon is a very variable species both as regards size and colour. Easily grown and easily propagated by division.

S. cotyledon norvegica throws large handsome spikes of white flowers.

S. "Esther" is a good hybrid with pale yellow flowers.

S. longifolia is a cliff-dwelling species from the Pyrenees. It builds up a most striking rosette of large strap-like silvery leaves over three or four years, flowers, and dies. It can only be propagated by seed. Fortunately there are two others almost as handsome and with the same large arching sprays of white flowers which are perennial and which are easily propagated by offsets. These are *S. longifolia* "Tumbling Waters" and *longifolia* "Symons Jeunei." Clarence Elliott many years ago raised a very fine seedling from *longifolia* which he named "Cecil Davies." I have grown this hybrid for many years, but it seldom flowers. Nevertheless, its round silver rosettes about the size of half-a-crown are so beautiful that it is well worth its place for the decorative value of its foliage.

S. "Snowflake" is a very free flowering hybrid with, as the name denotes, white flowers. An excellent plant for a rock wall or crevice.

The following plants are all Englerias and are notable examples of this section.

S. "Biasolettii" and "Chrystalae" are both hybrids from *S. grisebachii* with the same bold silver rosettes. The former has fine red spikes of flowers and the latter, which is new to me, has beautiful crimson-purple spikes. I have now obtained a plant of "Chrystalae" and it looks to me as though it would be a particularly good subject for the early Shows. The only firm which I know has it for sale is Waterperry Horticultural School, Wheatley, Oxford, from whom I have also obtained two Kabschia saxifrages which I have not grown before and which look very promising indeed. They are "Christine," deep cerise flowers over dark-green, silver edged rosettes, and *S. burseriana major lutea*, with large soft yellow flowers freely produced.

S. grisebachii "Wisley variety" is the finest of the Englerias. It has fine big silvery rosettes and handsome, thick, flowering stems clothed in thick red velvet. It has small pinkish flowers enclosed in showy red calyces. Truly a remarkable plant which retains its attractive qualities over a long period.

S. thessalica has small silver rosettes from which rise flower stems of a striking deep purple. As with many of this type of saxifrage, the flowering stems and calyces are more attractive than the flowers themselves.

And now to a most rewarding group the KABSCHIA or cushion saxifrages, most of which bloom in February and March.

S. apiculata and *S. elizabethae*, two different shades of yellow, are easy, free flowering plants of comparatively quick growth.

S. burseriana crenata has long been a great favourite of mine. It has white flowers with crimped or frilled petals.

S. burseriana "Gloria" has larger white flowers than the previous one and is regarded as one of the finest of this group, but I find that sometimes it is not very free with its flowers and for that reason I prefer *S. burseriana crenata.*

S. caesia is a dainty little species with small white flowers which looks more like a silver saxifrage.

Ss. "Cranbourne," "Dainty Maid," *x irvingii* and *x jenkinsii* are all very good pinks with the first named the best of the lot but requiring perhaps a little more care in cultivation. For the beginner I would choose *x irvingii*, which was one of the first rock garden plants I grew.

S. diapensioides lutea is a fine pale yellow species, but somewhat difficult. It must be grown in a very gritty compost indeed to keep it happy.

S. "Faldonside," a hybrid raised in Scotland, has beautiful round yellow flowers of good substance but is, occasionally, shy with its flowers. It is, nevertheless, such a fine plant that it deserves to be in every collection.

S. x paulinae is another yellow hybrid of merit which is very free with its flowers.

S. lilacina, a Himalayan species and parent of many good hybrids, is a first rate plant for the specialist. As its name denotes, its flowers are lilac in colour. It should under no circumstances have lime added. It does best, in fact, when chips of sandstone are used in the compost and it should, contrary to the general rule, be given partial shade.

S. "Riverslea" is yet another fine hybrid. It has small cup-shaped, purple flowers over grey rosettes. Its great virtue lies in the fact that it stays in flower over a long period.

These, then, are a selection of the many saxifrages available to provide us with colour, shape and form in the rock garden, cold frame or alpine house.

Book Reviews

"THE ROCK GARDENERS' BEDSIDE BOOK." pp. 156. The Alpine Garden Society 1961. 5/-

This is a compilation from the Alpine Garden Society's *Bulletin* and is an engaging mixter-maxter of all sorts of articles, notes and the like of interest to rock gardeners.

It is divided into six "Staves," "Of Rock Gardens, Screes, Alpine Lawns and Cattle Troughs"; "Cultivation"; "Among the Hills"; "Some Alpine Plants"; "In Lighter Vein" and "A Diversity of Creatures." As will be seen, this gives a very fair coverage of the subject and, being laid up in bed at the time that I received my copy, I read it as I should not have done, namely, from cover to cover. Even read thus, it is a delightful concoction, and read properly a little bit at a time it would be even better. There are some odds and ends of information which would give the reader something to cogitate over as he relaxes last thing, others to amuse him—or her—, others to conjure up visual images to give peace and contentment, and even a few points to make the reader decide to pick up his pen first thing in the morning to write an argumentative note thereanent to the *Bulletin* or the *Journal*.

At the price of asking it is amazingly cheap and there are only a very few printer's errors here and there. The only serious criticism I would make is that I very seriously doubt whether the binding will stand up to the amount of handling that it is most likely to get, for this is a book that I think most Members will come to again and again. It is being issued on the occasion of the Third International Rock Garden Plant Conference, and I would strongly recommend all who attend it, and all other Members as well, to invest a very modest five shillings for what I consider to be worth very much more.

HENRY TOD

"ALPINES FOR TROUBLE-FREE GARDENING," by Alan Bloom. Pp. 139, with frontispiece and 57 illustrations from photographs. Faber & Faber, London. 21/-

In the foreword to this book the author explains that "trouble free" is used in the sense of a reduction of "tiresome bother" to a minimum, and the discarding of elaborate and expensive rock-work constructions.

This book, which throughout its pages does what it sets out to do, is very definitely a book I like; all the descriptions and criticisms are quite frank and candid, and while not all will agree with the author's merit pointings, it is hard to disagree with most of them—and it would indeed be strange if all thought alike concerning the comparative merits of 1000 plants.

The beginner and ordinary rock-gardener will find that though the rarities and more difficult plants one often meets with on the show benches are omitted (with very good reason, having regard to the book's title) there is still an amazing selection of rare plants from which to choose. Descriptions are adequate and brief cultural recommendations are given for each genus and often for individual species. Towards the end of the book lists of plants for special purposes are given which more than beginners may probably find very useful.

Most of the many photographs are very good and very helpful, but in a few cases detail is somewhat lacking, unfortunately, especially in one or two towards the end, so that they will not convey much to the person who does not already know the subject illustrated.

Altogether it is an attractive and extremely helpful book for the less able or less inexperienced rock-gardener, and even the expert may find in its pages helpful hints and ideas which are new to him.

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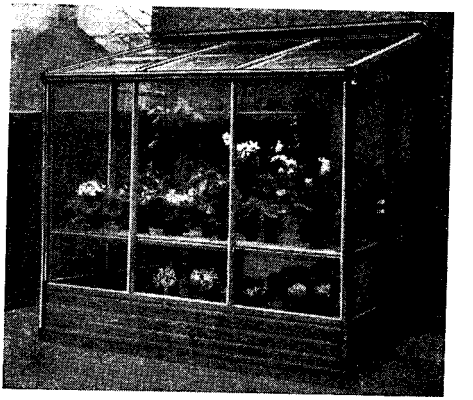

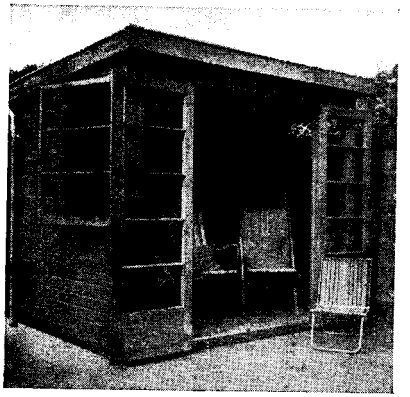

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We understand that this difficulty is not insuperable. Permission has to be obtained from the Exchange Control in the first place and evidence has to be supplied of the existence of the Society and its membership fees. Having secured sanction, the member obtains a draft from his Bank and forwards it to the Society. In practice it would probably be best first to consult one's Bank, which could supply advice and the appropriate forms.

The annual subscription is 3½ dollars, or 10 dollars for three years if paid in advance, and the Secretary, who will send further particulars, is Edgar L. Totten, 238 Sheridan Avenue, Ho-Ho-Kus, N.J., U.S.A.

In addition to its Quarterly Bulletin, the American Society has a Seed Exchange in operation.

NOTES

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THE SCOTTISH ROCK GARDEN CLUB is **your** Club.

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