Editorial Cty

The JOURNAL of THE SCOTTISH ROCK GARDEN CLUB

VOLUME XIV Part 4
No. 57

SEPTEMBER 1975

Editor P. J. W. KILPATRICK • 10 Eglinton Crescent • Edinburgh • EH12 5DD

Annual Subscription £1.50 payable before 15 October to
R. H. D. Orr, 70 High Street, Haddington, East Lothian.

Individual copies obtainable from
Dr. D. M. Stead • Esk Hause • Bishop's Park • Thorntonhall • Glasgow

Price to Non-Members **70p**, post free 75p

The JOURNAL of THE SCOTTISH ROCK GARDEN CLUB

VOLUME XIV Part 4
No. 57

SEPTEMBER 1975

Editor P. J. W. KILPATRICK · 10 Eglinton Crescent · Edinburgh · EH12 5DD

Obtainable from
Dr. D. M. Stead · Esk Hause · Bishop's Park · Thorntonhall · Glasgow

Office-Bearers for the Year 1975

Honorary President

Professor J. R. MATTHEWS, C.B.E., M.A., LL.D., F.R.S.E., F.L.S., V.M.M., Duncruib, Rosehill Crescent, Banchory, Kincardineshire

Honorary Vice-President

Sir GEORGE TAYLOR, D.SC., F.R.S., F.R.S.E., F.L.S., V.M.H., Belhaven House, Dunbar, East Lothian

President

Mr. ALFRED EVANS, Royal Botanic Garden, Edinburgh

Vice-Presidents

Mr. A. CAMPBELL, W.S., 40 Dick Place, Edinburgh, 9
Miss H. M. LOGAN HOME, Edrom Nurseries, Coldingham, Berwickshire
Mr. DAVID LIVINGSTONE, 3 Duddingston Gardens South, Edinburgh, 15
Dr. JAMES DAVIDSON, F.R.C.P., Linton Muir, West Linton, Peeblesshire
Mr. JOHN L. MOWAT, S.H.M., V.M.M., Craggan, Ceres, Fife
Mr. DAVID ELDER, 9 Christie Street, Dunfermline, Fife

COUNCIL

President

Mr. ALFRED EVANS, Royal Botanic Garden, Edinburgh

Vice-Presidents

Mr. DAVID LIVINGSTONE, 3 Duddingston Gardens South, Edinburgh, 15
Mr. JOHN L. MOWAT, S.H.M., V.M.M., Craggan, Ceres, Fife
Mr. A. CAMPBELL, W.S., 40 Dick Place, Edinburgh, 9

Ordinary Members

(To retire in November 1975)

Mr. J. D. CROSLAND, Treetops, Torphins, Aberdeenshire
Mr. J. DRAKE, Inshriach, Aviemore, Inverness-shire
Mr. ALFRED EVANS, Royal Botanic Garden, Edinburgh
Mrs. JILL SLEIGH, 18 Garscube Terrace, Edinburgh
Miss MARGARET THOMSON, 17 Craigdhu Road, Milngavie, Dunbartonshire

(To retire in November 1976)

Mr. M. G. ADAIR, 307 Churchill Drive, Glasgow G11 7HE
Mrs. B. B. CORMACK, 199 St. John's Road, Edinburgh 12
Dr. D. C. GRAHAM, 84 Caystane Gardens, Edinburgh EH10 6SY
Mrs. E. IVEY, Northbrae, Courthill Street, Dalry, Ayrshire
Mrs. K. MITCHELL, 1 Muirfield Crescent, Dundee

(To retire in November 1977)

MRS. M. HALL, 19 Coquet Vale, Felton, Morpeth, Northumberland
MRS. M. I. C. HARBORD, Cuil Bheag, Cuilc Brae, Pitlochry, Perthshire
MRS. M. G. HOLGATE, 8 Hutchison Drive, Bearsden, Glasgow
MR. R. J. MITCHELL, University Botanic Garden, St. Andrews, Fife
MR. D. S. PEARSON, 510 Lanark Road West, Balerno, Midlothian

Honorary Editor

Mr. P. J. W. KILPATRICK, 10 Eglinton Crescent, Edinburgh, 12

Honorary Publicity Manager

Mr. W. H. IVEY, Northbrae, Courthill Street, Dalry, Ayrshire

Honorary Publications Manager

Dr. D. M. STEAD, Esk Hause, Bishop's Park, Thorntonhall, Glasgow

Angus Group Seed Exchange, Hon. Manager

Miss J. HALLEY, 16 Abercrombie Street, Barnhill, Dundee

Honorary Curator of Davidson Slide Library

Mr. R. S. MASTERTON, M.R.C.V.S., Cluny House, Aberfeldy, Perthshire

Honorary Overseas Liaison Secretary

Mrs. K. S. HALL, 93 Whitehouse Road, Edinburgh, 4

Honorary Subscription Secretary

Mr. R. H. D. ORR, C.A., 70 High Street, Haddington, East Lothian

Honorary Treasurer

Mr. JOHN HALL, 19 Coquet Vale, Felton, Morpeth, Northumberland

Honorary Secretary

MRS. I. J. SIMPSON, 48 St. Alban's Road, Edinburgh EH9 2LU

Chairman of the Standing Committee of Group Conveners:
Mrs. D. M. STEAD, Esk Hause, Bishop's Park, Thorntonhall, Glasgow

Chairman of the Standing Committee of Show Secretaries:
MRS. S. MAULE, 578 Lanark Road West, Balerno, Midlothian

Contents

	PAGE
Publications	260
Subscriptions and Postage	261
Some British Ferns and their Cultivation, by Dr. C. N. Page	263
A Collecting Day Above Arolla, by Reginald Farrer	276
Where Have all the Flowers Gone?, by Miss Piera V. Peyrani	294
Conference for Beginners	298
First Interim Rock Garden Plant Conference	299
Show Reports	300
Cyclamen mirabile Hild, by R. J. Mitchell	314
Plant Notes	315
Angus Group Seed Exchange, by Joyce Halley	318
Joint Rock Garden Plant Committee	320
Index to Volumes XII, XIII and XIV	321
Obituary—Dr. C. R. Worth	334

VOL. XIV PART 4 (COPYRIGHT RESERVED) SEPTEMBER 1975

SRGC PUBLICATIONS

THERE is a wealth of information in back numbers of the Club's *Journals*. Current availability and prices are given below. It is now necessary to ask for a contribution to postage costs of 3p per *Journal*, up to a maximum of 45p.

	Price per copy		
Journal No.	*Pence*		*U.S. Dollars*
1 to 6	100	When available	2.60
7 to 8	40		1.05
9	30		0.80
10 to 13	40		1.05
14 to 17	100	When available	2.60
18 to 20	40		1.05
21	60		1.60
22 to 26	30		0.80
27	60		1.60
28	30		0.80
29	60		1.60
30 to 53	30		0.80
54 onwards	40		1.05
George Forest Book	125	post free	3.25

Stocks of the available *Journals* in the 1-35 range (except 9) are becoming low and members who wish to complete their runs should note this. Waiting lists are kept for *Journals* not available now.

The Club will be glad to receive or consider purchase of scarce *Journals* and also copies of "DWARF CONIFERS" by Hillier.

Members who have good runs of the earlier numbers are asked to make provision for their useful disposal when their own need passes.

BARGAIN OFFER

Stocks of *Journals* 9, 39, 42, 44, 48 and 52 are high and until they come down to average level they are being offered at the very low prices of: 2 for 45p, 3 for 60p, 6 for £1.10, all post free to members.

All correspondence about past publications should be addressed to the Hon. Publications Manager:—

Dr. D. M. STEAD,
ESK HAUSE,
BISHOP'S PARK,
THORNTONHALL,
GLASGOW G74 5AF.

Subscriptions and Postage

A PLEA to the members from the Subscription Secretary

MAY I please draw attention to the following:—
SUBSCRIPTIONS ARE NOW DUE ON 15TH OCTOBER (or before) and are for the year to 30TH SEPTEMBER 1976 the same, i.e.:

Ordinary Member	..	£1.50p (U.S. $3.75)
Family and Junior	..	50p (U.S. $1.25)

BANKER'S ORDERS

Postage is now so high that each member who can is urgently requested (if he or she does not already do so) to pay by banker's order. This should be completed, please, and sent to me for a S.R.G.C. reference—there are between 3000 and 4000 members, some with identical initials and names.

PAYMENT OF BANKER'S ORDER will save you postage and is the most reliable method of payment. It also ensures automatic prompt payment.

This year 674 reminders had to be sent out in late Spring. Besides spoiling the best time for fly fishing, it cost the Club £36 in postage alone.

PROMPT PAYMENT as you will now realise would be appreciated by your Subscription Secretary. If you cannot pay by banker's order, then, in order of preference, please pay by crossed cheque or crossed postal order. Some mail every year never gets delivered and if you have paid by cash this cannot be rectified.

PAYMENT IN ADVANCE

This would save you postage and is very acceptable by me. You can pay two or more years in advance, in which case your membership card will show either when the next subscription is due or how much credit you have.

CHANGE OF ADDRESS

As Subscription Secretary, I am responsible for the mailing list, so please let me know your old address as well as the new one. About 20 *Journals* of each issue are returned by the postal authorities. Although

no charge for extra postage has been made up to now when a member has claimed his missing *Journal*, as this is likely to be more than 10p I intend in future to request payment for the additional postage.

Unstamped Letters can be Expensive

I trust that if I should be the guilty party the suffering member will please complain to me. I receive one letter from an overseas member which had a 13 cent stamp but was marked "Air Mail". The postage due came to 26p or 57 cents. Care is requested and, incidentally, some members seem to be unaware that the old penny (d) stamps are no longer valid.

RESIGNATIONS

If you must resign, please notify me in writing as required under Rule 2 before 31st January, otherwise you will be held liable for the year's subscription. Merely stopping your banker's order is just not enough!

COVENANTS

Owing to the extra load of work caused by last year's change of subscription and date due, I have not encouraged members to pay their subscription by taking out a deed of covenant in favour of the Club. I will accept new covenants up to the end of November and again for those who wish to covenant for the year to October 1977 in the months of May to September. On application to me, I will be pleased to send a covenant form which includes a seven year special banker's order for completion. It is possible for arrangements to be made so that seven years' subscriptions can be made with one payment. Covenanting is advantageous to the Club, especially the last method; but should the subscription be increased, the covenanting member may have to augment his subscription. In the original offer to covenanters a special concession was given that, as far as they were concerned, the subscription remained the same for the seven years. It should be made clear that this special concession has been withdrawn.

In conclusion, I wish to thank the many members who are co-operative and patient and pay their subscriptions promptly. I do hope that the quite large number who do not pay the right amount, or at the wrong time, or who do not pay at all, will have read this and will mend their ways. Quite frankly, this year has been very difficult and meant burning the midnight oil. Could you please help, if the cap fits.

RONALD ORR, *Subscription Secretary*

Some British Ferns and their Cultivation

by Dr. C. N. PAGE

The Clark Memorial Lecture given at Edinburgh on 9th November 1974

IN THE British Isles there are about fifty species of native ferns, the majority of which are present in Scotland, and there are probably many foreign ferns which could prove to be hardy in cultivation out of doors. This latter group includes especially ferns originating from the more temperate regions of the Himalayas, Japan, North America, southern South America and New Zealand (which has a fern as its National Emblem). It is thus surprising to find that the number of enthusiasts in Britain cultivating ferns is relatively few, and that their interest is largely concentrated on growing British species and horticultural varieties. How many foreign ferns could be grown successfully out of doors in Britain, there is no complete list, for as far as I know no-one has ever tried to compile one.

The scope for growing ferns, especially in the milder and wetter parts of Scotland, is thus high. The Victorians were, of course, the fern-growers *par excellence*, both of hardy and non-hardy ferns in Britain, and a few old Victorian ferneries still remain. Since then, interest in fern growing has steadily declined, although we still have in Britain an active group of fern growing enthusiasts in the British Pteridological Society, and there are similar fern Societies also in the United States of America and Japan. Each Society produces regular journals on ferns and fern growing and operates spore exchange schemes. The last twenty, and especially the last ten years, have seen a dramatic revival in interest in fern growing in Britain. But this time the interest is not by horticulturists alone, but chiefly by scientists interested in studying what this large and ancient group of plants can teach about plant evolution. Whilst fern growing by gardeners declined, plant collectors gathered and scientists described increasing numbers of species from wild habitats and communities. Then, with the realisation of the potential of these plants for scientific research, fern growing for scientific purposes greatly increased. So today, in Britain we have some of the finest living fern collections in the world.

Although at least 90 per cent of ferns require tropical conditions, over twelve thousand species are known to science, and more are being added every year. The choice for the cultivator, whatever growing conditions are available to him, is thus wide.

I have tried to set down some notes on fern growing based on my own experience, and outlined some of the ferns which can be grown in Scotland. This is not intended by any means to be an authoritative guide to all the cultivation methods possible, nor to all the species. This would need a book. The notes are merely on methods I have found particularly successful from experience of raising and hybridising a wide variety of ferns from many parts of the world. They thus apply broadly to all (the techniques are little different), in the hope that overseas members of the S.R.G.C. may find the points equally applicable. Exactly what ferns can be grown depends primarily on the climate. For those who live in more favourable climates, the choice of species increases enormously.

If these notes do anything to stimulate a wider interest in ferns and in fern growing, they will have served a useful purpose. For further information on fern growing and identification of British species I would like to recommend the following two books:

Kaye, R. "Hardy Ferns" (Faber & Faber, 1968), an authoritative book on practical aspects of fern cultivation and one which also deals with native fern varieties and some hardy foreign ferns.

Hyde, H. A., Wade, A. E. & Harrison, S. G. "Welsh Ferns" (National Museum of Wales, 1969), an invaluable publication which deals with identification of ferns growing in Wales, most of which are also found in Scotland.

Much information both on fern growing and on scientific aspects of ferns and fern allies world-wide can be found in the *Bulletin* and *Fern Gazette*, published by the British Pteridological Society, and available from its Secretary at 46 Sedley Rise, Loughton, Essex, England.

Some General Points of Fern Structure

Most ferns, especially the larger ones, die back completely or at least partially in winter, flushing again with new fronds in spring and summer. A few are evergreen in sheltered situations. In all cases, fronds spring directly from rhizomes which, with very few exceptions such as bracken, grow at or just beneath the soil surface. The rhizomes may be long creeping ones, in which case they give rise to fronds at

intervals, or, more usually, short creeping or short ascending or erect. The latter habit is most common in temperate ferns and allows the crown producing the new fronds to be above soil level and hence free from waterlogging conditions—an essential condition for healthy growth. Here the fronds grow from all sides of the rhizome in a tight spiral succession, new fronds arising from the crowns in the centres of the rosettes made by the older ones. It is the erect rhizome with persistent leaf-bases and an interwoven mesh of roots which forms the trunk of tree ferns which may be up to thirty feet or more in height. Fronds of all ferns grow by uncoiling in crozier-like fashion—often appropriately called by the Americans 'fiddle-heads'.

Fronds may stand more or less erect (as in the male ferns), or lie fairly closely against the surface of the soil forming a rosette (as in the Maidenhair Spleenwort and Hard Fern). The majority of ferns produce only one type of frond, some of which bear sporangia on their undersides in clusters called *sori*. Such sori (singular, *sorus*) may lie totally uncovered on the backs of the fronds (as in the Common Polypody) or, in the majority of species, may be covered by a flap of tissue called the *indusium* which shrivels when spores are discharged. Other ferns produce two types of frond: one green and leafy and the other bearing the sporangia and having the leafy tissue reduced to a minimum (as in Hard Fern). A few others are half way between these two conditions and have some fronds which are partially specialised to bearing sporangia and partially leafy (as in the Royal Fern).

The shape of the indusium (whether, for example, it is umbrella-shaped, kidney-shaped, or a simple flap hinged at the side) is one very important character used in classification of fern genera and families by the taxonomist. Other characters often used in the identification of species and genera include overall habit, size, shape and degree of dissection of the fronds, and the type of rhizome, and more detailed characters such as type of hairs or scales on the frond and rhizome surface, position of the sori with respect to the frond margin and venation pattern, presence and position of grooves on the main and side veins of the frond, the vascular anatomy of the rhizome and frond stalk (*rachis*), detailed features of the sporangia themselves, spore size and ornamentation, and chromosome number.

Some of these features will be mentioned where they help to distinguish particular species.

Growing Ferns from Spores

Ferns have a reputation for being in some way difficult to grow. In general, although there are some difficult (and a few near impossible) species, on the whole this view is totally erroneous. As a non-horticulturist with little previous experience of growing even a blade of grass, I have found little difficulty in raising and growing nearly any fern I have met in many parts of the world.

I attribute this to one main factor. I have grown nearly all my ferns from spores. For, on the whole, ferns do not like being moved —a fact which applies especially to plants growing in the wild, for these seldon transplant successfully into gardens. Hence, perhaps, the reputation. The reason may be twofold:

Ferns are so prone to desiccation (their fronds are thin and they have a high rate of water loss) that any severance of the root system feeding the rhizome is likely to be harmful. Ferns have a mass of extremely fine delicate fibrous roots which spread deeply and widely into minute fissures. These roots break extremely easily if moving is attempted.

By growing ferns from spores we produce an enormous number of individuals from which we can select the best and most vigorous ones. By doing so, we unconsciously select the plants which do best in our particular conditions of cultivation. Such pot-grown ferns can be planted-out later with little root damage so that they soon surpass those of transplanted wild rhizomes. Furthermore, they can be grown in as large numbers as may be required.

Collection of Spores

All mature ferns produce spores, and these can be readily collected by removing whole, or pieces of, sporangium-bearing fronds with ripe spores (usually when sporangia and sori are a rich brown or black colour, from mid-summer onward) and placing in an envelope or specially folded spore-packet to dry. Ideally, spore packets should be folded from a thin smooth-surfaced paper, but not one which is heavily waxed. Dried slowly at ordinary room temperature, spores are released from the sporangia in a few days, and collect at the bottoms of the packets. Once gathered in this way and kept dry, spores of most ferns remain viable for a number of years (the Royal Fern, *Osmunda*, is an exception).

Time for Sowing Spores

Sowing should always be done in springtime. This allows the young plants the lengthening of days of spring to develop, and gives them the maximum growing season for establishment before the onset of winter. Growth of all ferns is most rapid in spring and summer because of the length of day and slows down or stops in winter (even in evergreen hardy species and tropical species kept in a warm temperature).

Preparation of Compost and Pots

Fern spores so collected germinate readily when placed on moist compost. Sometimes sowing on fragments of old broken pot is recommended but I have always found difficulty in later transplanting the young ferns without root damage if sown in this way. For this reason I have preferred to use a compost. I normally use a 3:2:1 ratio of peat:sand:loam, passed through a ¼-in. riddle. The loam is steam-sterilised before mixing (to reduce the number of pathogens and rogue algae, moss and other fern spores), and once mixed is stored in a dark plastic dustbin with a tightly fitting lid. This stops the compost drying out, as it is difficult to wet again. It is very important that no feeding whatsoever be incorporated in the compost, as this would only encourage the growth of algae at the expense of the ferns.

2½-in. pots are made up with a 1-in. layer of coarse sand in the bottom (the same sand as used in the compost) and then filled to within a ½-in. of the rim with compost, loosely tapped down (but not pressed). I generally find clay pots better than plastic, which tend to dry out or waterlog too readily. Clay pots should be steeped in water before sowing.

Once filled, the pots must be covered with pieces of glass or clear plastic. This helps to keep out unwanted pathogens and encourages a high humidity to develop inside. Once covered, the pots should be stood in a ½-in. of water and be left to soak for an hour, until uniformly moist. I always use water previously boiled and cooled.

Sowing

This simply involves scattering some of the collected spores over the surface of the compost. Briefly remove the plastic lid and gently tap a small cloud of spores over the compost in the pot from just above it. Avoid doing this in a draught. Do not sow the spores too thickly—a thin sowing will produce better plants than a crowded one. Add a small plastic label with the name to the pot, replace the cover

and put the whole in a light shaded situation (a north light is ideal). Avoid direct sun on the pot at all stages. Stand in a ½-in. of water whenever the compost starts to show dryness, but be careful not to waterlog the pot and do not water overhead at this stage. This would merely over-compact the compost, sink the spores and waterlog the culture.

Subsequent Treatment

Germination of the spores takes place in a few days, and should be detectable by the appearance of a non-shining yellow-green powdery covering to the compost in 6-12 days. A glistening green covering indicates the growth of a culture of algae instead. The rate of growth of the young plants henceforth varies widely with the species, the season, the temperature, and the thickness or thinness of the original sowing. Typically, young heart-shaped green fern *prothalli* can be seen by the naked eye in 3-4 weeks, and should be mature in 4-8 weeks. The prothalli are the alternate generation to the fern plant proper, the *sporophyte*, and it is from the prothalli that the fern sporophytes arise as a result of *fertilisation* by the plant's own male gametes. These gametes, the *antherozoids*, are free-swimming and mobile and require a film of water in which to reach the female *archegonia* and achieve fertilisation. Hence at this stage it is necessary to water the pots once overhead. Do this when the prothalli are 1/8 to 1/4 in. across. If no young fern plants have begun to appear within a fortnight—try again, as some prothalli do not mature until nearly a ½-in. across. A few, like the golden-scaled male fern, are *apogamous* and will produce young sporophytes without fertilisation at all. If the culture has proved to be a crowded one, maturity of the prothalli will be retarded, and a few should be pricked out and spread apart with forceps, into a fresh pot of compost, set up as before.

As young sporophytes appear and touch the covers, the covers can safely be removed and the cultures watered overhead. When about 1 in. high, the young sporophytes can be pricked out into small pans, and at 3-4 ins. into small individual pots, using the same compost. At this stage many ferns, with the exception of epiphytic ones, will respond well to the use of a general feed. Do not feed epiphytes. Plants can be retained in pots until planted out as opportunity dictates, but this is best done in early spring, just before active growth begins.

Treated in this way, fern plants can be raised by the hundred and be ready for planting out in 1-2 years. This quantity is an advantage

if group plantings are required—a scheme for which ferns are particularly suitable. In 2-3 years, these plants can surpass anything obtained by transplanting mature rhizomes. The majority of species require moisture but not waterlogging, a degree of shade and shelter from extremes of sun and wind, and a soil or rock substrate appropriate to the particular species. Given these conditions, ferns show a wide variety of form which can provide a particularly attractive addition to any planting scheme, especially in shady rocky situations and when rocks overhang water. The pleasure of having raised all the ferns from spores is also a satisfying achievement.

Some Ferns of Limestone Rocks

Most ferns found growing naturally on limestone or other lime-rich rocks are relatively small in size, and hence perhaps are ideal for the small rock garden. Many will withstand some degree of exposure to sunlight, although usually they are most successful in humid, lightly shaded situations. All enjoy a moist but well-drained rocky substrate. Most have short-creeping, ascending or erect rhizomes, and so are not far-spreading. Plants in this category can often be found in the mortar of old walls—a habitat colonised particularly freely by Maidenhair Spleenwort and Wall Rue.

Asplenium trichomanes L. (Maidenhair Spleenwort—fig. 66c) is an attractive small rosette-forming species with narrow serpent-like fronds usually 3-4 ins. long, yellow-green in colour with a shining black midrib. Besides its preference for old walls, it occurs naturally in limestone clints and fissures and in other base-rich situations. Very similar to it, but less common, is the Green Spleenwort, *Asplenium viride* Huds., which differs chiefly in having a green midrib instead of a black one.

Asplenium adiantum-nigrum L. (Black Spleenwort—fig. 66a) has larger, more or less ascending triangular fronds up to about 6 inches high, which are usually shining mid-green above with a black base to the midrib. The plant is chiefly one of rock crevices in the west of Scotland.

Asplenium ruta-muraria L. (Wall Rue—fig. 66d) is a small fern with triangular fronds seldom much more than 1-1½ ins. in length, common throughout Britain on basic rocks and especially on the mortar of old walls.

Ceterach officinarum DC. (Rusty-back Fern—fig. 66b) has fleshy, simply lobed fronds with a characteristic thick covering of brownish or copper-coloured scales on the undersides. It is most common in the south

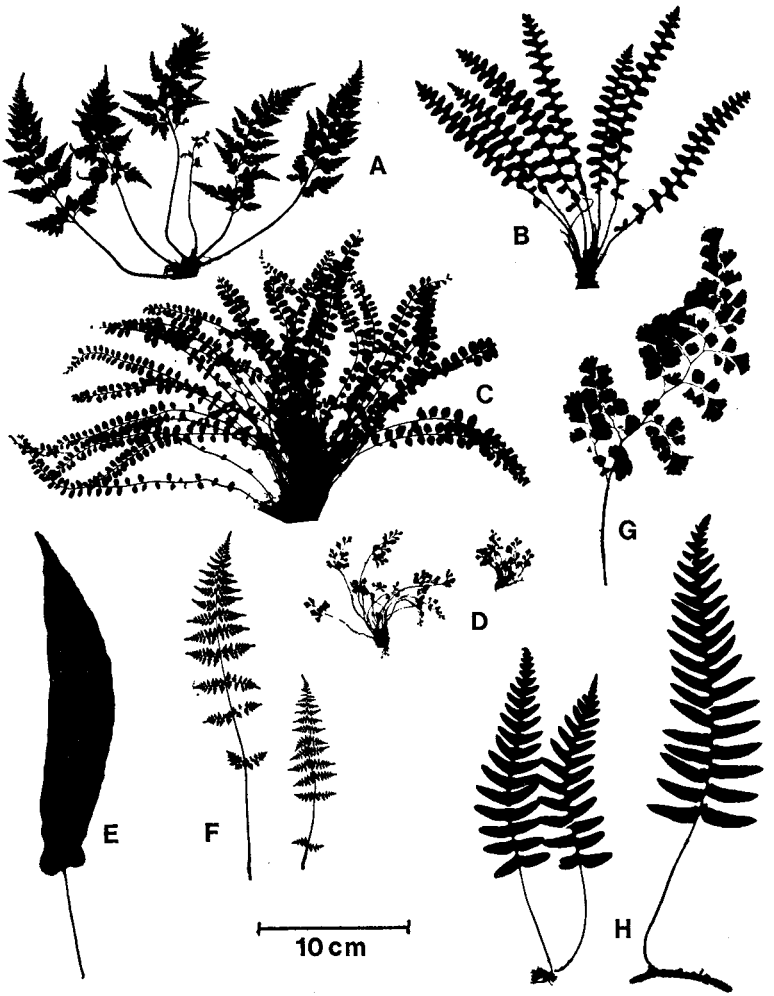

Fig. 66 Silhouettes of some British ferms of limestone rocks

a, *Asplenium adiantum-nigrum* b, *Ceterach officinarum*
c, *Asplenium trichomanes* d, *Asplenium ruta-muraria*
e, *Phyllitis scolopendrium* f, *Cystopteris fragilis*
g, *Adiantum capillus-veneris* h, *Polypodium vulgare*

and west of Britain and is particularly widespread in Southern Ireland. It can withstand exposure to full sun.

Phyllitis scolopendrium (L.) Newm. (Hart's Tongue Fern—fig. 66e) is a particularly attractive fern for cultivation, having bright green simple fronds up to a foot or more in length. It enjoys moist basic situations with a high humidity and shelter, and can be vigorous in cultivation. It is common in limestone areas in clints and fissures, especially in the south and west of Britain.

Adiantum capillus-veneris L. (Maidenhair Fern—fig. 66g) is an especially attractive and delicate species, with a finely dissected bright green frond usually 4-10 ins. or more in height with many fan-shaped segments and a black midrib. It is a rare plant in the wild in limestone clints in milder localities, and would probably need some protection in cultivation in Scotland.

Cystopteris fragilis (L.) Bernh. (Brittle Bladder Fern—fig. 66f) has 4-8 in. finely cut fronds, and is a common fern of damp sheltered base-rich rock faces, especially in the west. It is hardier than the Maidenhair Fern, and seems likely to make an attractive and delicate plant in cultivation, particularly in damp, dark, rocky situations.

Polypodium vulgare agg. (Polypody—fig. 66h) is a slow-growing plant with surface-creeping scale-clad rhizomes giving off 4-12 in. simply pinnate fronds at 1-2 in. intervals. It is widespread in the British Isles, usually growing on rocks (but not always base-rich ones) and can also be found growing as an epiphyte. There are three closely related species in Britain, plus three hybrids. Once established, Polypody is likely to make an attractive rock-garden fern creeping over boulders. It can withstand considerable exposure, although it grows better in moist, sheltered, lightly shaded situations. In common with many epiphytic ferns, Polypody seems to dislike feeding.

The principal non-British fern suitable, on the whole, for more basic situations is *Adiantum pedatum* L., a Maidenhair fern from North America, which has larger fan-shaped segments than the native one, and seems to tolerate more neutral soil.

Some Ferns of Neutral to Acid Situations

Most ferns found in the wild in neutral to acid situations are species of woodland or woodland margins, and tend to be larger in size than

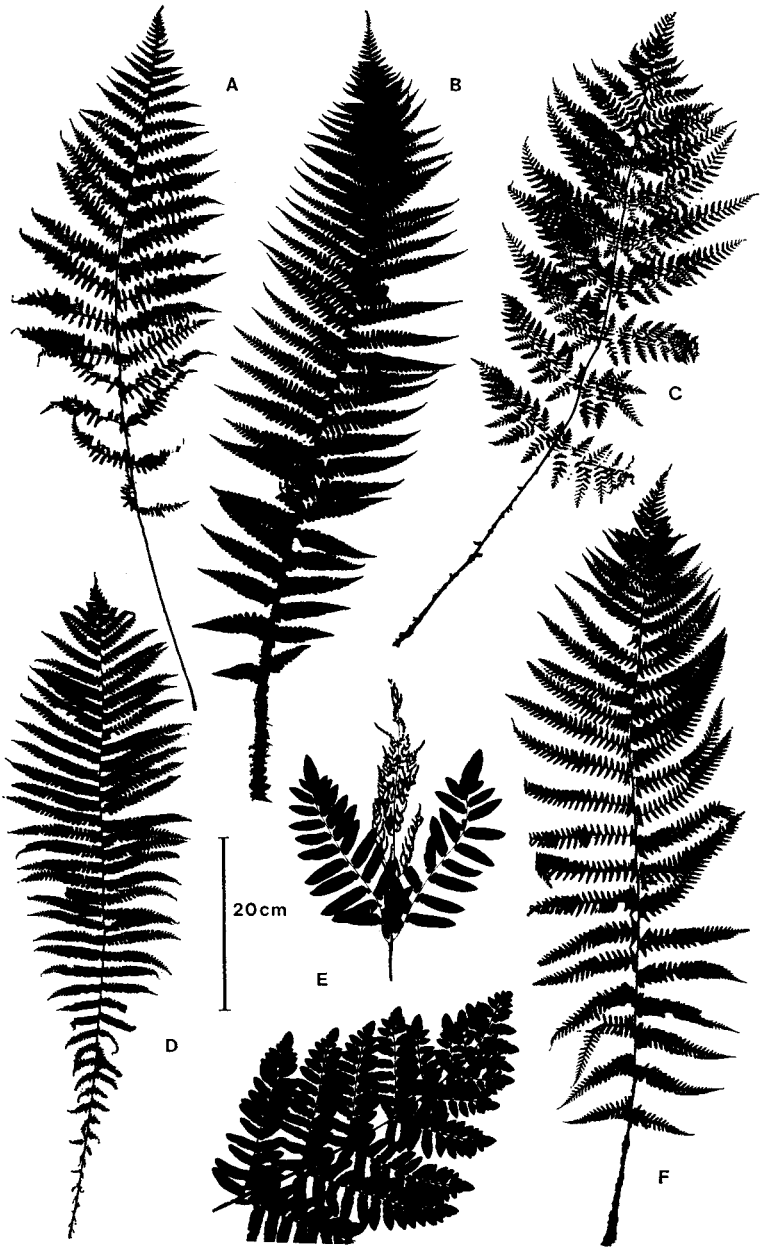

Fig. 67

Silhouettes of some of the larger ferns of neutral to acid situations

a, *Athyrum filix-femina*
b, *Dryopteris filix-mas*
c, *Dryopteris dilatata*
d, *Matteucia struthiopteris*
e, *Osmunda regalis*
f, *Thelypteris limbosperma*

those found in lime-rich situations. Most also grow directly in soil rather than on rock, although are often present in larger rock fissures. Most are vigorous in cultivation and likely to be successful in damp but not waterlogged lightly shaded situations. A few, however, like the Golden-scaled Male Fern, will withstand full exposure. They are thus plants suitable for the larger rock garden or as a backdrop, where they are especially suited to group planting, and can look particularly attractive overhanging water.

Dryopteris filix-mas (L.) Schott (Male Fern—fig. 67b) has large semi-erect fronds up to 2-3 ft. or more in height, and is one of the commonest species in Britain. Its near relative *Dryopteris borreri* Newm., Golden-scaled Male Fern, differs principally in being slightly smaller and having a yellower green frond with golden-brown scales cladding the base of the midrib. Both are especially frequent on open hillsides in the Highlands, often in large numbers.

Dryopteris dilatata (Hoffm.) A. Gray (Broad Buckler Fern—fig. 67c) has finely dissected broadly triangular fronds up to 2-4 ft. or more in length and is a particularly common species in woodlands throughout the British Isles. *Dryopteris aemula* (Ait.) Kuntze (Hay-scented Buckler Fern) is superficially similar, but its natural distribution is more restricted to the west. Both seem suitable for shady sheltered situations with rich damp soil.

Polystichum setiferum (Forsk.) Woynar (Soft Shield Fern—fig. 68d) and *Polystichum aculeatum* (L.) Roth. (Hard Shield Fern—fig. 68e) are both somewhat similar to the Male Fern in appearance with rather narrow semi-erect fronds, but these are more finely divided and have spinulose margins to the pinnae. The Soft Shield Fern is more common in damp rocky woodland sites in the south and west of Britain, whilst in the north the Hard Shield Fern more or less replaces it in most localities.

Polystichum lonchitis (L.) Roth. (Holly Fern—fig. 68g) is a rare plant of Scottish mountains. It is a smaller version of the last two species, with conspicuously spinulose-margined fronds 4-8 ins. in length.

Cryptogramma crispa (L.) Hook. (Parsley Fern—fig. 68a) is another rare species with finely-cut parsley-like fronds. It occurs in mountain scree and succeeds in similar situations in cultivation.

Fig. 68

Silhouettes of some of the smaller British ferns of neutral to acid situations

a, *Cryptogamma crispa*
b, *Thelypteris phegopteris*
c, *Blechnum spicant*
d, *Polystichum setiferum*
e, *Polystichum aculeatum*
f, *Gymnocarpium dryopteris*
g, *Polystichum lonchitis*

Gymnocarpium dryopteris (L.) Newm. (Oak Fern—fig. 68f) is a particularly attractive spreading species with fronds which are very broadly triangular and usually 6-8 ins. in length, whilst *Thelypteris phegopteris* (L.) Slosson (Beech Fern—fig. 68b) has similar-sized fronds, less finely cut. Both are plants of upland woodland in Scotland, and enjoy a high degree of shade and shelter.

Athyrium filix-femina (L.) Roth. (Lady Fern—fig. 67a) is an attractive and variable species with remarkably finely dissected semi-erect fronds 1-2 ft. in length. These vary from pale lemon-green to deep green in colour, and may have a reddish midrib. Plants are common in acid situations throughout upland Britain, especially near water. It seems vigorous in cultivation.

Blechnum spicant (L.) Roth. (Hard Fern—fig. 68c) has simply cut (herringbone-like) blue-green shining fronds, the vegetative ones of which form a basal rosette in the centre of which the fertile ones arise later in the season. Like Lady Fern, this species enjoys particularly acidic peaty situations and is common near water in upland Britain. Plants seem tolerant of considerable exposure.

Thelypteris limbosperma (All.) H.P. Fuchs (Mountain Fern—fig. 67f) is superficially somewhat similar to Male Fern in size and appearance, but is a species of relatively sheltered ditches and other wet acid places throughout upland Britain, and is common in the Highlands.

Osmunda regalis L. (Royal Fern—fig. 67e) is a particularly large and characteristic species, mature plants of which may form massive clumps. It is rare in most of Britain, though it occurs widely in south-west Ireland where it is a plant of wet acid situations along lake margins. It is hardy, and a particularly useful and attractive plant for damp situations at the waterside.

There are probably many non-British ferns suitable for growing in neutral or acid situations in Britain. I list below a few which I have seen well established in gardens in Scotland. *Blechnum penna-marina* (Poir.) Kuhn is a smaller version of our native Hard Fern from the sub-antarctic islands, which can thrive here in soil rich with leaf litter. *Blechnum tabulare* agg. from southern South America is a much larger member of the same genus with fronds 1-2 ft. or more, and can be vigorous in milder parts of the west. *Dennstaedtia punctiloba* (Michx.)

Moore is a useful plant with fronds 12 ins. or so and creeping rhizomes adaptable to a wide range of soils and exposures. It comes from North America. *Hypolepis millefolium* Hook. from New Zealand looks somewhat similar to the last and it is also adequately hardy in Scotland. *Onoclea sensiblis* L. (Sensitive Fern of North America) succeeds well in damp ground in Scotland where the soil is humus-rich, and in similar situations *Matteucia struthiopteris* (L.) Tod (Ostrich Fern from central and northern Europe—fig. 67d) has established itself so well in Scotland that it now occurs as a naturalised escape in some parts of the west.

A Collecting Day above Arolla[1]

by REGINALD FARRER

IT IS always with a sense of approaching the most boundless botanical possibilities that one penetrates into the mountain valleys southward of the Rhone. For there, high in each secluded glen, dwell species that scorn the crowded slopes of the Oberland. In the Saasthal, in the uppermost screes, lives *Campanula excisa*; in the Turtmann Thal *Linnaea borealis* meanders through the mosses of the woodland; in the Val de Bagne *Saxifraga diapensioides* huddles passionately into the inexorable sun-baked precipices of the Pierre à Voir. And with these specialities grow also all the commoner glories of the Alps, so that, for one ambitious to collect in the hills, and unable to go so far afield as the Tyrol, the mountains of North Italy, St. Martin Vesubie, or that gardener's Eden the Col de Lautaret, no more profitable advice can be given than that they should put money in their purse and fare hopeful forth to Saas-Fee, Meiden, or Arolla.

At Arolla, indeed, I had my first experience of these tributary valleys of the Rhone. For the wanderer's guidance I may mention that opposite each notch in the vast mountains overhead that wall in the bed of the Rhone three thousand feet and more beneath, there sits in the flat lands over which the great river flows, a little town, with a

[1]This material appeared as a chapter in Reginald Farrer's book "Alpines and Bog-Plants", published in 1908. Since only few copies were printed it will be unknown to many members. It must be realised that taxonomists have changed many of the names of plants in the interval.—*Editor.*

station on the railway. Thus, immeasurably far above the tiny hamlet of Turtmann hangs the opening of the Turtmann Thal, and Sion, Sierre, Martigny, each corresponds with the gap that opens up towards the terrific snows above. By false guidance, however, I alighted one steaming afternoon at the wrong station, and had two hours to wait before a train would take me back to Sierre, whence, it appeared, you climb dizzily up the rampart of the mountains until you come into the Val d'Hermance, and so, past Evolena, to Arolla.

Few situations of life can possibly be more overpowering than the valley of the Rhone on a hot afternoon in July. It is so very large, so very flat, so very hot—and, above all, it is so straitly bounded, in front and behind, by so crushing, so annihilating a wall of mountains, which in their turn—oh horror!—are divined, even from the depths, not to be themselves the pinnacles of the world's roof that they appear, but mere subordinate pedestals to the real snow region above, whose awful teeth appear here and there as one raises one's eyes to the distances overhead. The first part of the journey from Sierre, however, is made luxuriously by carriage, and it is wonderful in what serene majesty the mountains open up before one as one goes, no longer made terrific by personal fatigue. For, in a carriage, somehow, one loses that appalling sense of utter personal insignificance, minuteness, nonentity, that always paralyses me when first I set my lonely feet on the austere territory of the hills. In a carriage—and a carriage for which one has to pay—one feels once more in comfortable relations with the world into which one has been born and bred, the world of amenities, humanities, personal importance, where one's mortal personality has its place, and where the gaunt enormous hills are not actors in a fearful superhuman drama, but a mere painted *mise en scène*, a pleasing background to the human comedy.

In long loops, curling and curling upon each other like the rings of a vast python, the white road mounts over pleasant slopes of shelving vineyard, orchard, corn-strip, towards the upper valley. Here and there amid the golden stubble gleams the profound velvety sapphire of *Delphinium ajacis*, a rare cornfield weed in England, parent of our multicoloured, lovely annual Larkspurs, and one of the consecrated plants which have their name from sad memories of strength and beauty vanished long ago, for whose disappearance the tears of earth are shed eternally—for Aias, for Adonis, for Hyacinth. Sheer below us, far below, lies the valley of the Rhone—the broad river looking ridiculous and undignified in such a bird's-eye view, with its worm-like

wanderings, the mapped spaces of its meadows, its fringe of toy poplars, its punctuation of little toy villages, each with a toy church perking in the midst. Away to the left and passing out of sight, the depths are blocked by the fairy palaces and temples of Sion on its crags; and as one mounts higher, so does the opposite barrier of mountains grow every minute more high and wide and awful, broadening and swelling at each step, as the eye, dazed by their prodigious mass, follows the line of their development till it ceases in the snowy spires away towards the St. Gothard.

And from this height one feels the double influence of the two colour schemes that fill the Alps. Far away below, the valley of the Rhone lies dreaming in gold and golden green, a soft territory of sleep, with the sleepy blue thread of the river running through. Everywhere as one looks down, there is green and the kindred tones of green, while the depths of the air themselves are swimming with a dust of infinitesimal gold in the sunlight. And then above, abruptly, begins the dominance of blue. Long slopes of pale cobalt, soft indigo falls of forest, then the high and naked sweep of sapphire, fading into distance after distance of serrated colour, far up against the gentle azure of the sky, across which, in the rosy haze, huge curling ranges of cloud go soaring in shades of coral, ochre, amber. Here and there in front of their denser volumes, the pinnacles of the mountains are violet, scarred on this side and that wih the rich white of distant snow, while the peaks round the St. Gothard reverse the process and are all of warm, rosy ivory, set with irregular jewelled ridges of amethyst, against the faint pink and purple of the thunderous cloud-masses behind them, a score of miles away. And the whole prospect, beautiful beyond our poor mortal comprehension, is on so vast a scale of grandeur, so inhumanly immense, so contemptuous of such dear human details as roads, towns, railways, that every time one meets it at a turn in the loop one gasps anew with shock, as under a sudden deluge of icy water.

But at last the shoulder of the hill is turned, and we say farewell to the valley of the Rhone. Now the road continues directly up the Val d'Hermance—for we are here, by kindly fate, still in French-speaking Switzerland.

To describe the vein-system of the Swiss waters one must adopt the most severely scientific terms. In fact the venation of the Swiss rivers is perfectly pinnatifid—at least, I trust, I am right, as well as impressive, in so explaining it. In milder words, the arrangement of valleys is as follows: there is, first of all (to put the cart before the horse, for the

sake of clearness), a great and first-class river, such as the Reuss, the Aar, the Inn, the Rhone, flowing down a deep and broad valley that it has carved through the mountains. This valley lies quite low as regards sea-level, and is fed by contributory streams that come in at right angles from secondary valleys high up in the hills on either side. In their upper reaches it is the habit of these to flow along a fairly level course, and then to achieve their final descent into the main body by a series of crashing leaps that disposes of the two or three thousand feet they may have to descend in about a quarter of a mile. A notable instance is the Reichenbach, which foams imperiously enough down from Rosenlaui, and then takes its leap to join the Aar in the most imposing of Swiss waterfalls. (For its rival, the Handegg, offers no such *coup d'oeil* as the Reichenbach, slinking down in all its volume through the concealment of a cañon, with an unmanly coyness as indecent and grotesque as if Moses were to coquet behind a fan.)

The Rhone and the Aar flow among cultivated lands and cornfields, their tributaries from above through the dense pine woods. But these tributaries, in turn draining the lower mountain-mass, are fed by yet other streamlets pouring down at right angles again from the open fell above—(and thus, roughly speaking, parallel with the big river five thousand feet below). And then again, these very streamlets from the upper barrens have carved glens for themselves between the topmost ridges, and are nourished by little filaments of water, trickling down from right and left from innumerable gullies and screes in the high snows. Thus, from ever higher and higher, one stream is perpetually flowing at right angles into another, until you reach the last faint runnels that have been washing the feet of *Ranunculus glacialis*, or carrying vigour to the opening gaze of *Eritrichium nanum*. I hope I have sufficiently shown that the water system of the Alps is perfectly pinnatifid?

The drive up the Val d'Hermance is beautiful but without event. There is only the one great thing to see at the end of the valley, far up beyond invisible Evolena. Now on one side goes the road over open lands and past sun-beaten banks aglow with the rare yellow Ononis. Then loom into sight a row of poetents—enormous, big-hatted monsters aligned across the way. These are the Pyramides d'Euseignes. Water, it seems, has in the interminable course of years eroded all this valley. But certain huge stone blocks have sheltered the light friable tufa on which they rested; with the result that each block stands up, like a gigantic toadstool, on a tapering twenty-foot spire.

And here these fantastic mushrooms rise aloft securely on their stems, and bid fair to outlast the valley, and grow taller as its soil is washed away. Only man has ever been successful as their enemy. Some perverted mind once conceived the idea of using the pyramids for targets in gun-practice. Popular indignation, however, stopped the irreverence before much damage had been done.

After Euseignes the road crosses to the other side of the valley, and mounts and mounts. At a dizzy depth below, by the foot of the precipice, the river brawls downwards over its rocky bed. The roadway is a mere wringle on the face of the cliff. Overhead, as the air clears, hardens, deepens to the cold calm of sunset, the high snows begin to appear, chill and sombre above the last pines. But neither precipice, nor pyramids, nor yellow Ononis can hold one's attention for long against the dominant presence of the Val d'Hermance. For one has not been bowling for long through the upper valley before one comes into sight of its reigning deity. Snow here, snow there, high overhead, is our right; we expect it. But snow is one thing, ordinary white teeth of mountain are one thing; the Dent Blanche is quite another. Away, away at the uttermost extremity of the valley the mountain-spire leaps into sight, and the unrelenting majesty of it is like the blast of trumpets. As I have already said, all these secondary streams flow from some big mother-peak, and these mountain glens end always in a pre-eminent height of snow. The Val d'Hermance is formed like a Y, and while the right-hand branch brings a stream down from Arolla and the Mont Collon, the left arm is called the Val d'Hérens, and descends immediately from the Dent Blanche. And at the junction of the Y stands Evolena, where the traveller may spend the night.

It was on a blazing morning that I set out from Evolena for Arolla, up the steep valley to the right, upon whose bare slopes of grass a pitiless sun was beating. There is nothing but a track after Evolena, so that one must either walk or jog it on a mule. Where, in the lower valleys, it is a question of tramping endlessly upwards through sweltering forests, I myself prefer the mule as the least unpleasant of unpleasant ways to achieve a necessary piece of drudgery. (This may sound irreverent. Remember that I speak as a gardener. Opulent as the pine-woods are, they give a gardener very little of interest. And no one will deny that they can be stuffy and hot to an infernal degree.) But from Evolena, standing so high as it does, only desultory fringes of woodland are to be feared on our upward way to Arolla. So that with an un-

daunted heart one can set out to walk the six miles or so that lie between the two.

Very soon one has to say good-bye to the Dent Blanche, which passes out of sight as one diverges from the Val d'Hérens. And it is almost with relief that one escapes from that overpowering presence. All ranges and peaks seem to me to have a personal character of their own. Indeed, this is inevitable. Since all things organic and inorganic, all rocks and mountains and trees must ultimately become Buddha, perfect and unchanging, it follows that, of these enormous pilgrims in the road of salvation, some must be farther advanced on the way than others—that all must, in fact, have personalities of their own. And, far down in the scale as the rocks must be, the Dent Blanche is surely farther down than many of its rivals. The Matterhorn, arrogant and terrible, has splendour and generosity; the Wetterhorn is obviously good-tempered; Mont Blanc and Mont Rose are two stout and cosy dowagers, Mrs. White and Mrs. Pink; even the Weisshorn has in its beauty an energetic fury that suits well with a pilgrim on the Way—although that energy be sometimes turned to evil. And Fuji-yama is surely not so much mountain as Bodhisatta. Very near the close of its journey is Fuji-san, and no one could be surprised to discover, some morning, that it had faded out during the darkness, and passed away in the Peace, which is Nirvana. But about the Dent Blanche there is a cold and sluggish malice, unsleeping, unhasting, which owns no kindred with the stolid, fund-holding respectability of Mrs. White, the fierce nobleness of the Weisshorn, or the divine tranquility of Fuji-san. The Dent Blanche, as far as hills can have a heart, has an evil, unfriendly heart, which is very far indeed from learning that Love Catholic, which is the way of Release. The Dent Blanche, indeed, has beauty for its only merit, and therein lies its salvation. For it is unorthodox folly to say that handsome is as handsome does, and that plain faces can hide lovely souls. If the soul be lovely, the face must have its beauty too, by the law of inevitable consequence, that we call Karma, even though that beauty be rare, exotic, hard to see. And, on the other hand, nothing beautiful can ever be altogether evil, since beauty can only co-exist with inner loveliness, or the possibility of inner loveliness, no matter how remote, how deeply buried in vanity, malice, and frivolity. And therefore, in the enormous course of years, there is as sure an ultimate hope for the beautiful Dent Blanche as for any beautiful man or woman who has ever followed desire through selfishness and treachery. For in the very fact of outward beauty lies

the promise of inward good. The seed is there, though many a load of soil must be cleared away before the Great Light can penetrate its husk and ripen it to germination.

Over the sun-trodden slopes of grass the mule-track mounts to Arolla. The scant, browned herbage wavers in the heat. Little lizards pant in ecstasy on the burning stones of the low wall that skirts the cobbled ascent. A hot fragrance of life and flowers throbs round one as one goes, and from each burning surface of rock rise on stiff, sticky stalks the rosy star-clusters of *Sempervivum arachnoideum*. Rosy I call them, and rosy they are in our pale air, but there, in that blaze, they are fire-red, glowing, incandescent. And their mats of round rosettes, too, are silver white with dense tomentum. In England we can rarely hope to see the bloom as brilliant, the little balls as snowy with down. The heat it is that achieves both miracles of beauty, and my climate, to speak for myself alone, has no friendly torridness for the Houseleeks. They live—oh yes, they live—and even thrive in a pallid way, but never do they attain the solid silver, the intense glow, that transfigured them on a sun-baked slope of Switzerland. My wet winters martyrise them, my uncertain summers perplex and bore them. On one rock, indeed, in the Old Garden, I had once *tectorum, arachnoideum,* and *laggeri* thriving excellently. Then my manager and I read Clarke's book on Alpines, put our heads together in a pious and humble spirit, and, as the author warmly enjoined, planted all our Sempervivums anew in a mixture of clay and cow-manure. With the result that they unanimously languished and expired.

All the Sempervivums, in fact—and they are legion; I might consume pages in analysing and noting the minute differences that make up the two hundred species or more that are cultivated—are sun-worshippers of the purest Zoroastrian zeal. Of them all, *arachnoideum,* with its lovely variety *transalpinum,* is my favourite. *Tectorum,* our English Houseleek, is good and useful. Not far off are *triste, wulfeni, reginae-amaliae. Rubicundum* is smaller than these last, rare, and very rich in colour, the whole rosette being deep ruby-claret. But of the larger species the finest, to my taste, is the rather uncommon *gaudini* from the Southern Alps. The rosettes of this are big, ball-like, clear green, and furry with innumerable small bristles. It sends out babies on long feelers, and carries a stout head of lemon yellow flowers like Catherine-wheels. *Gaudini,* too, thrives here far better than most of its kindred, and in more ordinary soil. *Sempervivum calcaratum,* if what I have is true, and not confused with *calcareum,* is magnificent in

size and shape; and *laggeri* is a charming wee thing, half the size of little *arachnoideum*, but otherwise similar, with the same downy white globes. For all these—at least in the rainy North—I advise as little soil as possible, some mere crevice in a rock with a pinch of earth, exposed to every ray of sun, and as little troubled by rains as you can manage. And if you wish to specialise on Sempervivum—and you could have no worthier subject—there are Houseleeks beyond number, as the sands of the sea, all more or less casuistically differentiated from the species I have mentioned, which represent the typical beauties of the race,—dainty and delightful as is every other Sempervivum that has ever been glorified with a name to itself.

The way grows hotter as it mounts, and there is no stick or twig of shelter. The heat seems almost too much for all flowers except the Salamander-hearted Sempervivums, for the only thing which the slopes above Evolena yielded me was a single, narrow, purple spike of *Campanula spicata*. But erelong the way leads on into a scattered woodland where *Campanula pusilla* runs riot over the sun-dappled stony slope between the rare trees. In light and shade it thrives equally, and under the lee of every stone its little china blue-bells dance lightly on their almost invisible stems.

It was here, just before the trees began to thicken, that I found the dainty silver-pale variety that I call *pusilla pallida*. Pallid is a word with evil connotation, and I am sorry I chose so dishonouring an epithet for so exquisite a colour as the silvery French-grey that you get in this form of *Campanula pusilla*. Then the path passes wholly into dense shade, and skirts a mossy boulder as large as a young church. After that it emerges and moves through endless vicissitudes —up and down, in and out of meadow and woodland, peaceful and pleasant to pursue. Somewhere in these parts is to be found, so M. Correvon tells me, the very rare, tall yellow Valerian *Hugueninia tanacetifolia*, but alas! I never saw it, though it frequents damp, mossy corners where such rank splendours as *Lactuca alpina* are to be met with.

The great excitement at this part of the ascent is one's first sight of the Arolla Pine. About all waning, dying species, such as *Saxifraga florulenta*, *Lilium krameri*, *Campanula allioni*, there hangs a flavour of almost Stuart romance; but *Pinus cembra* is the protagonist of nature's tragedy in the Alps. Only in its young stages could the tree possibly be mistaken for anything else. As it grows older it develops a dense, club-like shape, which enables you easily to distinguish its dark, stout

columns from several miles away, amid several thousands of its rival species. *Pinus cembra* is probably a very ancient species. It is certainly very slow-growing, and, I believe, not in the front rank for fertility. In any case, it is being crowded out of the world by younger species. In the Valais it lingers, in Tyrol, and in Siberia. You first sight it when half-way up the path from Evolena to Arolla, in the Arolla valley, and after that it goes with you all the way to the glaciers at the foot of the Mont Collon, becoming the reigning tree as you get higher. Though in the past it has suffered fearfully from the prodigal destructiveness of the peasants, movements are now on foot to establish plantations of *Pinus cembra* in favoured places (at Bel-Alp, I fancy, among others), so that its approaching extinction may perhaps be retarded indefinitely. For the forester and landscape gardener *Pinus cembra* has no value; for the rock-garden, on the other hand, its slow growth and its dense habit give it very high merit. As a wind-break it acts admirably, and, for general use, ranks only second to the genuinely, permanently dwarf *Pinus montana.*

Even at Arolla itself you do not escape entirely from the forests, which still linger above you to the right. But the way becomes more open as you advance, skirting shaggy slopes of long grass and summer flowers. Not here, though, can *Campanula barbata* be seen in such unexampled splendour as in the meadows above Meiden. There its Campaniles seem taller, its great, fringy bells larger, more numerous, more shaggy, more blue than anywhere else in the Alps. I have already praised this plant; now, deliberately, I must say that my praise was altogether insufficient for its merits. *Campanula barbata* is one of the most perfectly lovable plants that lives. No other epithet is so apt. Other things are more flamboyant, other things are more startling in their colours, but very few plants in the garden have the gay pleasantness of *Campanula barbata,* the serene, large-hearted charm. Last sight I had of it, I remember, was abloom with all its usual generosity in the depths of London, on a rock in the Physic-Garden at Chelsea.

But if the way to Arolla is not famous for *Campanula barbata,* in revenge, the sunniest, driest slopes are ablaze with the coralline loveliness of evil-tempered *Dianthus sylvestris,* most ungrateful of plants. But, indeed, the Pinks are a difficult race; I am reminded, by my memories of Arolla, that certain seedling Pinks, of which I held out great hopes in *My Rock-Garden,* as due to bloom that year in unheard-of loveliness, turned out, after all, to be dull, fringy dowdies of a most vapid and milky description. These came to me under such high titles

as *cinnamomeus* and *pruinosus*. Only *cinnabarinus* failed to bloom, and so, most likely, to disappoint. The postponed disappointment, I already fear, is no less certain than the bloom.

And so, past copse and meadow, the track leads on and on, until at last we come to the Mont Collon Hotel itself, sitting lonely at Arolla (which is only a name) above a marsh full of *Saxifraga aizoides*. And in front of this there is nothing but the gaunt, promising desolation of stone stretching up to the feet of the Mont Collon, whose vast bulk closes in the grim little valley. To the right rises another big humped mountain, the Pigne d'Arolla, carrying a few sparse old specimens of *Pinus cembra* on its rust-coloured screes. But the hotel stands on the fringe of the last woodland, and the other slope of the glen is clothed rather with copse and tangle of *Pinus montana* than with any more notable tree. High and high above all this stretches, against the blue, the saw-line of the mountain-ridge, so fiercely planned as to be hardly patient of any snow. Midway stands up the Aiguille de la Za, a stark pinnacle like some gigantic saurian's tooth, no less waspish and deadly than its hissing mosquito-cry of a name. Standing there before the hotel, as darkness gently cools the air of the mountains, a gardener alone will understand perhaps how the heart of a gardener bounds to think that he has escaped the fertile, unprofitable land of meadow and forest, that he has come at last to the territory of great open spaces, of that illimitable, gorgeous desolation, which is the home of so much brilliant beauty, such enormous peace (fig. 69).

The tutelary deity of the Arolla valley is *Androsace imbricata*. And for the *Androsace* you needs must go very high up into open spaces to which the open space below the Mont Collon is a crowded jungle. Looking out across the acres of stone, grim evidence of altitude, that stretch before the hotel, it is hard to realise that only far and far above all this do you come into the real openness, the real freedom of heart and soul and eye. The upward way leads you first of all across the rocky wilderness, where little dwells but *Sempervivum montanum*, and then across the stream, along whose further bank it continues for some time a mild ascent, beneath the shadow of a precipice. *Sempervivum montanum* need not detain the searcher. It is a rather undistinguished little Houseleek, with lopsided rosettes of pale green, and heads of sad murrey-coloured Catherine-wheels. So, unheeding the small fry of the mountains, one pursues one's way upwards in the grateful shadow of the cliff. *Campanula pusilla* is rampant everywhere, the immense violet bells of *Campanula scheuchzeri* glitter imperially wherever water distils,

on wet rocks *Pinguicula* lifts its purple Gloxinia-blooms above its flattened star of viscid, carnivorous leaves, and everywhere *Saxifraga aizoon* shows its stout little creamy spires. Only in the moraine garden shall we ever be able to achieve the full charm of *Saxifraga aizoon*. On rock-work, in cleft and border, it has high value and charm indeed, but set it thickly on a slope built only of small limestone chips, and there, alone against that background of broken stone, so lovely in its innumerable lights and shades, its tones of lilac, white and grey, will you get the full effect of the Saxifrage, its tidy masses of blue and silver rosettes, the serried solid blooms in their rounded spikes on abundant, sturdy stems.

I have already sufficiently lauded the easy temper of this group of Silver Saxifrages, but their pictorial effect is apt to be undervalued, owing, as I myself have too readily admitted, to the dull or greenish tones that sometimes damage the brilliance of the flowers, as seen against the uncompromising background of English rock or English soil. But at last I learned my lesson one day below the Laemmern Glacier on the Gemmi. From a lawn of purple Pansy, snow-white dazzling *Ranunculus alpestris*, and the amazing blues of *Gentiana bavarica* and *Gentiana favrati*, I came suddenly, unexpectedly, on a high steep shoulder of broken limestone. The whole surface of the ground was covered with white chips, and everywhere, over its expanse, rose crowded colonies of *Saxifraga aizoon*, gently waving its sheaves between the gorgeous violet stars of *Aster alpinus*, while *Biscutella laevigata* made showers of pale gold at intervals, and the hot orange of *Senecio doronicum* blazed here and there against the cool soft silver of its leaves. And to harmonise the whole there were frail, rare grasses, plumy, cloudy, that shivered among the flowers. And there, in an instant, I learned the full decorative value of *Saxifraga aizoon*.

But here, on the way from Arolla to the Plan de Bertol, *aizoon* is abundant enough on the stones. Sometimes the blooms are heavily peppered with crimson dots; sometimes they are almost pure in their white; sometimes dull and stodgy. And then, all at once, my companion—why should I conceal that this was M. Correvon himself?—darts forward with a cry. There, on a flat rock, thick-set with its ordinary kindred, shines before our eyes the long-sought yellow variety of *Saxifraga aizoon*! Though not brilliant, this yellow—it is quite clear and soft and pure—is very easily distinguishable among the duller tones around.

In my rhapsodies over *Eritrichium* I have touched on the gardener's

joy of discovery. This has a quality which can belong to few other successful quests. For what can equal the delicious moments while one sits down in glory at the side of one's discovery, and finds the moments far too holy and precious to be cut short by the premature introduction of the trowel upon the scene? The thing is there, for us to deal with at our reverent pleasure; meanwhile we must adore every detail of our find, lovingly touch the upturned petals, mark the growth, the health, the beauty, the whole delight of the plant. There is no hurry about precipitating the end. So there, on that flat rock overhanging the precipice, we loiter in worship of the yellow *aizoon*; then, when our satisfaction has been fully savoured, the trowel is introduced, cunningly and with piety, so as to remove only a little fraction of the clump—Anathema sempiternal on those who would rend away the whole, and leave the rock widowed of its chief pride! And this, again, is generously divided, that finder and companion may share alike. So we go happy onwards, secure in our knowledge that every rosette and rosettling of these Silver Saxifrages is safe to make a solid little plant by autumn.

Now the track, having passed the precipice, suddenly takes it into its head to mount. And mount it does, with fire and fury, in abrupt, violent zigzags, over a slope as steep as the side of a house, and surfaced with fine herbage, polished and slippery as glass. So quickly goes the climb towards the upper levels that gigantic Mont Collon, now close at hand to our right, seems to sink down beneath us as if through a trap-door. Up and up and up curls the track, still in the shadow of the hillside. The grass is starred with little plants of *Silene rupestris*, and the dark sapphire globes of *Phyteuma pauciflorum*. Here and there occurs the one-flowered form of *Campanula barbata*, which, so far I have never proved constant in cultivation. Then, high above, solid rock, reddish, granitic, begins to loom overhead. The track reaches it. Now we are on the terriroty of *Androsace imbricata*. *Androsace imbricata* is within reach—perhaps even within sight. But the keenest search fails to discover any of those expected silvery cushions nestling into crevices of the cliff.

So our upward way continues. Suddenly there is nothing more above us. In another instant we have topped that long dark slope, and emerge, dazzled, into the full glare of day. Up and down before us lie unrolled the lawns of the Plan de Bertol—one golden fire, in the sunlight, of *Geum montanum* and other little yellow glories of the grass. Looking back across the invisible deep gulf beneath us, we seem on a level with the midmost snow-patches of Mont Collon itself. Our vast,

sun-flooded tract of colour is closed on the right by a barren wall of mountain. To the left, high above us, stretches a huge amphitheatre of granite cliffs, from whose feet a wilderness of broken stone flows away down towards the grass. A moraine—ice and stone and glacier-mud and water—mounts beyond this from the stream's head to the head of the glen, and on the right, above other stone slopes, a snow-field, daunting, cold, and azure (for the sun has not yet touched it), leads upwards to the Col de Bertol. Now I know that my quest is achieved, for, all around that amphitheatre is a classical station for *Androsace imbricata*. Meanwhile my companions are more eager to scale the Col de Bertol, whence, from the Hut, the climber is rewarded by a view over the Val d'Hérens to the Dent Blanche. I, for my part, having no love for snowfields in themselves, prefer to spend my day in the more placid delights of the Plan de Bertol. Accordingly the others depart on their way, and I am left alone.

To be alone in wide, great places is sometimes too terrible a thing for little mundane man. In the high valleys of the Alps, where the silence is so vast that it seems as if a single uttered word would shatter the roof of the world, the nearness of the Gods is either purifying or appalling, according to one's strength of mood. All the Lords of Life and Death, all Gods and Saints, all Buddhas and Bodhisattas out of the infinite past and the infinite future, they are all there, making part of that immeasurable beauty, chanting in the choir of that eternal silence, incarnate in the radiance of that unstained mountain sunlight. They are the irresistible Powers of the air; the lucid diamond air is THEM. So that, if one be strong enough, from hours of solitude in upmost Alps, one can drink big draughts of immortality, can leave behind for a wholesome hour the unrealities of earthly life, and lose consciousness of the phantom daily self in reunion with the divine eternal Self.

However, if such a mood be not upon you, be careful how you venture into the mountains. Be careful how you go there accompanied by unworthy thoughts, petty ambitions, hopes and fears. For the pure Spirits of the hills are not patient of such affronts, and they will have none of such thoughts in their presence, nor of you that bring them. You will be unhappy in such august neighbourhood—feel ill-attuned, unwanted, disliked. In such a mood, or when weakness and the love of human comradeship is upon one, let us stay happily at the Schweizerhof, or parade the streets of Zermatt. For the terror of the hills is dreadful, cold, annihilating. It strips man of his dignity, denies his

Fig. 69—Above Arolla Photo—W. H. Ivey

existence, reduces him to an ineffectual ghost, a mere ἀμαυρόν εἴδωλον of his decent Bond Street entity. On level lawns in the Alps I have felt a spiritual terror so glacial and overpowering that I have scarcely been able to put one trembling foot before the other. Not, for a moment, that there was anything tangible or obvious to fear for one's bodily safety in the way of cliffs, glaciers, crevasses, but simply that my spirit, on those days, was too little to cope with the universal Godhead of the world, too fast-riveted in egoism to sink itself in the divine personality. On the other hand, there are days when one is more worthy of that divine companionship, capable of losing one's self and becoming God. And, on such a day , loneliness among the hills is strengthening and sacred.

Nor does the beauty of the place go for much in one's feelings. I don't know that the Plan de Bertol is particularly beautiful, beyond the intoxicating loveliness of clean, empty air, of uncontrolled light and space. Yet there I felt solitude most blessed, whereas high up on the Col that leads over Meiden to St. Luc, in surroundings far more dazzling, and with the dizzying magnificence of the Weisshorn ruling all the mountain world, I yet was glad of companionship; felt the whole thing a magnificent painted scene, stood far outside it, without desire for solitude or closer communion.

Over the grassy knolls of the Plan de Bertol one wanders on, trampling the golden glow of *Geum montanum* as one goes. The close lawn becomes a carpet of colours—Pansies, Primulas, Gentians make its tissue. Then comes the streamlet, dancing down among the glacial buttercups from the stony moraine above. On this, in the sodden blue clay between the blocks, one comes on plants of *Saxifraga biflora*, drenched and draggled with mud. And here, too, though we are in full granitic formation, I came on one plant of *Campanula cenisia*. As for *Rancunculus glacialis*, it is everywhere, now, in wet places among the shingles. Its large, solid flowers shine white as snow, and in the course of years each unit has developed into a solid clump of a hundred plants or so, each separate crown, almost, carrying one of those gleaming brilliant blossoms, waxy-pure against the gold of their stamens, except where the fertilised flowers are fading to a dim, sad pink. And then, joyous find, comes an isolated mass of *Geum reptans*. *Geum montanum*, the golden Mountain-Avens, is a common little glory enough, quite dwarf and vigorous, with bright yellow flowers as large as a florin. And this, in cultivation, is as thrifty and easy a thing as you could have for any sunny rock-work or raised border—healthy,

spreading, floriferous—though in cultivation its stems shoot up to six inches or so. But its big cousin, *Geum reptans*, is very different in every respect. You are generally very high on the last moraines of all before, far ahead of you, on the unbroken grey of the stones, you see a sudden flare of gold. As almost all flowers except the smallest and dullest are now left behind, you cannot imagine what the yellow vision may be. It is *Geum reptans*, making one compact colony at that point, and not occurring again over the whole moraine. It is much bigger in growth than *montanum*, the pinnate leaves standing erect, and the whole plant reaching eight or ten inches in height. The flowers are, I think, the most magnificent in all the high-Alpine flora, from the point of view of combined brilliancy and size. They conquer even *Aster alpinus* and *Senecio doronicum*—great golden St. John's Worts they are, as large as a crown-piece—yes, and much larger, too. From the stock each parent-plant sends out a thin pink runner like that of a strawberry, which produces a young growth. Thus the species multiplies, yet stays perpetually in the same spot.

In cultivation, unfortunately, *Geum reptans* is uncertain. It lives perfectly well, even multiplies, with some success. But it very rarely flowers. I am convinced, though, that it will prove (I haven't yet tried it so, but mean to this season) a first-rate moraine plant, since what it obviously requires is to be kept awake by sheer starvation, in the thinnest, rubbliest scruff of stone and grit, instead of being allowed to sink into sybaritic sleep in rich garden soil.

Crossing the moraine at last, one sets oneself to climb towards the sun-steeped granite cliff on which one hopes to find the Androsace. As a matter of fact, there is no such delirium of excitement about this present quest as there was about that of *Eritrichium nanum*. For there all was uncertainty—the place, the moment, everything. Now, on the contrary, I know for absolute fact, that in those baking cliffs overhead I shall soon be seeing *Androsace imbricata*. And sure enough as I clamber up the last steepest slope to the foot of the precipice, I see the treasure before me immediately—three or four powder-white balls of down, wadded immovably into a crevice. Immovably indeed. Nothing can I do to stir them. Gently as you urge them, they resist indomitably. Pull them, and they break at the neck. It is true that in a covered frame of moist sand, shaded, with plenty of air, you can strike cuttings of many difficult things, such as *Eritrichium* and *Androsace*, as easily as Violas; but the pious collector's instant ambition is always to get perfect roots. So I quest along the face of that amphitheatre, beneath

a daunting heat beyond words to express, and nowhere do I discover a single amenable plant of the silver Androsace. From every chink its little cushions leer out at me in derision; but in the face of abundance, it seems I must ironically starve. Finally, having perlustrated the whole semicircle, I retreat baffled, and drop down to the moraine again, to eat my four Marie biscuits to the accompaniment of glacier water. Fortified by this repast, however, I decide after lunch to make another effort to secure my lovely prey. I mark a certain little jagged tooth of granite far overhead, standing aloof from the main amphitheatre, or rather its last desultory outcrop. There, if anywhere, the rock looks rotten and friable. I set myself a-climbing. Steep is the rocky slope, in all conscience, under the sun. But it is nothing to the space beyond. For here, the tension of the hill's angle relaxing for a couple of hundred yards or so, enormous boulders are heaped and piled in the loosest and most distracting confusion. They are the size of little houses, these blocks, and one's only progress is to climb laboriously up one, then drop into dismal depths on its further side, and so up the face of another. And so on, and so on, and so on, until one feels like an ant in a sugar-basin. At last, however, I reach my little jag of rock, and there have the joy of finding my hopes justified. For the cliff is quite loose and disintegrated here, slab lifting off slab in the easiest and most delightful way. And between these two separable slices, *Androsace imbricata* in abundance makes the jam of this 'satisfying sandwich' (alas that there is no one present to finish the tag 'and broach the exhilarating marsala' in honour of the occasion!). Delightedly, then, I lay bare the whole ramification of its silky roots, and take a fair proportion of plants, blameless in my certainty that I am doing them no wrong, but giving them as fair a chance of thriving as any collector's skill could offer. And so, at last, as the sun's majesty goes westering and the air glows with a ruddier gold, my companions are seen far-off, black specks on the snowfields, and when they rejoin me on the Plan, we all continue our rejoicing homeward way together, almost too deeply sated with success to feel more than a passing thrill when, not half a mile from the hotel, as we return along the path, *Aquilegia alpina* is seen nodding two of its glorious blossoms at us from a bush.

The ascent on the right from the Arolla Hotel takes one on to a different geological formation, which produces astonishing differences in the flora. *Androsace chamaejasme* is replaced by *A. obtusifolia. Aster alpinus* is abundant in the higher reaches, with *Ranunculus pyrenaeus* and *Androsace carnea*; and of larger things the big gentians are

very abundant, every possible hybrid of *purpurea* occurring in every conceivable shade of colour, from dull tawny to claret.

Androsace carnea is a pretty treasure, whose merit has been obscured by the greater merit of his major *eximia*, and his minor *laggeri*. The type *carnea* is a thin and wiry-leaved species, quite dwarf, with a head of rather pale little Primula-flowers. *Eximia* has much broader, solider, glossier leaves, with bigger flowers, more abundant, and of a much deeper pink. The type, however, is very well worth growing, and, with *eximia*, has the strong recommendation of being perfectly easy to grow, quite trustworthy and robust, preferring a light, rich peaty soil, and needing no glass protection in winter, as do the downy-leaved species from the higher Alps and the Himalya. In point of fact, the cultivator can always tell the easier Androsaces by the fact that their leaves are thin, leathery, and devoid of down.

Another in this blessed category is *A. vitaliana*—sometimes called *Aretia vitaliana*—pardonably, too, as it is so unlike the other Androsaces. It makes a prostrate mat of dark green, furry branches, and then emits a quantity of brilliant golden-yellow flowers, in shape and almost in size recalling those of *Jasminum primulinum*. This plant, though perfectly easy and safe in any soil and any decent aspect, must yet be bought with caution. There is a thin-leaved, sparse-blooming, small-flowered form of *A. vitaliana*; and there is also a stalwart form, with leaves slightly broader, more robust-looking, hemmed with a ciliation of white down, which produces a splendid abundance of big flowers, whose colour is of the richest, softest, imperial yellow. Do not overfeed *A. vitaliana* with too rich soil, and you will never have any complaint to make of him.

There are some other noteworthy species, too, in the *carnea* group. *Brigantiaca* makes larger rosettes, but is otherwise very similar, with bigger heads of rather pallid pink flowers; *hedraeantha* is much more brilliant, yet broader-leaved, with flowers of a fine rose. This is a novelty, hailing from the Balkans, and both species are quite decently easy in any fair cultivation. I have *hedraeantha* in the moraine, where it throve splendidly for a time, and will probably do so again as soon as it has recovered from the oppressive attentions of a mouse.

All these rosy Androsaces, of course, would be even more beautiful than they are—this is horrid ingratitude, but also truth—if they did not have that faint, faint lilac-magenta tone which so frequently interferes with the purity of colour in the Primulas and their near relations —of whom, of course, Androsaces are about the nearest. *Laggeri* is,

by many lengths, the best of its kin, a tiny version of *carnea*, so minute in growth that its spreading tufts might be taken for those of some small *Hypnum*. However, it soon enlightens you as to its charms by sending up a dozen little stems or more, each crowned with a head of golden-eyed rosy flowers, the most brilliant of all their kind—if you except the impossible *glacialis*. *A. laggeri* loves a warm, loose bank of gritty peat—at least, it does here in a moist climate, and is a lovely treasure beyond price—especially as, being a wiry-haired species, it needs no apparatus to ward off winter-rain.

Androsace lactea is a link between the others, and the annual and biennial species. It is, as a matter of fact, very pretty; and yet, so very misrepresentative of the name it bears that I can never love it quite as much as it deserves. It has big rosettes of smoothish dark green leaves, and sends up the most admirably floriferous stems of bloom, carrying large, pure white flowers, in graceful great loose umbels. It is a sound-hearted, thrifty, good-natured plant, thriving almost anywhere, even in more or less shade—a condition, I find, generally fatal for Androsaces. (They say *A. laggeri* will also do in shade; well, it may; but I have always found that every single one of the genus prefers sun.) It is truly perennial, too, and goes on blooming all the summer in a very delightful, pleasant way. I am doing all I can for the poor dear, after so frankly owning that I cannot pay it the debt which I admit I owe. I respect it deeply; love no one can command, and *Androsace lactea* is too like the dreadful little annuals and biennials for me ever to feel quite fond of it. As for them, they too have neatness and floriferousness. But, with one or two dazzling exceptions, such as *Linaria alpina*, and *Gentiana nivalis*—if anyone could ever get it to grow—I regard all annual plants in the rock-garden as out of place. They are frauds there, come in on false pretences. Your true alpine is a sturdy soul, who battles with the vast elemental forces of life for half a score of years; —not a little, frivolous ephemera that grows up in a month, and flowers and seeds and dies all in a summer. So away, briefly, with *Androsace filiformis, coronopifolia, chaixii, raddeana, septentrionalis*, and their synonyms. They are all pretty, mind you—some of them very pretty indeed; but I personally happen to have that prejudice against annuals or confessed biennials—my dazzling exceptions being only species that are too cogently beautiful to be left out—*Linaria alpina, Ionopsidium acaule, Saxifraga cymbalaria*—(I don't say this is cogently beautiful, or that I want it; but it came, and where *Saxifraga cymbalaria* comes, it comes to stay). Therefore I'll commend these annual Androsaces

generously, but I won't grow them.

Some of them don't even bear commending, either. A few years ago I got seed of an Androsace called *macrantha*. I bought it because the name sounded so alluring. A big-flowered Androsace, bless me, what a joy! Who would have suspected a trap? But up came the seed, so thick that I at once smelled out a disappointment; it is only weeds that germinate so eagerly. The seedlings grew like Jonah's gourd, and then appeared the spikes that were to bear the eponymous big flowers. Well, that plant bore the smallest flowers I have ever seen, and in the most enormous calyces. Beware, then, of *Androsace macrantha*, all ye that have Greek! And as for that rarest of Italian new-comers, *Androsace mathildae*, I have not yet tried it, feeling a presentiment that it belongs to the not too easily distinguishable cousinhood of *A. wulfeniana* and *A. ciliata*.

As for propagating; the high Alpines may, with great care, be raised from cuttings struck in moist silver sand, duly shaded. All the *sarmentosa* group may be pulled to pieces at pleasure, and every piece will grow;—a little more care, please, with *villosa* and *arachnoidea*. Most of the others can be divided with ease, and *lactea*, with the annuals, of course, comes profusely from seed. Raising the rest from seed is hopeless unless the seed be fresh, and, even so, is doubtful, slow work, though ultimately, perhaps, a gain.

Where have all the Flowers gone?

by Miss PIERA V. PEYRANI, Turin

YES, WHERE have they? I often wonder.

The object of the present article is not to solve the problem, but only to relate the experiences of a garden amateur in what one would imagine the ideal setting for an alpine garden.

It was sixteen years ago when I started mine in the Cottian Alps. It was my third—2300 square yards at 3300 ft. on a wedge between two mountain streams. All round, tops over 10,500 ft. cause an almost constant breeze to blow from 11 a.m. to 5 p.m., and make the spot as dry as possible, notwithstanding the evaporation and consequent heavy dews from the waters below. Being a slope from S.E. to N.W., perfect

drainage is assured. Half the ground had been untilled from time immemorial and looked and felt like coffee dregs—a real dream.

By a list I made at the beginning, no less than a hundred different species, a gamut of wild beauties, seemed to thrive easily, from the early tiniest form of *Eranthis hyemalis* to the late *Colchicum autumnale.* So I thought it a good number to start with.

Hail is unknown and rains are rather scanty from June to the middle of August. Then the weather breaks and one can reckon on an almost daily shower after 4 p.m. Still, by the middle of August or a week before, mildew appears, despite spraying. Apart from the voles, so greedy for my bulbs, I can complain of no pests. The area is protected for many square miles. Birds rid me of insects and I don't mind if they peck at my cherries. I get a good help from a band of hares, which I am told dance by the full moon during my long winter absence. When the snow is three or four feet deep and food is scarce, they gnaw at the bark of my fruit trees, including even the poisonous bark of *Cytisus laburnus.* As a compensation they leave me a good amount of welcome manure. Owing to the rather large area of the ground for an elderly single-handed person, I let three quarters of the flora go wild. Where the soil did not look ideal I added a large quantity of sphagnum found in the woods and two lorry loads of conifer bark and chips from the local sawmill. I found the bark, together with peat, a very useful mulch for keeping the soil moist—and very economical too. I remarked the fact that roots cling to bark as they do to tufa. The latter could be had just for the gathering across one of the streams, but I had not the means to carry it owing to the relatively high weight. Then I began to gather seeds in the neighbourhood to enlarge my plant collection. At that time I was ignorant of the existence of the Scottish Rock Garden Club.

I was not always successful. One of the first failures I met with was *Globularia cordifolia,* so plentiful and apparently so easy, even growing along the roadside. I sowed it several times but never obtained a response. More failures with *Gentiana cruciata, Gentiana lutea, Dryas octopetala* and *Pulsatilla alpina.* Going back to *Globularia,* the road was tarred and *Globularia* disappeared, though it can still be found, together with *Armeria montana,* some specimens of *Carlina acanthifolia* and *Carlina acaulis* var. *caulescens* struggling for survival against coarse grasses.

Referring to both *Carlinas,* there was a boom in dried flower arrangements recently and plants were plundered by the hundred. I

am told they flower every seventh year and consequently the loss was terrific.

One of my own *Carlina acaulis*, already extant on the ground, still grows under a *Pinus nigra*, whose branches are now so long that the little plant will soon be smothered.

There was quite a family of Crocuses in a ditch at the foot of a retaining wall. I lost them long ago and I cannot account for their disappearance.

Hyoscyamus niger and *Berkleya macrocephala* are probably not what I should call precious or beautiful plants, but I liked to keep a specimen of both. Last summer (1974) was so dry that they failed to flower. The same for *Hyssopus officinalis*—the wind, the lack of rain and the position were all against one of my best bushes. The same plants across the stream and facing South fared no better.

Years ago I promised a friend we should find heaps of *Lavandula spica* (?) in a secluded valley. When we reached there not a plant was to be found. What was the cause? I cannot make any supposition. Higher up the same valley there was what I call the largest field of *Delphinium consolida* ever seen. In summer the field was ploughed. *D. consolida* could not set seeds and it was lost for ever. *Clematis tangutica* used to occupy every empty space in the neighbouring village, Bardonecchia. Cottages were built and goodbye to *C. tangutica*!

Trollius europeus, Gentiana verna, Narcissus pseudonarcissus were a feature together with *Linum montanum* and *Primula farinosa.* They used to populate a favourite track of mine so thickly that it was often impossible not to tread on them. A new road was opened and all went amiss. Once more it was the work of man. Progress?

Building the road changed the course of three rivulets along which grew *Pinguicula alpina, Orchis militaris, Myosotis alpestris, Atragene alpina* and others. Very little survived of that show as the ugly new road drew too many pseudo-tourists.

Another secluded track flanked with *Lilium martagon, Geranium montanum* and *Tulipa sylvestris* met another path where, in full shade, one could find *Aquilegia montana* and *Atragene alpina* hidden in the thick dark green.

Even the ever-present *Saponaria ocymoides* was disturbed by a quarry and took refuge on the dirty steep banks of the railway.

Across my road there were plenty of *Chrysanthemum arvense* (?) which made plants three feet in diameter. I measured one in my garden where it received moisture and fertilisers. The spot on which they grew

was moist. The water was canalised and the *Chrysanthemums* vanished in a couple of seasons. At two hundred yards from my site the field was incredibly thick with *Muscari botryoides*. The ground was sold and ploughed to build two cottages. *Muscari* disappeared together with a variety of yellow chives so good in a salad.

Parnassia palustris and *Gentiana ciliata* will be very scarce next year as the seeds cannot have ripened in the very cold September we had in 1974. Raspberries are not flowers, but I used to gather a lot twenty minutes from my cottage. Now I am lucky that I have my own. The same for edible mushrooms. Too many people go in search of them, gathering them without leaving a bit of root. I am glad they are so kind as to grow under my conifers!

Dianthus alpinus and *Dianthus carthusianorum, Pulsatilla vulgaris, Linum montanum, Myosotis alpestris, Pinguicula vulgaris, Erysimum sylvestre* and *Soldanella alpina* still grow and flower here and there far from the paths where cars cannot reach, but how long will they last? There could be more and more cases to be mentioned, but it is sad enough to consider how the local flora has dwindled and vanished in the last sixteen years.

The counterbalance is rather scanty in my garden. The winds brought one seed of a sweet white orchid, *Cephalanthera longifolia,* to an unusual spot, the foot of a *Syringa vulgaris.* It was a delightful discovery to see the little flower quite by itself. I hope it will stay. *Malva moschata* and some *Papaver rhoeas* were welcome gifts from an unknown garden. But what strikes me more is the consideration that out of a dozen adult conifers bearing seeds, in so many years only two plants have sprung up and are thriving. One in a fresh spot under a group of conic Junipers, and that I can understand. But the other is at the top of the moraine of pure gravel from an excavation. The place is where the winds rage the highest. This *Pinus nigra* never receives water except from the sky or from the drips of a nearby washing line. Really a most incredible, curious, impossible place for a seed to germinate! It is now 5 ft. high. How strange are the ways of Nature and often so different from the ways of humans!

Summing up the experience of these sixteen years I would say that Man is the worst destroyer of the ecological equilibrium. Nature acts ever so unpredictably but with the ups and downs of rains and droughts she causes only the fittest plants to survive. Let us bow our heads and never act athwart her ways.

Conference for Beginners

ARE YOU a rather new Member who doesn't know how to begin and hesitates to ask for advice? Then this is for you.

A residential Conference for Beginners is to be held on 3rd/4th April 1976, in the Dunfermline College of Physical Education, Cramond Road North, Edinburgh 4.

The aim is to help novices over the first hurdles in Rock-gardening. The number will be limited to 40 and there will be ample opportunity to discuss your problems with each other and with the speakers. The Programme, which is outlined below, has been planned to cover the basic essentials and to enable you to get more enjoyment out of your hobby.

'The Answer lies in the Soil', by Ben Barrett, well-known to radio listeners

'Rock Garden Construction' by James R. Aitken of Perth

'Plants and Places', practical advice from Mrs. S. Maule, Mrs. J. Stead and Ross Kirby of the R.B.G. staff

'Simple Propagation', by Dr. & Mrs. I. Simson Hall

The Librarian will show a selection of useful Books, and the President will lead a visit to the Royal Botanic Garden

The College is modern and has comfortable single bed-sitting rooms, with facilities for making tea or coffee in each Hostel. The inclusive cost from lunch on Saturday to tea on Sunday will be £7.30. Members from a distance who require a room for Friday or Sunday nights may book this when registering.

Owing to the limited numbers any Member who wishes to attend should apply as soon as possible, enclosing remittance of £7.30, to:

The Registration Secretary,
Mrs. KIRSTEEN SCOTT,
51 CLUNY DRIVE,
EDINBURGH

No applications can be accepted after 1st March 1976.

First Interim Rock Garden Plant Conference

SEATTLE, WASHINGTON, U.S.A. **July 18-22, 1976**
VANCOUVER, BRITISH COLUMBIA **July 23-25, 1976**

Theme: "ALPINES OF THE AMERICAS"

Pre-Conference Tours: (Optional) 2 or 3 day Field Trips to:

(1) Olympic Mountains (2) Wenatchee Mountains
(3) North Cascade Mts. (4) Olympic Rain Forest & Mountains

Conference Programme: SEATTLE

Lectures: Plants and their habitats in North and South America (Penstemons, Bulbs, Ferns and other subjects)

Field Trip: To Mount Rainier

Garden Tours and *Educational Displays*

VANCOUVER, B.C.

Lectures: Woodland Plants of North America
Cultivation of North American Alpines, etc.

Garden Tours: U.B.C. Botanic Gardens. Van Dusen Botanic Garden. Private Gardens.

Post-Conference Tours: (Optional) Gardens of Victoria, B.C.
Field Trips to Olympic Mountains, Hurricane Ridge.

The Conference will take place in the University Campus at both centres.
Accomodation: Seattle, Single Room $6.50, Double $4.50 per head per night, excluding meals. Vancouver: $15 per head, including meals, per day.

Registration Fee: $50 includes all lectures, garden visits, Receptions and Field Trip to Mt. Rainier. Banquets extra.

Pre- and Post-Conference Tours: the cost has not been received at time of going to Press, but there should be more information by the time this appears in print.

Travel: In 1975 the return fare to Vancouver is about £145. The whole party must travel out together, but it should be possible to return in 3, 4 or 6 weeks, which will allow members to make other plans if they wish.

Anyone who is interested in going and is not already on the mailing list should write for further information, enclosing stamped addressed envelope, to Mrs. I. Simson Hall, 93 Whitehouse Road, Edinburgh EH4 6JT.

Show Reports

EDINBURGH AND MIDLOTHIAN

THE SHOW was held in the Horsa Hut, former Royal High School Buildings, Regent Road, on Saturday 22nd March. This is the second year this Show has been held, incorporating the Penicuik Show with the Edinburgh Show, and as last year it was a great success. The benches were very colourful, a welcome sight after a long dull winter. The quality of plants has never been higher and one member remarked that he had never seen so many excellent plants in a Show since the International Show in Harrogate—high praise indeed! Nine Certificates of Merit were awarded. Thanks are due to our exhibitors, some from over the Border, Ayrshire, Glasgow and Aberdeen, but regrettably not many from Edinburgh.

The Corsar Challenge Trophy was won by Mr. D. Livingstone for 3 pans primula (who also won the Reid Rose Bowl for the highest pointage in Section I). Dr. J. E. G. Good, Bonnyrigg, and Mr. G. Kirkpatrick were second and third in this class. Mr. H. Esslemont won the class for 3 pans of rock plants of distinct genera with splendid plants of *Draba mollissima*, *Primula allionii*, and *Hepatica* x *media* 'Ballardii' (*Anemone transylvanica* x *Hepatica triloba*) with beautiful pale lavender coloured flowers.

The Elsie Harvey Memorial Trophy, 3 pans Rock Plants, new, rare or difficult in cultivation, distinct, was won by Mr. Eric Watson of Newcastle, with 3 pans of these temperamental beauties the Dionysias. They were *D. aretioides* 'Paul Furse' (fig. 70), smothered with yellow primrose-like flowers, which also won him the Forrest Medal (the first time it has crossed the Border), *D. viscidula*, a very rare one with pink yellow-eyed flowers, and a really tricky one, *D. michauxii*, which also got a Certificate of Merit—quite a triumph for 3 plants. Second in this class was Mrs. S. Maule, Balerno, with *Fritillaria gibbosa*, *Dionysia tapetodes* and *Eritrichium argentium nanum*, the North American cousin of the European one; this was also awarded a Certificate of Merit. Class 4, 1 rock plant new, rare or difficult in cultivation, was won by Mr. H. Esslemont with *Dionysia tapetodes*, second Mrs. E. Ivey, Dalry, with *Saxifraga florulenta*, and third Mrs. Maule, Balerno, who showed that small charming 'woolly' *Celmisia philocremna*.

The class for 3 pans of plants suitable for the rock garden, chosen from Amaryllidaceae, Hypoxidaceae, Iridaceae and Liliaceae, distinct

was won by Mr. H. Esslemont with three *Fritillaria* spp., including the colourful *F. michailovskyi*, with pendant bells, dark reddish purple and a bright yellow top. Mrs. S. Maule was second with *Tulipa humilis*, *Fritillaria* sp., and *Narcissus watierii*, the beautiful small white-flowered narcissus from the Atlas Mountains. Class 8 for 2 pans, as in the previous class, was won by Mrs. S. Maule with two *Fritillaria* sp. and the one pan class as above was won by Dr. D. C. Graham with an attractive greenish-yellow Fritillaria. Crocuses, Tulips and Cyclamen were well represented.

Class 13 for 1 pan Iris was won with a beautiful pan of *Iris winogradowii*, brought to the Show by Mrs. M. Harbord from the garden of the late Major-General Murray-Lyon, who in the past had shown so many good plants. A Certificate of Merit was awarded to this plant.

The one pan Dionysia class was won by Mr. Garth Merelie of Newcastle with a superb plant of *D. curviflora*, which also won a Certificate of Merit. Class 26, 2 pans primula, any group, went to Mr. H. Esslemont with *Pp. allionii* and *allionii alba*, both in full flower. Mr. D. Livingstone won the one pan Asiatic class with a fine pan of *P. bracteosa*. Mr. J. R. Johnstone showed a superb plant of *Saxifraga oppositifolia alba*, a plant not often seen at our Shows. This also won a Certificate of Merit.

The class for 1 pan dwarf Coniferae had 8 entries and was won by Dr. D. C. Graham with that interesting New Zealand conifer *Dacyridium laxifolium*.

The class, 2 pans Ericaceae or Vaccinaceae, first prize went to Mr. Malcolm Adair, Glasgow, with a superb entry, *Kalmiopsis leachiana*, which also was awarded a Certificate of Merit, and *Cassiope* 'Muirhead' smothered in flowers and at the peak of perfection. The class for 1 pan as above was won by Mrs. S. Maule with *Epigaea intertexta* 'Aurora' (*asiatica* x *repens*). The second and third prizes for the same class were both awarded to the sweet smelling *Arcterica nana*, to Mr. D. Livingstone and Mr. Malcolm Adair respectively. A magnificent *Rhododendron leucaspis* was winner in the one pan rhododendron class, shown by Dr. D. C. Graham, which was also awarded a Certificate of Merit. The dwarf Shrub Class was won by Mrs. E. Ivey with the lovely *Lithospermum oleifolium*, well flowered.

It is interesting to note that plants which used to be shown in the 'new, rare or difficult' class are now shown in other classes, thanks to the skill of the exhibitors. The class for cushion plants show specimens that have graded up from being 'thimbles' to 'Cushions'. This class

was won by Mr. J. D. Crosland with a beautiful *Raoulia eximea*, and a smaller one got second prize for Mr. D. Livingstone. In contrast to the other two, third prize went to Mrs. Ivey's *Gypsophila aretioides caucasica*, a hard dome of tiny leaves.

The Bhutan Drinking Cup, awarded to the exhibitor of the best species Primula in the Show, was won by the Regius Keeper, The Royal Botanic Garden, Edinburgh, with a pan of *Primula sherriffae*. This must be one of the most beautiful primulas in cultivation, and it was a pleasure to see this lovely exhibit.

The Boonslie Cup, awarded for a Miniature Garden, was won by Mrs. E. H. Hart, Edinburgh, with a well planted garden which included *Saxifraga oppositifolia*, a tiny salix and *Armeria caespitosa*.

Mrs. S. Maule won the trophies awarded to members exhibiting who reside in Midlothian and Peebles: the Midlothian Bowl and the Midlothian Vase, for the highest pointage and the best plant respectively.

The Kilbryde Cup was won by Mrs. J. Sleigh for a very attractive arrangement of Spring rock garden flowers and foliage.

SECTION II

(Open to Members who have not won a Medal or Trophy at any previous S.R.G.C. Show)

This is the section the Show Secretaries like to see well filled, for the exhibitors are the future showers and growers!

The Henry Archibald Rose Bowl, awarded for 3 Rock Plants, distinct, of generally easy cultivation and grown in the open ground, was won by Mr. D. Herkes, Bonnyrigg; his entry consisted of *Primula bracteata*, *Saxifraga* 'Elizabeth' and *Polygala chamaebuxus* var. *purpurea*, a good trio. Second prize was won by Mrs. J. A. Murray and Mrs. Edith Lawrie was third. Classes 51 and 52 were also won by Mr. D. Herkes. Mrs. E. Lawrie won first with a fine plant of *Rhododendron leucaspis* in Class 59. Mrs. E. Lawrie also won the Bronze Medal for most points in Section II.

SECTION IV (not for competition)

A selection of plants from the Himalayas and Nepal was shown by Mr. Eric Watson of Newcastle, most of them not yet in general cultivation. A lot of interest was shown in this exhibit. In the same section Mr. K. East had instructions for making small troughs, and had the materials necessary for their construction and also brought a

finished and planted up specimen. We are also indebted to him for a beautiful collection of coloured photographs of flowers and butterflies which decorated the hall, and which he kindly put up and which many people enquired about and admired.

The trade stands are always an attraction to the public and add interest to the Shows, and it is easy to buy a plant straight from the stalls. The three Trade Stands were:
Ponton, The Gardens, Kirknewton; Edrom Nursery, Coldingham; and Miss Alison Home, who had pleiones and dried flowers for sale.

Last and by no means least the Show Secretaries thank all the willing helpers without whom we could not stage a Show. Also the exhibitors, many of whom come a considerable distance with their plants, and without whose skill, trouble and work there could be no Show, and to the Judges who also give us of their time and expertise. we also give thanks.

S. MAULE
B. B. CORMACK

NEWCASTLE UPON TYNE

DESPITE a mild winter in the North East, a number of exhibitors from the South had to battle their way up through snow blizzards; those who came from over the Border found road conditions more amenable.

The Show, which was held in the Memorial Hall, Ponteland, Northumberland, by the S.R.G.C. and the A.G.S., was organised this year to A.G.S. rules and therefore the Farrer Medal was available for award. This award, for the best plant in the Show, was made to *Dionysia aretioides* 'Paul Furse' which was exhibited by Mr. E. G. Watson, the Show Secretary (fig. 70).

The Gordon Harrison Cup, for the best exhibit in Class 35, 3 pans Rock Plants, distinct genera, was won by Mr. G. Rollinson of Holme Firth, Yorkshire, with *Androsace imbricata*, *Draba polytricha*, and *Primula* 'Linda Pope'.

Mr. R. A. Hodgeson of Stokesley, Middlesbrough, won the Cyril Barnes Trophy for the highest aggregate of points in Section C, which was a considerable achievement considering that it was the first Show at which he had exhibited.

The R. B. Cooke Plate, a new award, was won by Mr. M. Northway for the highest aggregate of points in the open section. He was awarded,

in addition, an A.G.S. Medal for the best exhibit in Class 1 for 6 pans with a size limitation of 30.5 cm (12 ins.) in diameter.

The A.G.S. Medal for the 6 pans in the open section with a size limitation of 16.5 cm (6½ ins.) was won by Mr. D. F. Mowle of Lancaster, the competition in this class being extremely fierce. The judges, Mr. A. Evans, Mr. W. Tubbs and Mrs. Peggy Fell, awarded an extra A.G.S. Medal to Mr. E. G. Watson for *Dionysia viscidula*, which was well flowered and about three inches in diameter. He won a first prize for *Dionysia michauxii* in flower, in addition, this being entered as a new and rare plant.

In Section C, Mr. R. A. Hodgeson won the class for a new or rare plant with *Raoulia rubra*, a less commonly grown vegetable sheep from New Zealand.

A stand was arranged by the University of Newcastle to commemorate the late Mr. R. B. Cooke, who bequeathed his house and garden, Kilbryde at Corbridge, to the University. It was fitting that the new award, the R. B. Cooke Plate, was introduced by the local Group on the same day.

An attractive trade stand was provided by Mr. and Mrs. A. R. Huntley, who are local Group members, and who recently opened an alpine plant nursery in a beautiful scenic setting just West of Alston in Cumberland, their firm being named Hartside Nursery Garden.

A large sales table was provided and manned by local members, who together ensured that it was a well run and successful Show.

G. I. MERELIE

PERTH

DESPITE the increased cost of petrol and the fact that some of the usual competitors were unable to be present, it was encouraging to find that the number of entries considerably exceeded last year's high level. Sadly missed was Major-General D. M. Murray-Lyon, whose kilted erect figure had been a familiar sight to supporters of the Perth Show ever since its inception. We were glad, however, to be able to include some of the late General's plants on the Show benches as a reminder of a well-loved and much respected member.

The judges—the Club President Mr. A. Evans, Mr. J. R. Aitken, Perth, and Mr. J. S. Annand, Branklyn, Perth—could have had little difficulty this year in deciding where to award the Forrest Medal for

Fig. 70—*Dionysia. aretioides* 'Paul Furse' Photo—H. Esslemont

Fig. 71—*Iris winogradowii* Photo—H. Esslemont

the best plant in the Show: Mr. H. Esslemont's *Androsace imbricata* was a superb example of a high alpine plant grown to perfection. This competitor had few entries, but these were choice and included the densely hairy *Draba mollissima*, which gained a Certificate of Merit, and a collected plant of *Arum creticum*.

The winner of the L. C. Middleton Challenge Trophy for most points in the Open Class gained from First Prizes was Mr. J. B. Duff, who was also awarded the Alexander Caird Trophy in Class 1 for six rock plants, distinct, and his entry was *Kalmiopsis leachiana* (Certificate of Merit), *Pleione limprichtii*, *Daphne petraea grandiflora*, *Cassiope* 'Randle Cooke', *Lewisia tweedyi* and *Lewisia heckneri*, large flowered variety. The second prize in the six pan class went to Mr. and Mrs. H. Taylor for an interesting and well-balanced entry of *Lewisia tweedyi*, *Cotula atrata lutea*, *Androsace imbricata*, *Rupicapnos africana*, *Raoulia hectori* x *Leucogenes grandiceps* and *Anchusa caespitosa*.

Class 2, for three rock plants of different genera, for which the Dundas Quaich is awarded, was won by Mr. J. Sutherland, Inverness, with *Primula petiolaris* (or should it be *gracilipes*?), *Lewisia tweedyi* and *Kalmiopsis leachiana*.

Among the many prize-winning plants staged by Mrs. E. Ivey, Dalry, were *Androsace cylindrica* x *hirtella*, *Rhodohypoxis* 'Garnet' (a particularly large red form), *Corydalis cashmeriana* and, wonder of wonders, a flowering plant of *Ranunculus glacialis*, which is extremely difficult to grow far less flower, in cultivation.

Miss G. L. Blackwood, Scone, once again dominated the Gentian classes with large pans of *G. acaulis* and *G. verna angulosa*, giving a dazzling display of blue. A sizeable pan of the rare and more difficult *G. pumila* from the late General Murray-Lyon's collection appeared in this class. The entry from Mr. J. D. Youngson included two plants of the Boraginaceae family, the delightful Forget-me-not flowered *Omphalodes luciliae* and *Lithospermum oleifolium*, the latter being awarded a Certificate of Merit. There was much interest shown in Mrs. D. M. Stead's *Calceolaria pinnifolia* and also in her good specimens of *Primula forrestii*, *Anchusa caespitosa* and *Cassiope selaginoides*.

A member of the Glasgow Group who is obviously building up a good collection is Mr. M. G. Adair and among the plants he brought to Perth were *Salix boydii*, *Celmisia sessiliflora* 'Mt. Potts' form, the Mossy Scabweed *Scleranthus uniflorus* from New Zealand, and *Rhododendron microleucum*.

A Trough, skilfully constructed by Mrs. M. Taylor and planted with living specimens of small alpines, won the prize for a container of various rock plants.

We were delighted that the winner of the Bronze Medal for the most points in Section II was Mrs. M. Blair, who is an energetic member of the Perthshire Group Committee; we wish her further successes in Section I. A plant not often seen at Shows, but which was much admired in Section II, was Dr. D. M. Stead's well-flowered and unusually compact *Lathyrus vernus*.

Mr. J. R. Aitken of Orchardbank Nursery, Perth, as usual decorated the platform of the hall with his Trade Stand which was much appreciated. Additional attractions were the Exhibition of Paintings of Alpine Plants by Mr. Lawrence Greenwood, whose work has given so much pleasure to supporters of the Show in the past few years, and two arrangements of the Ikebana form of Japanese floral art by Mrs. Renton, Kinross.

The display of Show Posters designed and painted by a class of the children of Kinnoull School (the venue of the Show) has become a popular feature of the Perth Show, as has their exhibition of container gardens and it is no coincidence that their teacher is our Show Secretary.

Our thanks are due to all exhibitors who supported the Show, many of them having had to travel considerable distances, and to the band of willing helpers, particularly the ladies who provided and served the refreshing tea and home baking, and last, but not by any means least, to the Secretary, Miss Rhoda Fothergill, for carrying the burden of organisation and for her extra efforts in so successfully encouraging the children in their artistic displays.

J. B. DUFF

GLASGOW

ATTENDANCE figures at the Glasgow Show on 10th May were good in spite of the counter-attractions of the 'Glasgow 800' celebrations and the Rangers-Celtic Cup-tie. The well-filled benches, with entries from a wider area than usual, indicated the popular appeal to exhibitors of a one-day Show.

The chief prize-winner was Mrs. Betty Ivey, Dalry, whose excellently grown plants earned for her the Dr. Wm. Buchanan Memorial Rose Bowl, with a six-pan entry comprising *Trillium erectum*, *Primula* ? *sieboldii*, *Primula goebelli*, *Verbascum* 'Waithman dwarf', *Lewisia* hybrid,

Corydalis cashmeriana, and the Henry Archibald Challenge Rose Bowl for three pans, *Primula* 'Apple Blossom', *Lewisia* 'Geo. Henley', *Rhododendron* 'Pipit'. Obtaining the greatest number of first prizes in Section I, Mrs. Ivey was awarded the Crawford Silver Challenge Cup. Among prize-winning plants contributing to this award were *Saxifraga diapensioides lutea*, *Primula forrestii*, *Rhodohypoxis* 'Garnet', *Cassiope selaginoides* L. & S. form.

The three-pan class for plants rare, new or difficult in cultivation is always a focus of attention; fellow exhibitors and other Club members appreciate the skill required to produce such plants as *Jankaea heldreichii*, *Calceolaria darwinii* x *fothergillii*, *Dicentra* 'Rokujo hybrid', for which Mrs. S. Maule, Balerno, was awarded the Wm. C. Buchanan Challenge Cup. Mrs. Maule gained a first prize with *Eritrichium howardii* in the one-pan class for plants in this same category.

Drs. J. & C. Gosden, Eskbank, retained the Edward Darling Memorial Salver for three rhododendrons suitable for the rock garden with *Rhododendron* 'Chikor', *Rhododendron* 'Curlew' and *Rhododendron saluenense*. Other prize-winning dwarf rhododendrons shown by these exhibitors were *R. campylogynum* and *R. impeditum*.

The space allocated for the Ericaceae was strained to the limit by the many fine examples exhibited. Outstanding even in this select company was Mr. J. D. Crosland's *Cassiope wardii*, for which he was awarded the Forrest Medal for the best plant in the Show. Mr. Crosland also gained Certificates of Merit for his *Androsace imbricata*, *Paraquilegia anemonoides* forma *pallida*, *Pleione limprichtii*.

The James A. Wilson Trophy and Bronze Medal were won by Mr. and Mrs. J. Jolly, Dalmuir, who gained the most points in Section II. Their plants included *Ramonda myconi*, *Pinguicula vulgaris*, *Antennaria dioica rosea*, *Gentiana acaulis*, *Anemone magellanica*.

A close challenger to Mrs. Ivey for the Crawford Cup was Mr. Malcolm Adair, Glasgow, whose *Ourisia macrocarpa caespitosa gracilis*, *Primula forrestii*, well grown conifers and other fine plants gained for him many first prizes.

Included in the wide range of plants exhibited by Mr. Norman Brown, Dumfries, was a particularly fine specimen of *Daphne collina*. In the Primula section Mr. Brown's *P.aureata*, *P.gracilipes* and *P.rosea* 'Delight' were prize-winners, as were his *Chamaecyparis obtusa nana intermedia* and *Chamaecyparis pisifera nana* in the Dwarf Conifer

section. Mr. Brown's versatility as a grower was further evident from his success in the classes for Polyanthus and Show Auriculas.

The name of Mrs. E. MacLean, Bearsden, is always prominent in the classes for bulbous plants and her *Iris* 'Green Spot', *Tulipa* 'Bronze Charm' and *Tulipa linifolia* won well-merited 'firsts'.

As the Show Secretaries toured the benches (and in a one-day Show it was a lightning tour rather than a comprehensive study) outstanding plants caught their attention—*Omphalogramma vinciflorum*, shown by Dr. D. M. Stead, Thorntonhall; Mrs. Joan Stead's *Corydalis cashmeriana*; *Gentiana verna angulosa* grown from seed by Mr. W. L. Morton, Bearsden, and his *Rhododendron* 'Princess Anne'; *Dactylorchis elata* and *Cypripedium acaule* exhibited by Mr. C. Simpson, Bearsden; *Androsace imbricata* grown from seed by Dr. and Mrs. J. E. G. Good, Bonnyrigg; and a cushion of *Raoulia mammillaris* shown by Mr. H. Esslemont, Aberdeen.

The effect of adverse weather conditions earlier in the year caused conspicuous absences from the Rhododendron section. The entries from Mr. and Mrs. Neil Rutherford, Rosneath, and Mr. A. P. Cumming, Blairmore, together with several smaller entries, did, however, produce a colourful display in the rear gallery. Mr. and Mrs. Rutherford won the Urie Trophy and the Rhododendron Challenge Trophy by gaining the most points in the Section, as well as the Sir John Stirling Maxwell Rhododendron Trophy for the best individual truss, while Mr. A. P. Cumming was awarded the prize for the best hybrid.

The interest shown in the stamps exhibited by Miss Margaret MacIntyre in 1974 led to the inclusion in this year's Show of an enlarged exhibition of flowers on stamps by Miss MacIntyre, Mrs. Clark, Mr. John Maule and Master Stuart Small. The exhibits attracted considerable attention.

Messrs. J. & R. Ponton, Kirknewton, provided a well filled stand of plants for sale, of which exhibitors and visitors took full advantage. For their excellent display Messrs. Ponton were awarded a Gold Medal.

The Secretaries are very much aware that the success of the Show was due to the participation of exhibitors, helpers, judges and, last but not least, the members of the West of Scotland Group who manned the tearoom; to all they acknowledge their indebtedness.

M. G. HOLGATE
M. THOMSON

DUNFERMLINE

THE SHOW was held in The Music Pavilion, Pittencrieff Park, on May 24th. A spell of dry sunny weather had helped to make the Show one of the most successful held over the last few years. Entries in the Open Section were almost double those of 1974, while the standard of the exhibits was excellent throughout the Show.

There were eight entries for Class 1 (3 Pans). First prize, The W. B. Robertson Challenge Cup, was won by Mr. J. D. Crosland with *Pleione pogonioides*, *Anchusa caespitosa* and *Omphalogramma minus*. Mr. H. Esslemont came second with *Rhododendron yakusimanan*, *Erinacea pungens* and *Iris ancilla*, for which he was awarded a Certificate of Merit.

In the new, rare, or difficult class, Mr. J. D. Crosland won first prize with *Chiloglottis gunnii*, the common bird orchid of the State of Victoria, Australia. This intriguing little woodlander was awarded the George Forrest Medal for the most meritorious plant in the Show. Mr. Crosland had taken great pains to exhibit the orchid against a background reminiscent of its natural habitat.

Second prize in this class went to Mrs. S. Maule with the aristocratic *Jankaea heldreichii*. Mrs. J. Stead exhibited the very rare *Notothlaspi rosulatum*, which came third.

There were some good silver-grey plants. *Celmisia sessiliflora* 'Mt. Potts' form took first for Mr. M. G. Adair, Glasgow. Mrs. J. Stead was second with *Helichrysum plumeum*, and Mrs. E. Ivey was third with *Helichrysum coralloides*.

Two pans from seed was an interesting class in which Mrs. S. Maule was first with *Raoulia eximea* and *Haastii pulvinaris*. Dr. and Mrs. J. E. G. Good were second with *Lewisia cotyledon* and *Primula suffrutescens*. Third was Dr. D. M. Stead with *Geranium farreri* and *Incarvillea* dwarf form.

Mrs. E. Ivey had some fine plants on show. A five-year-old plant of *Androsace* x *cylindrica* grown from seed took first in Class 10, *Phyteuma comosum* was another winner, while in Class 25 *Rhodohypoxis* 'Pictus' and *Rhodohypoxis* 'Garnet' took pride of place. Mrs. Ivey was also awarded a Certificate of Merit for a well-flowered *Daphne jasminea* in the dwarf shrub class.

Mrs. B. B. Cormack won the 2 pans Sedum class with *Sedum heterodontum* and *Sedum fastigiatum*, both in full bloom. A flowering *Sedum pilosum* was a winner for Dr. and Mrs. J. E. G. Good in the one pan Sedum class.

Of nine colourful entries in the Lewisia class, *Lewisia rediviva* led the field for Mrs. J. Stead.

Mrs. J. Stead also won the Ranunculaceae Class with a well-grown pan of *Ranunculus gramineus*. Mrs. S. Maule was second in this class with *Ranunculus asiaticus*, a plant of great beauty.

Two miniature Rhododendrons stood out in the Ericaceae Class. *Rhododendron trichostomum* won a first for Mrs. J. Stead, while *Rhododendron sargentianum* took second for Drs. C. and J. Gosden.

There was only one entry in Class 27 for one pan Orchidaceae, a lovely example of *Orchis purpurea* which Mr. Crosland had collected in Sardinia.

Dwarf Conifers were mainly of the younger generation. Dr. D. M. Stead took first in the two pan class with *Abies hudsonii* and *Cryptomeria japonica spiralis*.

In Class 31 there was a variety of excellent plants. First was *Rubicarnos africana* for Mr. W. L. Morton; second came *Phlox adsurgens* for Mr. M. G. Adair, and third was *Silene ingramii* for Dr. and Mrs. J. E. G. Good.

Mr. M. G. Adair won The Carnegie Dunfermline Trust Trophy for most points in Section I. Mr. Adair was also awarded a Certificate of Merit for a well-flowered *Celmisia bellidioides*.

The Bronze Medal for most points in Section II was won by Dr. M. O'Gorman of Stirling with a good selection of well-grown plants.

In Section IV, restricted to Fife members, there was a variety of Sempervivums and Sedums on show. Saxifrages were in full bloom this year too.

In Class 51 for 3 pans, *Dodecatheon pulchellum* 'Redwings', *Alyssum spinosum roseum* and *Erica mediterranea* 'Silberschmelze' won first prize. *Bolax gummifera* took first for Miss B. Milburn in the cushion plant class. Miss Milburn also won both the Sedum classes. Three pans Sempervivum was won by *Sempervivum arachnoideum laggerii*, *Sempervivum fauconettii* and *Sempervivum schlehanii*.

A colourful array of Penstemons was displayed in the 1 pan Scrophulariaceae class which was won by Mr. J. Muir.

The Institute of Quarrying Quaich was won by Mrs. J. L. King, Cowstrandburn, for most points in the Section.

The Committee and helpers would like to express their gratitude to all the exhibitors, many of whom travelled long distances, for staging such a beautiful array of first class plants.

MR. & MRS. J. E. CAMPION

ABERDEEN

IN SPITE of the late season Show date the weather during the week preceding, as well as on the day, was cold, wet and windy, and in these circumstances it was gratifying to open the doors on the first of our local one day Shows, to a first class display of plants suitable, by definition, for the rock garden, the alpine house or frame.

Although the number of competitors was one less, the total number of class entries was actually one more than the previous year's two days Show. The essence was colour and contrast in the plant varieties displayed; there was animation and an obvious pleasure on the part of members and visitors throughout the day, and five new members were recruited to the Group.

The Walker of Portlethen Trophy, presented by the late Dr. Henry Tod, F.R.S.E., awarded annually to the competitor gaining most points in Section I, this year passed into the hands of Mr. A. D. McKelvie, whose plants have made a notable contribution to the show benches in recent years. His many successes included seven first prizes and, noteworthy among these were *Andromeda polifolia*, *Erica* 'Silberschmelze', an interesting well-flowered *Pentstemon* hybrid suggested to be a *rupicola* x *newberryi*, a striking pink-flowered *Lewisia cotyledon* hybrid, so covered in blooms the judges awarded a Certificate of Merit, and a well-grown *Meconopsis quintuplinervia*—judged the best of six plants in its class.

There was no competition in Class 1—6 Pans Rock Plants, distinct, the only entrant being Mr. J. D. Crosland. The entry gained the Aberdeen Bronze Medal, including also the George Forrest Memorial Medal awarded to the most meritorious plant at the Show—*Daphne petraea grandiflora*—and a Certificate of Merit for *Anchusa caespitosa*, a plant collected in the White Mountains of Crete in 1972. The remaining plants of the entry were *Androsace villosa*, *Corydalis cashmeriana*, *Pinguicula grandiflora* and *Omphalogramma minus*. Of interest to the plantsman, the last three plants were all grown in the open, without any form of cover, at any season.

Class 2—3 plants of different genera, was keenly contested by three competitors. Mr. Esslemont's entry took first place with *Rhododendron yakusimanum*, surely one of the finest of recent new introductions; *Iris ancilla*—a beautifully marked *regelio-cyclus* hybrid—Certificate of Merit, and a good form of *Campanula aucheri*, collected by the late Major Sherriff of Ascreavie, Angus. A close second, Mr. A. D. McKelvie's *Lewisia cotyledon* hybrid, *Saxifraga hypnoides* and *Euphorbia*

polychroma.

In third place, *Verbascum* 'Letitia', *Stylidium graminifolium* and *Talinum spinescens*—three fine plants shown by Mr. George Simpson. First prizes were also gained by Mr. Sinclair's *Saxifraga cochlearis* in Class 37, and a well-grown Sempervivum species in Class 44. Champion of the Scottish Native Plants in the Open Section I was *Salix reticulata*, shown by Dr. D. G. Hardy.

Classes from seed excite special interest and a total of nine entries were recorded in the Two and Single Pan Classes 4 and 5. Mr. Crosland took first in the former with a white-flowered form of *Paraquilegia anemonoides*, seed collected by the Wye College Expedition to Nepal and sown in 1971, and *Primula reidii williamsii album*, sown in 1973. Second and third in this Class were Mr. Esslemont's *Raoulia eximea* and *Iris timofijewii*—a Pogon iris grown from Russian seed, and Dr. Hardy's *Lewisia cotyledon* hybrid with *Primula reidii williamsii*. The Single Pan Class was dominated by Mr. Esslemont's *Saxifraga florulenta* —a symmetrical rosette several inches across, seed sown some ten years ago.

In the Class New, Rare or Difficult in Cultivation, Mr. Crosland's pan of the Common Bird Orchid of Victoria, Australia—*Chiloglottis gunnii*—was placed first and awarded a Certificate of Merit. The Class also included a rare Andean endemic, *Ourisia microphylla*, exhibited by Mrs. B. B. Cormack, Edinburgh.

Silver-Grey Foliage, Cushion Plants and Orchidaceae excluding Pleione, were won by Mr. Esslemont's *Raoulia mammillaris*, *Draba mollissima* and *Cypripedium acaule* respectively.

A fine form of *Campanula allionii* submitted by Dr. J. E. G. Good of Bonnyrigg, Midlothian, was seconded by another good *Campanula betulaefolia* grown by Mr. Sinclair.

The outstanding plant in the Class for Compositae, filling a twelve-inch pan, was *Celmisia glandulosa*, presented by Mr. J. N. Aitken, and, for the third year running, Mrs. Helen J. Blair's Dwarf Conifers won in the Two Pans Class. Miss K. O. Kelly of Banchory brought a fine pot of *Tulipa batalinii* and, in the Class for Primulaceae, an extremely vigorous and well-flowered Dodecatheon species—reminiscent of 'Red-wings'.

The Class for a single Asiatic Primula was supported by five entries, adjudicated as follows: first, a selected form of *Primula reidii*, by Dr. Good, *Primula ioessa* by Mr. Crosland, and *Primula muscarioides* by Mrs. Cormack.

Only a single entry in the Class for Androsace, shown by Co-Show Secretary, Mrs. Sylvia Simpson, a small but well-flowered *Androsace imbricata.* Dr. Good's *Sedum pilosum,* in full flower, was a clear winner.

Mrs. Cormack's *Sempervivum arenaria* and *S. arachnoideum glabrescens album* took the lead and added interest to the Class.

Section II of the Schedule registered a sharp fall in entries which, it is hoped, will prove no more than a passing phase, but there was evidence of good cultivation and presentation.

The Club Bronze Medal for the highest number of points in the Section was awarded to Miss Alison Hardy for a series of first and second prize-winning plants, notable among which were: *Primula polyneura, Antennaria dioica, Lewisia cotyledon* hybrid, *Potentilla megalantha* and *Sedum rosea.* Mrs. D. C. Lintott joined first prize-winners with the Scottish Native, *Antennaria dioica,* and a neat *Hebe pagei.*

Miss Jeanie Simpson created an effective miniature collection of growing plants in a nine-inch pan, and Mrs. Simpson graced the tables with a posy of cut alpine flowers and a vase of cut flowers from flowering shrubs.

In the Junior Section, Two Pan and Single Pan Classes, Miss Joan Elder set the standard, claiming firsts for her Lewisias and *Oxalis adenophylla,* followed by Miss Alison Hardy showing *Lewisia cotyledon, Erica vulgaris* 'Multicolor' and *Sedum rosea.*

Once again we enjoyed supporting displays by Aberdeen University Cruickshank Botanic Garden and, for the second year, the City of Aberdeen Department of Leisure and Recreation staged a colourful built-up rock garden. At both of these stands there was much noting of plant names; many enquiries arose. We are indebted to Mr. Sutherland of the University Garden, and to the Department of Leisure, for fulfilling such an excellent educational role.

The display was further enhanced by Messrs. Jack Drake whose large stand included primulas in variety, meconopses, saxifrages and a big show of Lewisias including their famous 'Sunset Strain'. Artistry was the keynote of the display by Mrs. McMurtrie of Balbithan House, Aberdeenshire, who cleverly simulated stone troughs using a series of polystyrene boxes, staging these against a background of her own beautiful flower paintings.

Entirely new to Aberdeen Show was a fine exhibition by Mr. John Maule of Balerno, Midlothian, of Postage Stamps depicting the national flowers of many countries—a display which attracted much interest

and compliment, and a well-deserved Certificate of Merit.

The Committee express their warm thanks to the Judges: Messrs. A. Evans of Edinburgh, R. J. Mitchell of St. Andrews, and F. G. Sutherland of Aberdeen for their deliberations, and to all who supported the Show.

J. D. CROSLAND

Cyclamen mirabile Hild

by R. J. MITCHELL

THERE appears to be some doubt about the authenticity of the name of *Cyclamen mirabile* (fig. 72). Professor F. Hildebrand described this species in 1906 in Beih. Bot. Centralbl. 19(2): 370 from a single plant collected in Smyrna. The plant died and the herbarium specimen was destroyed during the war.

In the meantime Schwarz (1955) relegated it as a mutation of *C. libanoticum.* However, collection of tubers of *C. mirabile,* identical to the plant described by Hildebrand, by Davis in 1956 and 1965, and by Albury, Cheese, Mitchell and Watson in 1966-7, subsequent to the monograph by Schwarz, show it to be closely related to *C. cilicium.* Ietswaart (1969) suggests that it should be considered as a sub-species of *C. cilicium.*

This plant is a rare species known at present from only three localities in Turkey. It was therefore disturbing to learn that 50,000 tubers imported in 1973 as *C. neapolitanum* turned out to be *C. mirabile.*

Peter Davis found *Cyclamen mirabile* in shady conditions on rocky granite north-facing slopes, while Albury *et al* found it growing on limestone hillsides. In cultivation this species requires a well-drained humus-rich soil and, being slightly tender, is best grown in an alpine house or cold frame in semi-shade conditions.

The tuber is corky and fissured. Roots arise at the lower half of the tuber. The leaves are circular or kidney-shaped and are toothed. The petiole is reddish, as is the lower leaf surface. Young leaves have a characteristic carmine pink zonal coloration and not silvery-white as in other species. Mature leaves are similar to *C. cilicium.* This is an autumn flowering species, the flowers appearing before the leaves. The petals are pale pink with a small purple blotch.

1. Anthony Huxley, 1974. J.R.H.S. XCIX, pp. 242-49. The Ethics of Plant Collecting.
2. J. H. Ietswaart, 1969. Bull. A.G.S. 37: 362-66. Some comments on two *Cyclamen*.
3. R. D. Meikle, 1970-2. Curtis Bot. Mag. N.S.t. 579.
4. Lewis Palmer, 1967. J.R.H.S. XCII, p. 89. *Cyclamen mirabile* Hild.
5. D. E. Saunders, 1973. *Cyclamen*. A.G.S. Publication.
6. O. Schwarz, 1955. Feddes Report 58: 234-283. Systematische Monographie der Gattung *Cyclamen* 1.

Plant Notes

IRIS WINOGRADOWII

THIS FINE dwarf reticulate iris, although still rare, is now becoming more readily available (fig. 71).

It is a native of the Caucasus where it grows in alpine meadows and is of course completely hardy.

The flowers are lemon yellow with an orange crest and there are a few darker spots on the falls. It flowers in February or early March.

It is a little difficult to know why *Iris winogradowii* remains such a scarce and expensive bulb, but perhaps I can suggest a reason.

About twelve years ago I acquired three bulbs of this Iris for quite a modest sum. I grew them in a pan in the alpine house for a few years where they flowered and increased slowly.

Pressure of space in the alpine house eventually decided me to plant them out of doors. I chose the edge of a slightly raised rose border in full sun.

The irises quickly settled in to their new quarters and this year had increased to a hundred flowering plants and as many unflowered ones.

The only attention they receive is a sprinkling of bone meal in January and division periodically when they become crowded.

The reason for their greater success out of doors is due, I believe, to their very short dormant period.

Out of doors their leaves do not die back completely until the end of June and if one lifts corms in the beginning of August one finds that new root growth has already commenced.

There are few insects around in February and hand pollination can add a bonus of a few seed pods in Autumn. Sown fresh they germinate readily the following Spring and provide a welcome gift for gardening friends.

This attractive Iris promises to be a good doer and can be recommended.

Aberdeen H. E.

LEUCOJUM VERNUM SSP. CARPATICUM 'Roxie Gevjan'

Leucojum vernum is a commonly known plant, grown in gardens for centuries. This species is divided into two races on the edge of the Alps and Carpathians. To the west it is *L. vernum* ssp. *vernum* with smaller white green-spotted flowers. This plant has been usually grown in the British Isles. To the east *L. vernum* ssp. *carpaticum* occurs and it is native in Sudets Mts., Carpathian Mts. and Hungary. This one is different in having shorter, broader leaves and larger flowers with yellow spots under the edges of petals. This plant is commonly grown in Czechoslovak gardens. Millions of wild plants are in full bloom each spring on the meadows around our rockery. I had found here, years ago, a plant with shorter, semi-double flowers and considerably shorter leaves. I have named in honour of my good friend 'Roxie Gevjan' (fig. 73). Our plant has sixteen or twenty petals, but stamens and pistils are kept in comparison with typical wild form with six petals. It is as easy as another *L. vernum* and is in full bloom every year. Division of bulbs is very easy and so the propagation is very easy. I use peat and the soil which is provided by our mole.

Prague J. HALDA

PRIMULA EDGEWORTHII

Primula Edgeworthii is a member of the Petiolaris section. It grows in the form of a rosette about 3 inches high and up to 6 or 7 inches across. The roundish leaves are covered in white meal and are toothed round the edges.

The flowers, borne on short stems and just above the leaves, are lilac in colour and vary quite a lot in colour shade. When buying a plant it is advisable to see it in bloom if possible to ensure getting the shade you prefer.

It is not too difficult so long as it is given the treatment it likes. It stands up well to frost, but it must be protected from winter wet during its dormancy. To achieve this you can of course put a cloche over it, if you can bear that. It will do quite well in an alpine house or cold frame where it will get protection from battering rain, sleet and hail. Good light and ventilation, especially under glass, are however essential. If, like me, you object to glass on your peat beds, the

place for it is in a wall either of stone or of peat blocks. It should be planted on its side under an overhang, but remember it does not appreciate much shade, and must have a reasonable amount of sun to flower well. Dryness at the root it definitely does not like, so be sure it has plenty of good soil behind and around it to guard against that.

As regards soil, this must be moisture retaining, but well drained. It should have in it a good proportion of peat and/or leaf-mould, the exact proportion depending upon the character of your garden soil.

Propagation is not difficult and plants may be divided or rooted offsets may be removed; the best time to do this is soon after flowering, which usually takes place in February or March; in a mild winter, however, you may have flowers in January. Seed if it is sown at once as soon as it is ripe, and still green, usually germinates well. Stale seed, as you may get from seed exchanges, may be difficult to germinate, but a good freezing before sowing may help. A humusy soil mixture is what it requires. Before sowing the seed, cover the soil with a thin layer of fine gravel of perhaps about one eighth of an inch diameter, then sow the seed and dust over it with a very thin layer of very fine dusty compost, then water it in lightly with a fine spray. By this means you should avoid getting the seeds washed into groups, which makes pricking out difficult. It also helps to prevent drying out. Until the seedlings come through keep the pan under light shade.

Moving or re-potting is best done as soon as possible after flowering.

Nomenclature of this primula has been rather confused as for many years it was known as *Primula winteri*, and during another period the primula now known as *Edgeworthii* was known as *sessilis*, which now of course is the name of another species of Petiolaris primula.

If reading about any of these primulas in an old book or article this should be kept in mind, otherwise you may come to quite wrong conclusions.

There is an albino form of this species with flowers of a good clear white.

Pitlochry

D. M. MURRAY-LYON
28-1-75

Angus Group Seed Exchange

by JOYCE HALLEY

As SEED is now coming in from the Southern Hemisphere it is time to remind you that seed must reach me by the 31st October or, in the case of late-ripening seed, a list of the seed you mean to send must reach me by that date.

I promised to list names of plants whose seeds are not requested. The larger forest trees, omitted from last season's list and mentioned in the April *Journal*, were immediately requested from one or two members specialising in trees; obviously we can't win. However, there are one or two species not worth listing, as shown by the lack of demand for two years: Hieracium, large Lupins, Ribes and Rubus.

On the other hand, we did not have enough seed of Aretian Androsaces, Calceolarias, Cyclamen, Narcissus and Pleiones, particularly the better colour forms of the last, and the two members who send in bulbils so regularly could do with a little help. Even two or three seeds of those plants in great demand can make somebody happy.

All donors and overseas members will receive a copy of the seed list. Home members who wish a seed list and are not donors should send a stamped addressed envelope—8½ ins. × 5½ ins.—or a stamped addressed label, if a suitable envelope is not available, to:—

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

Applications for seed must be on the form provided in the seed list, and remember that priority is given to those who contribute seed, and overseas members come first, both in donors and non-donors sections.

The gardens have been lovely this spring, so we hope that the weather will continue to be kind and give us a bountiful seed harvest.

PREPARING SEED FOR DISTRIBUTION

We have been asked several times to give some assistance to those who find cleaning seed difficult, and while we know of no magic method to lighten a slow laborious job, perhaps our ways may help. Our first expedient is sieves. We use three: the first has about 12 holes to the inch, the second about 20, and the third is a tea or coffee strainer.

One or other should hold back the rubbish and let the seed through, or hold the seed and let the sand through.

Most of the other methods make use of the fact that seed is heavier than chaff and blowing gently gets rid of the rubbish. A gentle breeze outside can save your breath, but too windy and you will be saved the trouble of sending the seed in. Remember to have the carpet sweeper handy if you do it inside.

A lot of seed is round and will roll off a sheet of stiff paper if shaken gently.

A cheap plastic pen rubbed on your jacket and waved over liliaceae will remove the unfertile seed from the fertile, provided you don't put it too near.

One exception to all these methods, that I know of, is *Phyteuma comosum*; you crush the chaff and sow the lot—do not try to clean it.

Finally, enjoy with me the few lines of doggerel sent in, with her seed, by Mrs. Harbord.

I sieved it once,
I sieved it twice,
I sieved it three times o'er.
I blew and blew and then how strange,
There's nothing left for Seed Exchange.

MISNOMERS

I regret I have not had time to do much with some members' notes about plants being perpetuated under the wrong name, but will try and tackle one close to my heart and which needs least research on my part.

In my alpine house is a tray of beautiful flowering Lewisias. The label says *L. brachycalyx* and is the result of my fifth sowing of brachycalyx seed, therefore the tenth year of effort as they take two years to flower, and again I have raised a boxful of what I take to be *L. nevadensis*. This Lewisia is a very good plant, does very well in the garden, seems to be long-lived, and I would not like to be without it, but it is not the plant I am looking for. Let me hasten to add that the seed I have used over the years has come from three seed lists, the error is widespread and not the prerogative of Scotland.

In strictly non-botanical terms, I expect *L. brachycalyx* to have leaves half an inch wide at the widest part, flower stems very short, nearly sessile, which makes the bracts look like part of the calyx, and the flower does not seem to open very widely.

In contrast the leaves of *L. nevadensis* are a quarter inch wide at their widest part, flower stems up to one inch between bract and calyx, and the flowers open widely. As the petals are not all the same length, the flower has a slightly oval shape.

As a result of my remarks in the April *Journal*, a note from a member about fifteen miles away has resulted in a present of two or three seedling *L. brachycalyx*, the real one! And I haven't the slightest doubt that my benign benefactor has had *L. brachycalyx* for ten years and more!

Joint Rock Garden Plant Committee

GLASGOW—10th MAY 1975

AWARDS TO PLANTS

AWARD OF MERIT

To *Ranunculus amplexicaulis* as a flowering plant for the rock garden. Exhibited by Mrs. J. Stead, Esk Hause, Bishop's Park, Thorntonhall, Glasgow.

CERTIFICATE OF PRELIMINARY COMMENDATION

To *Sarcocapnos crassifolia* as a flowering plant for the alpine house. Exhibited by H. Esslemont, Esq., 9 Forest Road, Aberdeen.

To *Calceolaria pinifolia* as a flowering plant for the alpine house. Subject to verification of the name. Exhibited by Mrs. J. Stead, Esk Hause, Bishop's Park, Thorntonhall, Glasgow.

AWARDS FOR EXHIBITS

CERTIFICATE OF CULTURAL COMMENDATION

To Mrs. J. Stead, Esk Hause, Bishop's Park, Thorntonhall, Glasgow, for a flowering specimen of *Corydalis cashmeriana.*

To J. D. Crosland, Esq., Treetops, Torphins, Aberdeenshire, for *Paraquilegia anemonoides* forma *pallida.*

Fig. 72—*Cyclamen mirabile* Photo—H. Esslemont

Fig. 73—*Leucojum vernum* ssp. *carpaticum* 'Roxie Gevjan' Photo—Josef Halda

INDEX TO VOLUMES XII, XIII AND XIV

Abies grandis XIII 93, 130
— menziesii XIII 94
— sachalinensis XIII 117, 118;
Acaena microphylla XIV 218
Acantholimon acerosum XII 224
— diapensioides XIII 116
— lycaonicum XII 224
Acer macrophyllum XIII 93
— mono XIII 118
— rubrum XIV 144, 154
— saccharum XIV 144, 154
Achillea millefolium XIV 151
Aciphylla aurea XIII 47, 48
— colensoi XIII 47
— congesta XIV 225
— crenulata XIV 223
— dobsonii XIII 47
— ferox XIII 47
— glaucescens XIV 228
— hectori XIV 228
— horridula XIV 228
— munroi XIII 47; XIV 216
— scott-thomsonii XIV 228
— similis XIV 219, 228
— simplex XIV 218
Acomastylis calthaefolia XIII 122
— nipponicum XIII 122
Aconitum kurilense XII 254
— lycoctonum XII, 173
— orochryseum XIII 289
— spicatum XIII 289
Actinidia kolomikta XIII 118
Adenophora kurilensis XII, 256;
— marsupifolia XIV 160
— stenanthina XIV 160
Adenostyles leucophylla XII 172
Adiantum capillus-veneris XIV 271
— pedatum XIV 271
Ajuga pyramidalis XII 237
— reptans XII 236-7
Allium altaicum XIV 159
— amabile XIII 212, 243
— beesianum XIII 189, 211, 212, 238, 243
— forrestii XIII 212, 238, 243
— lineare XIV 160
— x mairei XIII 211, 212
— narcissiflorum XIII 243
— regelii XIII 116
— rhynchogynum XIII 243
— rosenbachianum XIII 110
— tricoccum XII 85
— yunnanense XIII 243
Aloe ciliaris XII 24
— marlottii XII 23
— plicatalis XII 23
Alstroemeria ligtu XIV 41
Alyssum biovulatum XIV 161
— cephalotes XII 225
— comtemptum XII 223
— lenense XIV 161-2
— mouradicum XII 223
— sibiricum XIV 161-2
— tortuosum XIV 161
Amaryllis XII 111-12
Amethystea caerulea XII 178
Amygdalus pedunculata XII 175-6, XIV 160
Anacamptis pyramidalis XII 271
Anacyclus formosus XII 225
Anagallidium tetrapetalum XII 255
Anagallis arvensis XIV 126
— monelli XIV 126
Anandria bellidiastrum XIV 66
Anaphalis margaritacea XII 50, 90
Anarthrophyllum desideratum XIII 300
Anchusa caespitosa XIII 45, 143, 279
Andromeda caerulea XII 141
— polifolia XIV 234
Androsace alpina XII 7, 9, 11
— argentea XII 9
— brigantiaca XIV 292
— carnea XIV 291-2
— chamaejasme XII 172; XIV 291
— ciliata XIV 183, fig. 45
— delavayi XII 260
— eximea XIV 292
— filiformis XII 177
— geraniifolia XIII 211, 237
— globifera XIII 289
— hedraeantha XIV 292
— helvetica XII 172, fig. 51, 173; XIII 10, 280; XIV 23-4, 182
— hookeriana XIII 286
— imbricata XII 9; XIII 10; XIV 285, 287, 288, 290-1
— incana XII 177
— lactea XIV 293
— laggeri XIV 292-3
— lehmannii XIII, 289
— mathildae XIV 294
— obtusifolia XII 9; XIV 291
— pyrenaica XIV 225
— sarmentosa XIII 211
— spinulifera XIII 211, 237, 254
— triflora XIII 42
— villosa XII 29, 30, 177; XIII 114
— vitaliana XIV 292
Anemone alpina XII 317; XIII 7
— — sulphurea XIV 224-5
— blanda XII 224
— coronaria XIV 23
— demissa XIII 40, 283
— fulgens multipetala XIV 209
— japonicum XIV 39
— narcissiflora XII 12, 174, 309; XIII 40, 71, 254
— nemorosum XIV 48
— patens XII 84
— polyanthes XIII 283
— quinquefolia XII 84
— rivularis XIII 283
— rupestris XIII 288
— rupicola XII 377-8; XIII 254
— villosissima XIII 71
Anemonella thalictroides XII 59, 84; XIV 145
Anisotome carnosula XIV 226
— imbricata XIV 223
Anthericum liliago XIII 51
Anthyllis montana rubra XIII 51
Aphyllanthes monspeliensis XII 273
Aquilegia alpina XII 28, 174; XIV 291
— flabellata XII 255
— jonesii XIII 300; XIV 26
— montana XIV 296
— pyrenaica XIII 53
— schockleyi XII 166
Arabis aubrietioides XII 225
— caucasica XII 223
— cyprius XIV 23
— soyerii XII 166
Aralia elata XIII 69
Arbutus XII 229
— menziesii XIII 93
Arcterica nana XIII 337
Arctostaphylos uva-ursi XII 49
Arctous alpina XII 257
Arenaria tetraquetra XIII 51
Aretia vitaliana XIV 292
Arisaema angustatum XIII 70
— atrorubens XII 84
— candidissima XIII 238
— peninsulae XIII 70
— triphyllum XIV 149, 150
Aristea africana XII 25
Armeria fasciculata XIV 126

Armeria montana XIV 295
— pungens XIV 126
Arnica alpina XII 272
— montana XII 311
— unalascensis XIII 124, fig. 32
Artemisia frigida XII 177; XIII 324
Asclepias tuberosa XII 88
Asparagus dahuricus XIV 66
— gobicus XIII 324
— officinalis XIV 66
Asperula arcadiensis XIV 187
Asphodeline rigidifolia XII 225
Asphodelus acaulis XIV 185
Asplenium adiantum—nigrum XIV 269
— fontanum XII 272
— ruta-muraria XIV 269
— septentrionale XII 60, 272
— trichomanes XIV 269
— viride XIV 269
Astelia linearis XIV 222
— nervosa XIV 219
Aster alpinus XII 176, 225, 272; XIV 286, 290, 291
— altaicus XIV 67
— biennis XIV 67, fig. 21
— consanguineus XIII 72
— douglasii XII 50
— dubius XIII 72
— farreri XII 282
— forrestii XIII 193
— himalaicus XIII 284
— hispidus XIV 67
— serpentimontanus XII 176
— tripolium XII 258
Asterothamnus centrali-asiaticus XIII 323
Astragalus alindanus XII 223
— alpinus XII 178
— angustifolius XII 223
— capilipes XIV 161
— fructicosus XIV 68
— galactites XIV 66, 68
— laguroides XII 178
— melilotodes XIV 160
— microrchis XII 223
— miniatus XII 178
— mongolicus XIII 324
— nevadensis XIII 53
— pinetorum XII 223
— propinquus XIII 324; XIV 68
— sorgerae XII 224
— tenuis XIV 161
Astrantia major XII 173
Athyrium filix-femina XIV 275
— yokoscense XIII 118
Atragene alpina XIV 296
Atraphaxis frutescens XIII 322
— lanceolata XIII 322
Aubrieta canescens XII 223
— deltoidea XII 223
Aurinia rupestris XII 2224

Ballota lanata XIII 323
Banksia menziesii XIII 93
Berberidopsis corallina XIII 35
Berberis aquifolium XII 51
— darwinii XIV 232
— nervosa XII 51
Bergenia purpurascens XIII 283
Berkleya macrocephala XIV 296
Betula albo-sinensis XIII 130
— dalecarlica XIII 130
— nana XII 149
— pendula XIII 130
— papyrifera XIII 130
— verrucosa 'Youngii' XIII 130
Biscutella laevigata XII 173; XIV 286
Blechnum penna-marina XIV 275
— spicant XIV 275
— tabulare XIV 275
Bobertia juncifolia XII 25

Briggsia aurantiaca XIII 8
Bryanthus taxifolius XII 141
Buddleia alternifolia XII 282
— fallowiana XIII 213
Bulbinella angustifolia XIV 219
— hookeri XIV 216
Bulbocodium vernum XIII 100; XIV 20
Bupleurum ranunculoides XII 258; XIII 324
— triradiatum XII 258
Buxus sempervirens XII 28

Calandrinia megarhiza XIII 295
— mexicana XIII 295
Calceolaria darwinii XIV 24, 40
Calimeria tatarica XIV 67
Calluna 'H. E. Beale' XII 49
— vulgaris XII 237
Caltha palustris XII 84
Calypso bulbosa XIV 23
Camassia esculenta XII 148
Camellia japonica XIII 193
— reticulata XIII 178
— saluensis XIII 178, 193
— x williamsii XIII 193
Campanula allioni XII 186; XIV 283
— barbata XII 10, 172, 263, 311; XIV 284, 287
— carpatica XIII 9
— cenisia XIV 289
— cochlearifolia XII 10
— compacta XII 225
— excisa XIII 276; XIV 276
— mollis XIII 50
— morettiana XIII 9; XIV 184
— piperi XIII 276
— portenschlagiana XIV 27
— pusilla XII 10, 172; XIV 283, 285
— rotundifolia XII 89; XIV 216
— rupestris var. anchusifolia XIV 23
— scheuchzeri XIV 285
— spicata XIV 283
— thyrsoides XII 311
— tommasinianus XIII 276
— turbinata XII 166
— x wockii XIII 276
— zoysii XIV 24, 27
Caragana aurantiaca XIII 325
— microphylla XIV 160
— pygmaea XIII 324, XIV 68, 160
Cardiocrinum giganteum XIII 240, 282
Carex capillaris XII 258
Carlina acanthifolia XIV 295
— acaulis XII 187
— — var. caulescens XIV 295-6
— vulgaris XIII 284
Caryopteris mongolica XIII 324
Cassiope fastigiata XIII 247, 286, fig. 69; XIV 234
— hypnoides XII 148
— lycopodioides XIII 247; XIV 234
— x macrantha XIII 248
— myosuroides XIII 247
— palpebrata XIII 247
— pectinata XIII 248
— selaginoides XIII 247, 248; XIV 36
— tetragona XIV 234
— wardii XIII 248; XIV 187
Catanache caerulea XII 273
Cautleya lutea XIII 213
Cedrus libani XII 222, 225
Celastrus scandens XIV 154
Celmisia argentea XIII 46, 50, 132
— armstrongii XIII 47; XIV 222, 223
— bellidifolia XIV 222
— bellidioides XIII 132
— coriacea XIII 45, 46, 132, 144-5, fig. 39, XIV 217, 218, 222, 224, 228-9
— densiflora XIV 229
— glandulosa XIV 222
— gracilenta XIII 132

Celmisia haastii XIV 218, 219
— hectori XIII 46, 132; XIV 218, 225, 229
— hookeri XIII 46
— incana XIV 216
— laricifolia XIII 47; XIV 218, 225
— longifolia XIII 132
— lyallii XIV 229
— monroi XIV 227
— petiolata XIV 220
— petriei XIV 225
— pro-repens XIV 217, 229
— ramulosa XIII 46; XIV 218, 225
— rigida XIII 132
— sessiliflora XIII 132; XIV 218, 219, 221, 225, 229
— spectabilis XIII 46, 132
— — var. magnifica XIV 220
— — argentea XIII 46
— verbascifolia XIV 218, 224
— vernicosa XIII 46
— viscosa XIV 218
Celsia sorgerae XII 225
Centaurea reuteriana XII 225
Cephalanthera damasonium XII 28
— longifolia XIV 297
— rubra XII 173
— sorgerae XII 224
Cerastium macranthum XII 225
Cercis canadensis XIV 144, 150
Ceterach officinarum XIV 269
Chaenorrhinum supinum XIII 52
Chamaecyparis nootkatensis XIII 130
Chamaerops humilis XIII 50
Chelone glabra XII 89
Chiloglottis gunnii XIV 25
Chimaphila maculata XII 87
Chloranthus japonicus XIII 120, fig. 33
— manshuricus XIII 120
Chorispora bungeana XIII 112
— macropoda XIII 112
Chrysanthemum alpinum XII 7, 9, fig. 1
— arvense XIV 296
— haradjanii XII 166; XIV 165, 250
— hispanicum radicans XIII 51
— isabellinum XII 224
— leucanthemum XIV 151
— praeteritum XII 223
Cichorium intybus XIV 151
Circerbita alpina XII 172
Cirsium esculentum XIV 159
— oleraceum XII 172
Cissus rhombifolia XIV 154
Cistus albidus XIV 129
— crispis XIII 50; XIV 129
— ladaniferus XIV 129, 246-7
— monspeliensis XIV 129
— salvifolius XIV 129
Clarkia pulchella XII 151
Claytonia megarhiza XIII 295
— nivalis A.M. XII 154
— virginica XIV 144, 145
Clematis alpina XIII 305
— fusca XII 254-5
— montana XIV 40
— tangutica XIV 160, 296
— viticella XII 222
Clintonia alpina XIII 243
— borealis XIII 268
— udensis XIII 243
Cnicus esculentus XIV 159
Codonopsis meleagris XIII 238
— thalictrifolia XIII 284
Colchicum agrippinum XII 195; XIII 98, fig 21, 99; XIV 49
— alpinum XII 198, 200; XIII 98
— atropurpureum XII 203
— autumnale XII 195, 196, 198; XIII 98, fig. 22; XIV 49, 50, 295
— — 'Album' XII 200-201, 202
Colchicum autumnale 'Alboplenum' XII 201
— — atropurpureum XII 203
— — 'Minor' XII 201, 202
— — 'Plenum' XII 201
— — 'Rosea' XII 196
— 'Autumn Queen' XII 192, 197, 198, fig. 53
— 'Beaconsfield' XII 203
— bowlesianum XII 194, 195-6, 196, 200; XIII 99
— byzantinum XII 199, 201-2; XIII 99
— cilicicum XII 195, 196, 198-9, 200, 201, fig. 56; XIII 99
— 'Constable's Variety' XII 200
— 'Danton' XII 203
— 'Darwin' XII 203
— descaisnei XIII 99
— 'Disraeli' XII 197
— 'Daendels' XII 197, 326
— fasciculare XIII 99
— 'Fearndown Beauty' XII 203
— 'General Grant' XII 203
— giganteum XII 194, 196, fig. 54, 326; XIII 100
— hungaricum XIII 99
— 'Huxley' XII 203, fig. 59, 326
— illyricum XII 196
— — superbum XII 196
— kesselringii XIII 110, 116
— kotschyi XII 193
— laetum XII 200, 201, 202, fig. 57
— latifolium XII 196
— 'Lausanne' XII 203
— 'Lilac Wonder' XII 192, 199-200, fig. 58
— luteum XII 194; XIII 99, fig. 23
— 'Magnificum' XII 199
— 'Maximum' XII 199
— 'Mr. Kerbert' XII 200, 203
— parkinsonii XIII 99
— 'Premier' XII 200
— 'President Coolidge' XII 203
— 'Princess Astrid' XII 197
— 'Rosy Dawn' XII 197-8, fig. 55
— 'Rubens' XII 197, 203
— 'Ruby Queen' XII 203
— sibthorpii XII 194, 196; XIII 99
— speciosum XII 194, 196, 199, 225; XIII 99
— — 'Album' XII 194, 196, 202; XIII 100, fig 24; XIV 49
— — 'Atrorubens' XII 194, 197, 202, fig. 60
— — bornmuelleri XII 194, 199; XIII 98-9; XIV 49
— — illyricum XII 196
— szovitsii XII 193
— 'The Giant' XII 192, 198
— variegatum XIII 99
— 'Violet Queen' XII 192, 198; XIII 100
— 'Waterlily' XII 192, 196, 201; XIII 100; XIV 50
Conandron ramondioides XIV 8
Convolvulus mauritanicus XII 49
— nitidus XIII 53
Coprosma pumila XIII 38
Cornus canadensis XII 256; XIII 268, fig. 83; XIV 47
— florida XIV 144, 150
— nuttalli XIII 93
— suecica XII 256; XIII 71
Cortusa matthioli XII 311
— pekinensis XIII 89, 90
Corydalis cashmeriana XIII 133; XIV 33
— gorlshakowii XIII 111
— moorecroftiana XIII 116
— wilsonii XIV 208
Cotoneaster mongolica XIV 160
Cotula atrata XIV 221
Cremanthodium decaisnei XIII 285

Crocus albiflorus XII 11
— banaticus XIV 185, fig. 60
— biflorus XII 224
— corsicus XIV 20
— crewei XII 224
— iridiflorus XIV 185
— korolkowii XIII 110, 116
— medius XIII **142**
— nevadensis XIII 53, fig. 13
— scardicus XIV 22, 185, fig. 47
— vernus XII 11
Cruickshanksia glacialis XIII 37
— macrantha XIII 37
Cryptogramma crispa XIII 73; XIV 273
x Cupressocyparis leylandii XIII 130
Cupressus macrocarpa XIII 94, 130
— nootkatensis XIII 92
Cyathodes colensoi XIV 234
Cyclamen africanum XIII 279
— cilicicum XIV 314
— coum XIII 7, 137, 278; XIV 211
— creticum A.M. XIII 161
— — XIV 185
— europaeum XII 11, fig. 4; XIII 136, 279; XIV 211
— graecum XIII 279
— — F.C.C. XIV 71, fig. 22
— hederaefolium XIV 184-5
— libanoticum XIV 185, 314
— mirabile XIV 314, fig. 72
— neapolitanum XIII 7, 137, 279; XIV 184-5, 211, 314
— persicum XIII 279
— repandum XIV 211
— rhodense XIV 23
— rohlfsianum XIII 279
Cynomorium songaricum XII 176
Cypripedium acaule XIII 268; XIV 47
— calceolus XII 12; XIII 8; XIV 22, 181
— cordigerum XIV 188
— parviflorum XII 83
— pubescens XIII 268
— reginae XII 83; XIII 133; XIV 188
— spectabile XIV 47
Cystopteris fragilis XIV 271
Cytisus laburnus XIV 295

Dacrydium biforme XIV 226
— laxifolium XIV 222
Daphne blagayana XIV 31
— cneorum XIII 50, 304
— eximea XIII 7
— jasminea XIII 62; XIV 186
— mezereum XII 173, 309; XIII 304; XIV 232
— odora XIII 236
— oleoides XIII 65
— petraea XIV 186, 188
— — grandiflora XIII 10
— retusa XIII 211, 236; XIV 31
— striata XII 309; XIII 304
Daucus carota XIII 151
Delphinium ajacis XIV 277
— beesianum XIII 189
— brunonianum XIII 111
— consolida XIV 296
— dasyanthum XIII 111
— glaciale XIII 291
— grandiflora XIV 159
Dennstaedtia punctiloba XIV 275
Dentaria laciniata XIV 144
Dianthus alpinus XIV 297
— brachyanthus alpinus XIII 51
— brevicaulis XII 224
— callizonus XIV 77
— carthusianorum XIV 297
— deltoides 'Brilliant' XII 166
— eretmopetalus XII 224
— neglectus XII 10; XIII 34
— pindicola XIII 34
Dianthus sylvestris XIV 284
— versicolor XIV 65
Diapensia lapponica var. obovata XII 257
Diascia cordata XIV 249-50
Dicentra canadensis XII 84
— cucullaria XII 84; XIV 148, 150
— formosa XII 50
— peregrina pusilla XIV 26, fig. 10
Didissandra sericea XIII 39-40
Digitalis grandiflora XII 173
— obscura laciniata XIII 50
— purpurea nevadensis XIII 53
Dionysia aretioides XIV 189
— curviflora XIV 189
— freitagii XIII 111
— hedgei XIII 111
— janthina XIV 189
— lindbergii XIII 110
— michauxii XIV 189, 190, fig. 48
— microphylla XIII 110; XIV 189
— tapetodes XIII 110; XIV 189
— viscidula XIII 110; XIV 189
— zagrina XIV 189
Diosphaera asperuloides XIII 10
Diospyros virginiana XIV 144, 154
Dipcadi serotinum XIII 54, fig. 15; XIV 128-9
Dodecatheon meadia XII 88, 149
Dodonaea viscosa XIII 95
Donatia novae-zealandae XIV 222, fig. 64, 225
Douglasia laevigata XIV 164
— nivalis XII 147, 149
— vitaliana XII 10, 31, 187, 189, 269
Draba aizoides XII 172
— bruniifolia XII 223
— dedeana XIII 131
— dubia XII 172
— imbricata XIII 131
— kurilense XIII **89**, 90
— mollissima XIV 183
— oligosperma XIII 131
— rigida XIII 131
Dracocephalum bullatum XIII 214
— calophyllum XIII 214
— foetidum XII 178
— forrestii XIII 214
— isabellae XIII 171, 214
— menziesii XIII 93, XIV 224
— muscoides XIV 218
— pronum XIV 216, 219
Drapetes dieffenbachii XIV 218, 221
— lyallii XIV 221
Drosera menziesii XIII 93
— rotundifolia XII 89
Dryas octopetala XII 149, 172, 173, 309; XIII 304, 306; XIV 31, 250, 295
— pentapetala XIII 123
Dryopteris aemula XIV 273
— austriaca XIII 118
— borreri XIV 273
— crassirhizoma XIII 118
— dilatata XIV 273
— filix-mas XIV 273

Ebenus boissieri XII 223
Edrianthus pumilio XIII 131
Empetrum asiaticum XII 253; XIII 73
— kurilense XIII 73
— nigrum XII 253; XIII 73
Ephedra przewalskii XIII 325
Epigaea gaultherioides XIV 186
— repens XII 88; XIII 268, fig. 84; XIV 47
Epilobium conspersum XIII 289
— glabellum XIV **249-50**
— kaikoense XIV 250
Epimedium perralderianum XIII 140
— pinnatum XIII 140
Eranthis hyemalis XII 224; XIV 295
Eremurus kaufmannii XIII 116

Eremurus stenophyllus XIII 110
Eremus chinensis XIII 243
Erica XII 230-1
— arborea XIV 191
— bauera XII 25
— carnea XIII 304, 306; XIV 48
— cinerea XIV 191
— lusitanica XIV 48
— meadia variegata XII 25
— patersonii XII 25, fig. 13
— scoparia XIV 191
— woodii XII 26, fig. 14
Erigenia bulbosa XII 59
Erigeron alpicola XIII 72
— alpinus XIII 52
— dubius XIII 72
— thunbergii XIII 72
Erinacea anthyllis XIII 53, fig. 11
— pungens XII 321
Erinus alpinus XII 29, 173
Eriophytum wallichianum XIII 291
Eritrichium nanum XII 13, 167, 311; XIII 9-10; XIV 23, 218, 237, 279, 286-7, 290
Ermania flabellata XIII 112
Erodium cheilanthifolium XIII 51, fig. 9
Erysimum alpinum 'Moonlight' XII 235
— pumilum XIII 52
— sylvestre XIV 297
Erythrina caffra XII 26
Erythronium americanum XII 85; XIV 146. 147
— californicum XIII 7
— dens-canis XIV 20,31
— grandiflorum XII 59, 148
— 'Pagoda' XII 59
— tuolumnense XII 59
Eschscholzia californica XII 149; XIII 96
Euphorbia cyparisias XII 302
— pestalozzae XII 223
— robbiae XIII 140
— wallichii XIII 287, 290
Euphrasia revoluta XIV 222
Euryops acraeus XIV 233
— tysonii XII 26

Ferulago trachycarpa XII 224
Forstera tenella XIV 222
Fragaria virginiana XIV 151
Fritillaria cilicico-taurica XII 223
— cirrhosa XIII 243, 283, 292, fig. 65
— delavayi XIII 243
— gibbosa XIV 188
— graecum XIV 23
— guicciardii XIV 23
— hispanica XIII 52
— imperialis XIII 110; XIV 31, 149
— karelinii XIV 23, 188
— michaelovskii XIV 188
— nevadensis XIII 52, fig. 10
— pallidiflora XIV 209
— pyrenaica XIV 31
— souliei XIII 243

Gagea fistulosa XII 12, 172
— hispanica XIII 52
— liothardii XII 12
Galanthus 'Allen's Perfection' XII 208, fig. 69
— 'Atkinsii' XII 208
— 'Brenda Troyle' XII 208
— byzantinus XII 206
— caucasicus XII 205, 207
— — 'Three Leaves' XII 208
— 'Colesborne' XII 206, fig. 67
— corcyrensis XII 204
— 'Curley' XII 208, fig. 70
— elwesii XII 204, 205, 206, 224
— — 'Whitalli' XII 208
— graecus XII 204
Galanthus 'Hill Poe' XII 207, fig. 68, 326
— 'Hippolyta' XII 207
— ikariae XII 204, 208, 326
— 'Kew' XII 208-9
— 'Kite' XII 205, fig. 61
— 'Magnet' XII 205
— 'Melvillii' XII 208-9
— 'Merlin' XII 204, 206, fig. 66
— 'Mrs. Backhouse No. 12' XII 209
— nivalis XII 204
— — 'Boyd's Double' XII 206-7
— — 'Green Maid' XII 206, fig. 65
— — 'Lady Elphinstone' XII 207
— — 'Lutescens' XII 204, 207
— — 'Poculiformis' XII 204, 207
— — 'Pusey Green Tips' XII 205, fig. 62, 326
— — — x 'Scharlockii' XII 206
— — 'Reginae-Olgae' XII 204
— — 'Scharlockii' XII 205
— — 'Virescens' XII 206, fig. 63
— — 'Viridi-apice' XII 205
— 'Ophelia' XII 207, 326
— plicatus XII 204, 206, 209
— 'Robin Hood' XII 209
— 'Straffen' XII 209
Garrya elliptica XII 150
Gaultheria cardiosepala XIII 251
— crassa XIV 220, 225
— cuneata XIII 141, 250
— depressa XIV 216, 218, 228
— forrestii XIII 248
— hypochlora XIII 250
— miqueliana XIII 141
— nivea XIII 250
— notabilis XIII 249
— nummularia XIII 293
— nummularioides XIII 249
— procumbens XII 87; XIII 141
— prostata XIII 249
— pyrolifolia XIII 249, 250
— semi-infera XIII 293
— shallon XII 51
— sinensis XIII 250
— suborbicularis XIII 249
— tetramera XIII 250
— thymifolia XIII 251
— trichophylla XIII 250, 251
Genista albida XII 223
— anglica XII 165
— hispanica XII 28,30
Gentiana acaulis XII 9, 30, 172, 309; XIII 131; XIV 21, 234
— alpina XIII 52
— andrewsii XII 88
— asclepiadea XIII 305
— bavarica XIV 286
— bellidifolia XIV 222, 223
— x bernardii A.M. XII 246
— x bernardii XIII 180
— brachyphylla alba XIII 8
— bulleyana XIII 183
— campestris XII 309
— 'Caroli' XIII 132
— cephalantha XIII 182
— ciliata XIV 297
— clusii XII 9
— corymbifera XIV 216, 222
— cruciata XIV 295
— 'Devonhall' XIII 132
— divisa XIV 221, 225
— elwesii XIII 288
— farreri XII 279, 282; XIII 132
— favrati XII 237-8, XIV 286
— gentilis XIII 182
— georgei XIII 181
— 'Glendevon' XIII 132, 180
— heleni XIII 183
— heptaphylla XIII, 182
— hexaphylla XII 279, 282

Gentiana 'Inverleith' XIII 132
— kochiana XII 31
— lutea XII 309; XIV 295
— x macaulayi XIII 180
— microdonta XIII 182
— nivalis XII 173; XIV 293
— orbicularis XII **237-8**
— ornata XIII 8, 292
— patula XIV 219, 222, 225
— phyllocalyx XIII 287
— prolata XIII 290
— rhodantha XIII 183
— rigescens XIII 182
— saxosa XIV 228
— serotina XIV 219
— sikkimensis XIII 182, 290
— sino-ornata XIII 123, 132, 179 180, 183, 189, fig. 44, 211, 218, 236; XIV 234
— x stevenagensis XIII 180
— stragulata XIII 180, **181**, 182
— suboccu!ta XIII 183
— urnula XII 260
— verna XII 9, 29, 172, 238, 271, 272, 309; XIII 52; XIV 234, 296
Geranium grandiflorum XIII 139
— macrorrhizum XIII 139; XIV 32
— montanum XIV 296
— sanguineum XII 30
Gerbera anandria XIV 66
Geum anemonoides XIII 123
— calthaefolium XIII 122, 124
— dryadoides XIII 123
— montanum XIV 287, 289
— pentapetalum XIII 122, 123, 124
— reptans XII 12; XIV 23, fig. 9, 289-90
— uniflorum XIV 223
Gladiolus byzantinus XII 30; XIV 31
— communis XIII 53
Globularia bellidifolia XII 10, 28
— cordifolia XII 173; XIV 295
— nudicaulis XII 173, fig. 52
Gloxinia speciosa var. menziesii XIII 96
Goniolimon speciosum XII 177; XIV 65
Goodyera repens XIII 303
Gunnera magellanica XIII 136
— manicata XIII 136
Gymnadenia albida XII 310
— conopsea XII 310
Gymnocarpium dryopteris XIV **275**

Haastia pulvinaris XIII 49; XIV **183, 217**, 226
— recurva XIV 226
— sinclairii XIV 223, 225
Habenaria bifolia XII 311
Haemanthus natalensis XII 26, fig. 12
Halimium atriplicifolium XIII 50
Hamadryas argentea XIII 37
Hamamelis virginiana XIV 154
Haplophyllum dahuricum XIII 324
Harrimanella stelleriana XIII 248
Hebe cheesemanii XIV 217
— ciliolata XIV 220
— decumbens XIV 216
— epacridea XIV 217
— hulkeana XIV **247**
— macrantha XIV 220
— menziesii XIII 93
Hectorella caespitosa XIV 218, 221
Hedysarum komarovii XIII 73
Helianthemum nevadense XIII 52
Helleborus corsicus XIII 134, 135
— cyclophylla XIII 134
— foetidus XII 30; XIII 134, 139
— niger XIII 134, 139
— orientalis XIII 139
Helichrysum bellidioides XIV 221
— coralloides XIV 226
— depressum XIV 216
— humile XII 22
Helichrysum microphyllum XIV 217
— milfordiae XIV 21
— plumeum XIV 185
— selago XIV 217
— sesamoides XII 22
Hemerocallis forrestii XIII 243
— fulva XII 85; XIII 243
— nana XIII 243
— plicata XIII 243
Hepatica triloba XII 30, 84;
Heteropappus hispidus XIV 67
Hieracium villosum XII 173
Hippophae tibetica XIII 292
Hosta coerulea XIII 244
— fortunei XIII 141
— plantaginea XIII 244
— sieboldiana XIII 141
— ventricosa XIII 244
Huguenima tanacetifolia XIV **283**
Hyoscyamus niger XIV 296
Hypericum androsaemum XIV **248**
— calycinum XII 222; XIV **249**
— coris XIV 249
— fragile XIV 249
— humifusum XIV 248
— minutum XIV 249
— olympicum XIII **142**
— polyphyllum XIII **142**
Hypolepis millefolium XIV 276
Hypoxis hirsuta XII 86
Hyssopus officinalis XIV 296

Iberis sempervirens XII 187
Ilex crenata XIII 69
— intricata XIII 293
— radicans XIII 69
— rugosa XII 120
Impatiens biflora XIV 151
— sultani XIV 151
Incarvillea delavayi XIII 193
— grandiflora XIII 193, 238
— lutea XIII 212
— mairei 'Frank Ludlow' XIV 21
Inula britanica XIV 159
Ionopsidium acaule XIV 293
Ipomoea hederacea XIII 50
Iridodictyum winogradowii XIII **87-8**, 90, fig. 19
Iris XII **112-13**
— acutiloba XIII 44
— afghanica XIII **115-6**
— bungei XII 175
— chrysographes XIII 236
— florentina XIV 126
— forrestii XIII 236, fig. 56, 253
— gatesii XIII 44
— gibraltarica XII **236**
— gracilipes XIII 136
— histroides major XIV 20
— iberica XIII 44
— japonica XIII 236
— kaempferi XIII 136
— lortetti XIII 44
— medwediewii XIII 44
— microglossa XIII 116
— paradoxa XIII 43
— pseudacorus XII 224
— pumila XIII 66, 136
— — var. attica XIV 23
— sempervirens XII 236
— siberica XIII 253
— sisyrinchium XIV 126, 127
— tenax XII 149
— tigridia XII 177
— versicolor XII 86
— winogradowii XIII 7; XIV 20, 315 fig. 70
— xanthochlora XIII 116
— xiphioides XII 29
— xiphium XIII 53

Isopyrum anemenoides XIII 114
— farreri XIII 41
— thalictroides XII 59, **123**

Jankaea heldreichii XII 167; XIII 8, 39, 66; XIV 22
Jasminum beesianum XIII 189
— nudiflorum XIV 39
— primulinum XIV 292
Juniperus chinensis XII 253
— excelsa XII 222, 225
— foetidissima XII 224
— sabina XII 30, 175
— sargenti XII 253
Jurinea humilis XIII 51
— macrocephala XIII 284

Kalmiopsis leachiana XIV 186, 201
— — 'M. de Piniec' XIV 22-3, fig. 8, fig. 27
Kelseya uniflora XIII 34; XIV 184
Kerria japonica XIV 38

Lactuca alpina XIV 283
Lagerstroemia indica XIII 53
Lagochillus ilicifolius XIII 323, 324
Lathyrus humilis XIV 68
Lavendula spica XIV 296
— stoechas XIV 126
Ledum groenlandicum XII 88
— palustre XIII 96
Leibnitzia anandria XIV **66-7**
Leontodon boryi XIII 51
Leontopodium alpinum XII 10
— campestre XII 177
— himalayanum XIII 285, fig. 67
— kurilense XIII **121**, 124, fig. 34
— monocephalum XII 260
Leonurus lanatus XIII 323
— quinquelobatus XIII 323
Lepidium nanum XII 167
Lespedeza dahurica XIV 161
— hedysaroides XIV 161
Leucodendron argenteum XII 23
— salignum XII 25
Leucogenes grandiceps XIV 219, 225
Leucojum aestivum XII **42**; XIV 48
— autumnale XII **43-4**
— hiemale XII **43**
— nicaeense XII **43**
— roseum XII **43**
— trichophyllum XII 44; XIV 127
— vernum XII **42**, XIV 316, fig. 73
Leucospermum nutans XII 23
Leucothoe grayana XIII 120
Lewisia brachycalyx XIV 21, 248, 319-20
— 'Carol Watson' XIII 278
— 'Caribou Basin' XIII 278
— cotyledon, white form, A.M., XIII 161
— megarhiza XIII **295**
— mexicana XIII 295
— nevadensis XIV 248, 319-20
— 'Pinkie' XIII 278
— 'Phyllellia' A.M. XIII 161
— x phyllellia XIII 278
— rediviva XII 148
— x trevosiana XIII 278
— tweedyii XII 166; XIII 278
Lilium XII **108-10**
— auratum XIV 36
— bakerianum XIII 240
— brownii XIII 240
— canadense XII 85
— candidum XIII 65, 66
— davidii XIII 241, fig. 57
— duchartrei XIII 241
— forrestii XIII 240
— giganteum XIII 240, 282
— henrici XIII 241
— japonicum XIII 266

Lilium krameri XIV 283
— lankonense XIII 240
— mackliniae XIV 35
— martagon XII 311; XIV 296
— papilliferum XIII 241
— philadelphicum XII 85;
— primulinum XIII 241
— regale XIV 36
— sherriffiae XIII 243
— stewartianum XIII 241
— sulphureum XIII 240
— superbum XII 85
— taliense XIII 241
— tigrinum XIII 241; XIV 38
Limonium flexuosum XII 177
Linaria alpina XII 29, 172, 187; XIV 293
— cymbalaria XII 302
— nevadensis XIII 51
— tournefortii XIII 50
— vulgaris XIV 151
Linnaea borealis XII 51; XIII 303; XIV 276
Linum montanum XIV 296, 297
— narbonense XIII 53
Liriodendron tulipifera XIV 144, 154
Listera convallarioides XIII 120
— major XIII 120
— savatieri XIII 120
— yatabei XIII 120
Lithocarpus pachyphylla XIII 178
Lithospermum diffusum XII 31
Lloydia delavayi XIII 244
— forrestii XIII 244
— serotina XII 172; XIII 121, 244
— tibetica XIII 244
— triflora XIII 121
— yunnanensis XIII 244
Lobelia linnaeoides XIV 221
Loiseleuria procumbens XII, 12
Lonicera caerulea XIII 118
— pyrenaica XII 28
Lupinus arboreus XIII 96
— perennis XII 86
— polyphyllus XII 148
Lychnis inflata XIII 291
Lycopodium complanatum XIV 148
Lysichitum americanum XIII 136
— camtschatcense XIII 136

Macrotomia echioides XIII **88**, 90
Magnolia campbelli XIII 235
— mollicomata XIII 235
Mahonia lomariifolia XIII 234
Maianthemum bifolium XII 86, 173
— canadense XIII 268
Malva moschata XIV 297
Matteuccia struthiopteris XIII 118; XIV 276
Meconopsis baileyi XIII 246
— bella XIII 289
— betonicifolia XII 50; XIII 188, 246
— delavayi XIII 246
— forrestii XIII 245
— georgei XIII 245, 246
— grandis XIII 135, 283
— horridula XIII 135, 236, 245, 285, 291
— impedita XIII 246
— integrifolia XIII 135, 188, 235, 246, fig. 50; XIV 36
— lancifolia XIII 246
— lyrata XIII 246, 289
— napaulensis XIII 135, 246
— paniculata XIII 283
— prattii XIII 246
— pseudovenusta XIII 246
— quintuplinervia XII 282
— racemosa XIII 246
— rudis XIII 246
— x sheldonii XIII 135
— simplicifolia XIII 283
— sinuata XIII 289
— speciosa XIII 246

Meconopsis venusta XIII 246
— wallichii XIII 246
Megacarpaea delavayi XIII 214
Menziesia caerulea XII 141
— ferruginea XIII 94
Merendera bulbocodium XIII 100
— montana XIII 53, fig. 12
Mercurialis perennis XIII 120
Mertensia pterocarpa XIII 121, 122, 124
— rivularis XIII 122
Michelia doltsopa XIII 178
Mimetes lyrigera XII 24
Mimulus lewisii XIII 136
— moschatus XII 151
Minuartia dianthifolia XII 224
— pestalozzae XII 225
Miscanthus sinensis XIII 71
Monarda didyma XII 89
Moneses uniflora XII 13, 174; XIII 136
Monotropa uniflora XII 87
Muehlenbeckia axillaris XIV 218
Muscari atlanticum XIV 127
— botryoides XIV 297
— comosum XIV 127
Mutisia decurrens XIII 36
— oligodon XIII 36
Myosotis alpestris XIV 296, 297
— colensoi XIV 222
— decora XIV 223
— explanata XIV 222
— hispida XIII 52
— lyalli XIV 225
— pulvinaris XIV 218
— traversii XIV 217
Myrica gale XIV 29
Myricaria rosea XIII 283, 292, 293

Narcissus bulbocodium XIII 133; XIV 127, 209
— calcicola XIII 8; XIV 127
— cantabricus petunioides XIII 8
— cyclamineus XIII 141
— minimus XIII 7
— papyraceous XIV 127
— pseudonarcissus XII 31; XIV 296
— tazetta XIV 127
— triandrus albus XIV 209
Nemophila insignis XII 150
— menziesii XIII 94
Nepeta sibirica XII 178
Nigritella nigra XII 311
Nitraria sibirica XII 176
— sphaerocarpa XII 176
— roborowskii XII 176
Nomocharis aperta XIII 188, fig. 42, 236, 241-2
— basilissa XIII 40, 242
— forrestii XIII 188, 242
— georgei XIII 242
— mairei XIII 241, 242
— meleagrina XIII 242
— pardanthina XIII 188, 236, 241, 242
— saluensis XIII 188, 236, 242
— souliei XIII 188
— synoptica XIII 242
Notholirion bulbuferum XIII 242
— campanulatum XIII 242
— hyacinthinum XIII 242
— macrophyllum XIII 242
— thomasianum XIII 242
Notothlaspi rosulatum XIV 26, 217, fig. 62
Nuphar lutea XII 224
Nymphaea alba XII 224

Omphalodes luciliae XII 223; XIII 33
— verna XIII 141
Omphalogramma elegans XIII 203
— elwesiana XIII 203
— souliei XIV 22
— vincaeflora XIII 203, fig. 46, 254

Onobrychis cornuta XII 223
Onoclea sensibilis XIV 276
Ononis cenisia XII 187
— fructicosa XII 273
— macrosperma XII 223
Onosma echioides XIII 53
Ophelia papillosa XII 255
— tetrapetala XII 255
— yesoensis XII 255
Ophrys bombyliflora XIV 124
— fuciflora XII 271
— lutea XIV 124-5
— scolopax XII 30
— speculum XIV 124-5
— tenthredinifera XIV 124
Orchis globosa XII 311
— laxiflora XII 224; XIII 63
— majalis XII 30
— mascula XII 310
— militaris XII 272; XIV 296
— sambucina XII 11, 29, 271, 272
— — f. purpurea A.M. XII 154
— ustulata XII 271
Oreobroma megarhizum XIII 295
— mexicanum XIII 295
Orobanche caerulescens XII 175
Orostachys spinosa XIV 65
— thyrsiflora XII 178
Osmunda regalis XIV 275
Ourisia caespitosa XIII 136; XIV 219, 221
— — gracilis XIII 49
— glandulosa XIV 218, 219, 225
— macrocarpa XII 49; XIV 222
— macrophyllum XIV 222
— sessilifolia XIV 225
Oxalis laciniata XIV 69
— oregana XIII 140
Oxytropis austrosachalinensis XIII 124
— kamtschatica XIII 123
— megalantha XIII 123
— oxyphylla XIV 68, 160
— pumila XII 178
— retusa XIII 121, 123, 124
— rubricaudex XIII 123
— tragacanthoides XII 178

Pachysandra terminalis XII 49
Paeonia mascula XII 224
Paliurus spinachristi XIII 60
Panax schinseng XII 256
Pancratium illyricum XIV 24
— maritimum XIV 24
Panzeria lanata XIII 323
Papaver involucratum XIII 114
— miyabeanum XIV 205
— nudicaule XIV 65
— rhaeticum XII 186
— rhoeas XIV 297
— rubro-aurantiacum XII 176, fig. 49
— spicatum XII 224
Paradisea liliastrum XII 173
Parahebe trifida XIV 219
Paraquilegia anemonoides XIII 253; XIV 24, 187
— grandiflora XIII 41, 111, 114, 238, 253
Parnassia nubicola XIII 136
— palustris XIII 136; XIV 297
Parochetus communis XIII 288
Paronychia argentea XIV 126
— serpyllifolia XII 28, 187
Patrinia hispida XIII 72
— parviflora XIII 72
— scabiosaefolia XIII 72
— serratulaefolia XIII 72
— sibirica XIII 72
Pedicularis flava XII 177
Pentachrondra pumila XIV 219, 228
Penstemon heterophyllus XII 150
— menziesii XIII 94
— scouleri XII 293

Perezia megalantha XIII 300
Pernettya mucronatum XIV 29
— nana XIV 218
— tasmanica A.M. XIII 79
Petrophytum hendersonii XIII 131; XIV 181
Phaenocoma prolifera XII 24
Phlomis grandiflora XII 224
Phlox 'J. A. Hibberson' XIII 276
— pilosa XII 89
— subulata XII 169
— triovulata XIII 34; XIV 187
Phormium colensoi XIV 226
— tenax XIV 226
Phygelius aequalis XII 26
Phyllachne colensoi A.M. XII 154
— colensoi XIV 218, 222
— rubra XIV 218
Phyllitis scolopendrium XIV 271
Phyllodoce aleutica XII **143**, fig. 43
XIV **193-202**
— x alpina XII 143-5; XIV 200
— breweri XII 141, **142**, fig. 39
XIV **193-202**
— caerulea XII **141-2**, 143;
XIV **193-202**
— empetriformis XII **142**, 143;
XIV **193-202**
— glanduliflora XII **142-143**, fig. 40
— x hybrida XIV 200
— x intermedia XII **143**, fig. 42;
XIV 198-200
— nipponica XII **143**, fig. 44
XIV **193-202**, 234
— tsugaefolia XII **143**
— taxifolia XII 141
x Phyllothamnus erectus XIV 201, 234
Phyteuma comosum XII 263, fig. 78; XIII 9, 131; XIV 24, 319
— halleri XII 28
— pauciflorum XIV 287
Phytolacca americana XIV 151
Picea sitchensis XII 150; XIII 96
Pieris 'Forest Flame' XIII 233
— forrestii XIII 193, fig. 50, 211, 233
Pine Barrens (New Jersey) XII **52-56**, fig. 22
Pinguicula alpina XII 311; XIII 305;
XIV 296
— grandiflora XII 29, 31; XIV 22
— vulgaris XII 311; XIV 297
Pinus banksiana XIII 130
— cembra XIV 283-4, 285
— contorta XIII 130
— insignis XII 150
— montana XIV 284, 285
— mugo XIII 304
— — var. mughus XIII 130
— ponderosa XIII 130
— radiata XIII 94
— strobus XIII 130
— sylvestris XIII 130
Plantago nivalis XIII 52
— subulata nevadensis XIII 51
Platanthera tipuloides XIII 71
Platycodon mariesii XIV 31
Pleione bulbocodioides XIV 25
— forrestii XIII 184, fig. 40, 215, 253;
XIV **25**
— limprichtii XIV 25
— pogonioides XIV 23, 25, fig. 28
— yunnanensis XIII 238; XIV 25
Pleurophyllum speciosum XIII 38
Podocarpus nivalis XIV 220
Podophyllum peltatum XII 84; XIV 148
Polygala chamaebuxus XIII 304
— comosa XIII 51
— paucifolia XIII 268
Polygonatum biflorum XII 86
— curvistylum XIII 244
— fuscum XIII 244
— officinale XIV 66
Polygonatum stewartianum XIII 244
— ucinatum XIII **244**
— verticillatum XII 28
Polygonum affine XIII 285
— emodi XIII 290
— frutescens XIII 322
— vaccinifolium XIII 285; XIV **247-8**
— viviparum XII 256
Polypodium vulgare XIV **271**
Polystichum aculeatum XIV **273**
— lonchitis XIV **273**
— setiferum XIV 273
Potentilla arbuscula XIII 286
— dickinsii XII 258
— fructicosa XIII 286
— — var. farreri XII 282
— microphylla var. achillifolia XIII 284
— — var. depressa XIII 285
— multifida XII 178
— nitida XII 10; XIII **41**
— palmirica XII 178
— saxifraga XII 273
— sericea XII 178
— sibirica XII 178
Primula XII 264
— agleniana XIII 235
— algida XIII **108**
— allioni XII 182, 183, 272; XIII 7, 107, 108, 276; XIV 186, fig. 46
— alpicola luna XII 235
— — violacea XII **231-2**
— altaica grandiflora XII 232
— amethystina var. brevifolia XIII 200
— amoena XIII 107
— anisodora XIII **106**, 197, 201, 219, 234
— apennina XII **104**; XIII 107
— apoclita XIII **109**, 202
— aurantiaca XII **306**; XIII 197, 198, 201
— aureata XII 304; XIV 7, 184
— auricula XII 172 180 183, 184, 264, 310
— auriculata XII **305**; XIII 114
— balbisii XII 263
— bauhini XII 104
— beesiana XIII 197, 201, 211, 234
— x berninae XII 104; XIII 107
— x biflora XII 104; XIII **106**
— x bilekii XII **105**, 183
— boothii XII 304, **305**
— bracteosa XII 304, **305**; XIII 198
— bulleyana XII 232, **306**; XIII 189, fig. 49, 197, 201, 211, 216, 217, 234
— burmanica XII 306, **307**; XIII 201, 235
— buryana XIII 284
— calderiana XII 235; XIII 288
— calycina XIII 107
— capitata XIII 201
— capitellata XIII 113, 114
— carniolica XII **104-5**, 183
— cawdoriana XIII 235
— chionantha XII 233; XIII 197, 198, 202, 211, 235
— chrysopa XII **235**
— chumbiensis XII 306
— chungensis XII **106**, 232
— x chunglenta XII 232
— clusiana XII 183; XIII **106-7**
— cockburniana XII 232
— columnae XII 107
— concholoba XII 305
— concinna XIII 285
— cortusoides XII 305
— cuneifolia XIII 41, 42
— cunninghamii XII 304
— darialica XII **106**
— dechsmannii XII **104**
— deflexa XIII 202
— deleiensis XII 306
— denticulata XII 106, 231, 307, XIV 27

Primula dinarica XII 106
— dryadifolia XIII 34; XIV 23
— dubernardiana XIII 187
— eburnea XIII 108
— edgeworthii XII 106-7, fig. 26, 304, 305; XIV 316-7
— — alba XII 304
— elatior XII 30, 173, 272
— ellisiae XII 305
— 'Ethel Barker' XII 183; XIII 107
— 'Excelsior' XII 232
— farinosa XII 12, 28, 29, 30, 107, 182, 271, 310; XIII 305, 306; XIV 296
— firmipes XII 305-6; XIII 203
— flexipes XII 306
— florindae XIII 109, 135
— forrestii XIII 108, 189, 193, figs. 47-8, 197, 200, 211, 212, 217, 235, 238-9
— x forsteri XII 183
— frondosa XII 106, 182
— gagnepainii XIII 109
— gambeliana XII 305
— gemmifera XIII 201
— geraniifolia XII 307
— glabra XIII 284
— glaucescens XII 183; XIII 106, 107
— glutinosa XII 105
— x Goebelii XII 180
— 'Gordon Harrison' XIII 108
— gracilenta XIII 202
— gracilipes XII 106; XIII 135
— grandis XII 307
— halleri XII 182
— helodoxa XIII 197, 201, 211, 219
— heucherifolia XIII 108
— hirsuta XII 172, 272; XIII 107
— — nivea XIII 105
— x Hyacinthia XII 184
— integrifolia XII 104
— x intermedia XIII 107
— 'Inverleith' XII 232
— involucrata XIII 202
— ioessa XIII 135
— 'Itton Court' XII 306-7
— japonica XIII 212
— — 'Etna' XII 231
— 'Joan Hughes' XII 184; XIII 108
— x juliana XIII 106
— x juribella XIII 7
— kingii XIII 200
— 'Ladybird' XII 232
— lanata XIII 109
— latisecta XII 234
— limnoica XII 106
— 'Linda Pope' XII 183, 307-8
— 'Lissadel' XII 232
— littoniana XII 217
— longiflora XII 107, 182
— luteola XII 231, 232
— macrophylla XII 304; XIII 114, 282, 291
— 'Maid Marion' XII 307
— malacoides XIII 188, 198, 218
— marginata XII 271, 272, 307; XIV 184
— — 'Beatrix Lascaris' XII 308
— — 'Drake's form' XII 183, 308
— — 'Jenkin's var.' XII 308
— — 'Pritchard's form' XII 183, 307
— 'Marven' XII 183; XIII 108
— matsumurae XII 256-7
— melanops XII 233
— 'Miller's Crimson' XII 306
— minima XII 105; XIII 7, 42
— mooreana XIII 107
— muscarioides XIII 202, 287
— nivalis purpurea XII 304
— nutans XII 304; XIII 197, fig. 54, 198, 203, 211, 234-5
— obconica XIII 199
— obtusifolia XII 305

Primula oculata XIII 109
— palinuri XII 234; XIII 276
— 'Pandora' XII 106-7
— parryi XII 107, fig. 27; XIII 135
— pedemontana XII 12, fig. 24, 305-6, XIII 107
— petiolaris XII 304; XIII 7
— pinnatifida XIII 191
— poissonii XIII 201, 219
— polyneura XII 233; XIII 201
— 'Postford White' XII 307
— 'Primrose' Types XII 107
— pubescens XII 105, 184, 307-8
— — 'Alba' XII 184; XIII 105
— — 'Blue Wave' XIII 105
— — 'Cedric' XIII 105
— — 'Christine' XII 184
— — 'Faldonside' XII 184; XIII 105
— — 'Janet' XIII 105
— — 'Marlene' XII 184
— — 'Mrs. J. H. Wilson' XII 92, 179, 184, 233; XIII 105
— — 'Red Indian' XIII 105
— — 'Ruby' XII 184
— — 'Rufus' XII 184
— — 'The General' XII 184; XIII 105
— pudibunda XII 233
— pulchella XIII 201
— pulverulenta XII 231, 232; XIII 135
— — 'Bartley Strain' XII 232
— pusilla XII 105
— 'Rankin 16' XII 106
— 'Red Hugh' XII 232, 233
— reidii XII 104; XIII 7, 235; XIV 225
— — williamsii XII 104; XIV 238
— reptans XIV 27, 173
— reticulata XIII 286
— rosea XII 231, 306;
— rubra XII 31, 105, 180, 183, 184, 233
— ruprechtii XII 305
— rusbyi XIII 107
— scapigera XII 106-7; XIII 106, 135
— scotica XII 106, 182
— secundiflera XII 235; XIII 203
— secundiflora XII 235; XIII 203
— sessilis XIV 317
— siberica XII 106
— sieboldii XII 231, 234; XIII 135
— — alba XII 231
— sikkimensis XII 233; XIII 135, 203, 282, 291
— sino-plantaginea XIII 202, 235
— sino-purpurea XII 233; XIII 202, 235
— 'Snow Cushion' XIII 106
— soldanelloides XIII 284
— sonchifolia XII 282, 307; XIII 135, 202, 235; XIV 184
— spectabilis XII 183; XIII 106
— spicata XIII 198, fig. 45
— strumosa XIII 282, fig. 64, 286, 291
— stuartii purpurea XII 304
— suffrutescens XII 107; XIII 41, 42
— takedana XIII 108
— taliense XIII 202
— tosaensis XIII 108
— tsariensis XII 231, 232
— tschuktschorum XIV 26, fig. 11
— tyrolensis XIII 7
— uniflora XIII 284
— 'Unique' XII 232
— uralensis XII 107
— venusta XII 183
— vernicosa XIII 202
— vialii XII 306; XIII 188, 197, 202, 211, 217, 234; XIV 31
— villosa XII 181, 183; XIII 106
— vincaeflora XIII 255
— viscosa XII 183, 233, 263, 272; XIII 106, 107
— — alba XII 104

Primula vulgaris XII 224, **232**
— waltonii XII 233; XIII 135
— wardii XIII 106
— warshenewskiana XII 306
— wattii XIII 106
— x wettsteinii XIII 107
— whitei XII 106; XIII 135; XIV 184
— wilsoni XII **307**; XIII 201, 219
— 'Windrush' XII 104
— winteri XIV 317
— x woronowii XII 107, 233
— wulfeniana XII 183
— yargonensis XII 231; XIII 135, 201
— yunnanense XIII 201
Protea aristata XII 23
— barbigera XII 23
— cynaroides XII 23
— repens XII 23
Prunella vulgaris XIII **143**
Prunus pedunculata XIV 160
— prostrata XIII 52
— serrula tibetica XIII 130
— spinosa XIII 122
Pseudotsuga menziesii XII 150, 294; XIV 40
Pteridium aquilinum XIV 191
Ptilotrichum purpureum XIII 52
— reverchonii XIII 278
Ptilotrichum reverchonii XIII 278
Pulmonaria angustifolia XIII 141
— officinalis XIII 141
— picta XIII 141
— rubra XIII 141
Pulsatilla alpina XII 309, **317**; XIV 295
— — var. sulphurea XII 10
— flavescens XIV **67**
— sulphurea XII 10
— taraoi XII **254**
— vernalis XII 11, 173, 309; XIII 9
— vulgaris XIV 297
Putoria calabrica XIII 50
Pygmaea ciliolata XIV 225
— pulvinaris XIV 221
— thomsonii XIV 218
Pyrethrum pulchrum XII 178
Pyrola asarifolia XIII 136
— elliptica XII 87
— media XIII 136
— rotundifolia XII 12
— secunda XIII 136
— uniflora XII 13
Pyxidanthera barbulata XII **52-56**, fig. 23; XIII **145-6**

Quercus agrifolia XIII 94
— garryana XIII 94
— lamellosa XIII 178
— lobata XIII 94

Ramonda myconi XII 31; XIII 8
Ranunculus XIII 25-29
— aconitifolius XII 172
— alpestris XIV 286
— brevifolius XII 224
— buchananii XIV 224, fig. 65
— demissus hispanicus XIII 51
— ensyii XIV 228
— glacialis XII 11, 172; XIV 24, 26, fig. 12, 279, 289
— haastii XIV 221
— hybridus XII 224
— insignis XIV 183, 216
— lyallii XIII 49; XIV 47, 216, 219, 222, 224, 228
— pachyrhizus XIV 218
— paucifolius XIV 183, 223
— pyrenaeus XII 172; XIV 291
— seguieri XII 11, fig. 3
— sericophyllus XIV 183, 220, 223, 224, 228
— shaftoana XIII 114
Raoulia australis XII 214, **217**; XIII 48
— bryoides XIII 49; XIV 217
— buchanani XIII 49; XIV 225, 228
— eximia XII fig. 25; XIII 49; XIV 183, fig. 59, 220, 221, fig. 63
— glabra XII 214, **216-17**
— grandiflora XIII 48; XIV 222
— haastii XII 214, **215**; XIII 48
— hectori XIV 218, 221
— hookeri XII 214, **215**
— lutescens XIII 48
— mammillaris XIII 49, 278; XIV 226
— tenuicaulis XII 213, 214, **215**; XIII 48
— youngii XIV 221
Restella cyanea XII 255
Rheum alexandrae XIII 213
— nobile XIII 285, 287
Rhodiola heterodonta XIII **89**, 90
— linearifolia XIII **89**, 90
Rhododendron XII 226-9
— cuttings XII **77-83**; XIII **74-78**
— anthopogon XIII 287, 290
— anthosphaerum XIII 219
— aperantum XIII 207
— arboreum XIII 290
— arizelum XIII 177
— augustinii XIV 40
— aureum XII **256-7**
— barbatum XIII 290
— beesianum XIII 189
— brachyanthum XIII 207
— bureavii XIII 192, 233
— californicum XIII 93
— calophytum XIV 232
— calostrotum XIII 208, 209
— campanulatum XIII 287, 290
— campylocarpum XIII 287, 290
— campylogynum XIII 192, 206, 207, 232; XIV 250
— — var. myrtilloides XII 282
— camtschaticum XII 257
— chamae-thomsonii XIII 206, 207, 208
— chamaeunum XIII 208
— chrysanthum XII **257-8**
— chryseum XIII 205, 207, 209
— ciliatum XIV 238
— cinnabarinum XIII 282, 290
— cremastum XIII 206
— curvistylum XIII 206
— davidsonianum XIV 86, 91
— eclecteum XIII 219
— eriogynum XIII, 177
— exquisitum XIII 233
— fastigiatum XIII 192, 207, 232
— ferruginium XII 263, 272; XIII 305
— fictolacteum XIII 233
— fletcherianum XIII 207
— forrestii XII 293, **318-20**; XIII 192, fig. 41, 207, **208**, 233
— — repens XIV 31
— giganteum XIII 192
— grande XIII 282
— griersonianum XIII 177
— haematodes XIII 207
— hippophaeoides XIII 206, 207, 209
— hirsutum XII 174; XIII 304, 305
— hodgsonii XIII 282
— impeditum XIII 207, 232
— intricatum XIII 207
— keleticum XIII 208, 209
— lacteum XIII 177
— lepidostylum XIII 208, 233
— lepidotum XIII 207
— leptothrium XIII 177
— meddianum XIII 177
— megeratum XIII 192, 206, 233
— microleucum XIII 207, 232
— micromeres XIII 207
— microphytum XIII 206
— nivale XIII 292

Rhododendron officinale XII **257-8**
— oleifolium XIII 208
— oreotrephes XIII 219, 233
— ponticum XII 222
— primulaeflorum XIII 206
— prostratum XIII 192, 208, 209, 233
— proteoides XIII 208
— pumilum XIII 293
— puralbum XIII 233
— racemosum XIII 192, fig. 51, 206, 208, 233
— radicans XIII 192, 208
— repens XIII 208
— roxieanum XIII 208
— rubiginosum XIII 219
— russatum XIII 206, 207, 232
— saluense XIII 192, 208
— sanguineum XIII 192
— sargentianum XIV 36
— scintillans XIII 207, 232
— setosum XIII 287, 292
— shweliense XIII 206, 207
— simsii XIII 206
— sinogrande XIII 177
— souliei XIII 233
— spinuliferum XIII 233
— stictophyllum XIII 206, 207
— sulfureum XIII 206
— telmateium XIII 207
— tephropeplum XIII 206
— thomsonii XIII 290; XIV 232
— trichocladum XIII 208
— trichostomum XIII 206, 232
— vaccinioides XIII 293
— valentinianum XIII 177, 205, 207, 233
— virgatum XIII 208
— williamsianum XIII 176
— yunnanense XIII 232
Rhodohypoxis XIII 133
— baurii XII 26
Rhodothamnus chamaecistus XII 263; XIII 280, 304; XIV 186, 201
Rhus ambigua XIII 117, 119
— glabra XIV 152, 153
— radicans XIV 154
— typhina XIV 153
Ribes aureum XIV 162
— diacantha XIV 162
— latifolium XIII 118
— sanguineum XII 149, 294
— speciosum XIII 96
Rindera lanata XII 225
Romanzoffia sitchensis XIII 136
— unalaschensis XIII 136
Rosa XIII 101-105
— moyesii XIV 36
— nutkana XIII 92
Roscoea alpinum XIII 213
— cautleoides XIII 213, 236
— humeana XIII 213, 236
— purpurea XIII 213, 236, 237
Rubia cordifolia XIV 162
Rubus nepalensis XIII 293
— nutkanus XIII 92

Salix apoda XIII 136
— fargesi XIII 136
— hastata XIII 136
— herbacea XIII 136; XIV 218
— lanata XIII 136; XIV 20
— reticulata XIII 136
— retusa XIII 136
Salvia bulleyana XIII 216
Sambucus canadensis XIV 151
Sanguinaria canadensis XII 85; XIV 146
Saponaria ocymoides XII 270; XIV 296
— pumilio XII 223
Sarracenia purpurea XII 89
Sasa paniculata XII 253; XIII 117;
— spiculosa XII 258
Sassafras albidum XIV 144, 153
Satyrium cordifolium XII 24
Saussurea alpina XII 177
— gossypiphora XII 285, 286, 287, 289
— riederi XII 254
— salicifolia XIV 162
Saxifraga aizoon XII 31, 172; XIV 286
— androsacea XII 172
— apiculata XIV 31
— azoides XII 300; XIV 285
— biflora XIV 289
— brunoniana XIII 286, fig. 71
— burseriana x crenata XIII 131
— — 'Gloria' XIII 131
— — sulphurea XIII 131
— caesia XII 173, 263
— cernua XII 177
— cochlearis XII 272
— cortusifolia XIII 119
— cotyledon XII 31
— cymbalaria XIV 293
— diapensioides XIII 131; XIV 276
— engleriana XII 260
— 'Faldonside' XIII 131
— florentula XIV 102, 283
— fortunei XIII 119
— hostii XII 173
— iratiana XII 31
— x irvingii XIII 131
— x jenkinsae XIII 131
— juniperifolia XIII 88, 90
— lingulata bellardii XII 271, 272
— — var. lantoscana XII 27, 271, 272
— longifolia XII 27, 29, 31, fig. 16, 273, XIII 131
— x megaseaeflora XIII 131
— mutabilis XIII 119
— nakaoi XIII 284
— nevadensis XIII 52
— oppositifolia XII 12, 172, 187; XIII 131; XIV 245-6
— paniculata XII 172
— pseudopallida XIII 284
— punctata XIII 119
— reniformis XIII 119
— seguieri XII 173
— 'Southside Seedling' XIII, 131
— 'Tumbling Waters' XII 27, 271; XIII 131
— umbrosa XII 167
Schizocodon soldanelloides XIII 133
Schizonepeta multifida XIV 65
Schizostylis coccinea XIV 248
Schotia brachypetala XII 26
Scilla biflora XII 30, 224; XIV 127
— monophylla XIV 127
— roseni XIII 88, 90, fig. 20
Scutellaria grandiflora XII 178
Sedum oreades XIII 289
Sempervivum arachnoideum XII 10, 31, fig. 2; XIV 282-3
— — var. transalpinum XIV 282
— calcaratum XIV 282
— calcareum XIV 282
— gaudinii XIV 282
— laggeri XIV 282-3
— montanum XIV 285
— nevadense XIII 52
— reginae-amaliae XIV 282
— rubicundum XIV 282
— tectorum XIV 282
— triste XIV 282
— wulfenii XIV 282
Senecio bellidioides XIV 224
— cannabifolius XIII 117
— doronicum XII 173; XIV 286, 290
— lyallii XIV 222
— revolutus XIV 229
— scorzoneroides XIV 220, 221, 222 225,
Sequoia sempervirens XIII 94

Setapis lingua XII 31
Serruria florida XII 23
Serrulata salicifolia XIV 162
Seseli peucedanoides XII 224
Shortia galacifolia XIII 133
— uniflora XIII 133
Sibbaldianthe sericea XII 178
Sieversia calthifolia XIII 122
— dryadoides XIII 123
— pentapetala XIII 123, 131
Silene acaulis XII 173, 223
— boryi XIII, 53
— elisabethae XIV 47
— hookeri XIV 248
— laciniata XIII 42
— plankii XIII 42
— rupestris XIII 52; XIV 287
Sisyrinchium angustifolium XII 86; XIV 250
— bermudiana XIV 249-**50**
— brachypus XIV 250
— depauperatum XIII 300
Smilacina racemosa XII 85
— stellata XII 86
Soldanella alpina XII 11, 309-10; XIII 9; XIV 297
— minima XII 310
— pusilla XII 310
Solidago juncea XII 90
Sophora tetraptera XIII 95
Sorbus aucuparia XIV 192
— chamaemespilus XIII 305
— decora XIII 121
— maderense XIV 191
— sambucifolia XIII 121, 122, 124
— sitchensis XIII 121
Soroseris pumila XIII 291
Spartium junceum XII 272
Spiraea betulifolia XIII 118
— douglasii XII 50
— hendersoni XIV 181
— menziesii XIII 94
Spiranthes grayi XII 255
— sinensis XII 255-6
Statice flexuosa XII 177
Stellaria decumbens var. pulvinata XII 260
Stellera cyanea XII 255
Stranvaesia davidiana XIII 131
Strelitzia reginae XII 23
Swainsonia novae-zealandae XIV 226
Swertia bissetii XII 255
— multicaulis XIII 284
— pallasii XII 255
— tetrapetala XII 255
— yesoensis XII 255
Symphyandra cretica XII 167
Symplocarpus foetidus XII 84; XIII 118, 119
— renifolius XIII 118, fig. 31, 119
Synthyris canbyi XIII 43
— lanuginosa XIII 43
— pinnatifida XIII 43
— platycarpa XIII 43
— schizantha XIII 43

Tanacetum densum 'Amini' XIV 165
Tellima grandiflora XIII 140
Teucrium montanum XII 224
Thalictrum dipterocarpum XIII 236
— elegans XIII 283
— foetidum XIII 325
— virgatum XIII 286
Thelymitra crosby-smithii XIV 216
Thelypteris limbosperma XIV 275
— phegopteris XIII 303; XIV 275
Thesium alpinum XII 173
Thlaspi kotschyanum XII 223
— perfoliatum XII 223
— papillosum XII 223
— rotundifolia XII 172, fig. 50; XIII 51
Thymus cilicicus XIII 8; XIV 185
— nitidus XII 28; XIV 232
Thymus serpyllum XII 178
Tiarella cordifolia XIII 140
— wherryi XIII 140
Tofieldia nutans XII 257; XIII 121
— yunnanensis XIII 244
Tolmiea menziesii XIII 94
Tricercandra quadrifolia XIII 120
Trichomanes reniforme XIII 39
Trillium acuminatum XIII 13
— affine XIII 19
— atropurpureum XIII 13
— balduinianum XIII 13
— brevipes XIII 13
— californicum XII 17
— camtschaticum XII 59
— catesbaei XIII **18-19**, fig. 2
— cernuum XII 86, **122**, fig. 38; XIII 13, 19
— chloropetalum XII **17-19**, fig. 8, fig. 9
— crassifolium XII 17
— cuneatum XII **119**
— declinatum XII 123; XIII 13
— decumbens XIII 14
— erectum XII 58, 86, **119-21**, fig. 36, fig. 37; XIII 13, 16
— flexipes XII **122-23**
— gleasoni XII 123
— grandiflorum XII 58, 86, **115-16**, fig. 28, fig. 29, 121
— x hibbersonii XII **20**
— hugeri XII 119
— lancifolium XIII **14**
— ludovicianum XIII **15**
— luteum XII 58, 59
— nervosum XIII 18
— nivale XII **121**; XIV 23
— ovatum XII **16-17**, fig 5, fig 6
— ozarkanum XII 122
— petiolatum XII **17**
— pusillum XII **121-22**; XIII 19
— rectistamineum XIII **14-15**
— recurvatum XII 17, **118**; XIII 14; XIV 149, 150
— rhombifolium XIII 13
— rivale XII **19-20**, fig. 10, 121; XIV 23, fig. 17, 187
— rugelii XIII **16-18**
— scouleri XII 17
— sessile XII 19, **117-18**, fig. 30; XIII 14, 15; XIV 150
— simile XIII 16
— stamineum XIII **14**
— stenanthes XIII 13
— stenosepalum XII 17
— stylosum XII 58; XIII 18
— tschonoskii XIII 244
— underwoodii XIII **15-16**
— undulatum XII 58, **116-17**
— vaseyi XIII **16**
— venosum XII 17
— viride XII **118-19**; XIII 15
Trollius europaeus XII 174; XIII 305; XIV 296
— 'King Cup' XIII 214
— pumilus XIII 285
— yunnanensis XIII 213, 214
Tropaeolum polyphyllum XIV 31
Tsuga albertiana XIII 96
Tulipa australis XII 272; XIV 127
— biebersteiniana XII 223
— celsiana XIII **53**
— linifolia XII **238**
— montana XII 224
— sylvestris XIV 296
— turkestanica XIII **144**, fig. 36
Tussilago anandria XIV 66

Ulmus oregana XIII 93
Urceolina urceolata XIII 36
Utricularia monanthos XIV 225

Vaccineum canadensis XII 51
— chaetothrix XIII 251. 252
— delavayi XIII 252
— dendrocharis XIII 252
— maderense XIV 191
— modestum XIII 252
— myrtillus XIII 303, 305; XIV 191
— nummularia XIII 251. 252
— parvifolium XII 51
— sikkimense XIII 252
— vitis-idaea XIII 141, 252, 303, 305
Valeriana fedtshenkoi XIII 116
— saichanensis XII 178
— sibirica XIII 72
Vella spinosa XIII 53
Verbascum adenocarpum XII 225
— 'Letitia XIV 185
Veronica aphylla XII 173
— alpina XII 173
— incana XIV 66
— latifolia XII 172
— schmidtiana XIII 90
Viburnum farreri XII 282
— fragrans XII 279, 282
Vicia costata XIII 324
Vinca diformis XIV 126
Vincetoxicum officinale XII 173
Viola alata XIII 71
— biflora XII 173, 311; XIII 119
— calcarata XII 172. 272
— canadense XII 87
Viola canina XII 29
— cazorlensis XIII 9; XIV 187
— cenisia XIII 9
— cucullata XII 87
— cunninghamii XIV 222
— japonica XIII 71
— lutea XII 31, 173
— nevadensis XIII 51
— pedata XII 87; XIII 133
— petraea XIII 35
— pubescens XII 87
— selkirkii XIII 90
— umbrosa XIII 90
— verecunda XIII 71
Virgilia capensis XII 25
— oroboides XII 25

Wahlenbergia albo-marginata XIII 49; XIV 216
— brockei XIV 223
— cartilaginea XIV 217, 226
— serpyllifolia XIII 131
Waldheima glabra XIII 291
Watshonia pyramidata XII 24, 25
— stenosiphon XII 25
Weigela middendorffiana XIII 118
Wulfenia orientalis A.M. XII 154

Zantedeschia africana XII 24
Zauschneria californica XIII 96

Dr. CARL R. WORTH

JUST as this *Journal* was going to press, information was received that Dr. C. R. Worth had died on 21 May 1975.

Those who attended the 1961 International Rock Garden Conference will remember Dr. Worth who contributed papers both in London and in Edinburgh. He was a regular contributor to our Seed Exchange and will be remembered for his collection of plants from the Rocky Mountains.

He was, for many years, Editor of the *Bulletin* of the American Rock Garden Society.

He was Professor of Mathematics at Ithaca College from 1954 to 1969. He also taught at the University of Arkansas and at Rutgers University. He held degrees from the South-West Missouri State University, from the University of Chicago and from the California Institute of Technology.

During World War II he served with the American Naval Reserve, attaining the rank of Commander.

Lincolnshire County Council Education Committee

An Alpine-Gardening Weekend will be held at the Horncastle Residential Centre on November 21st - 23rd, 1975.

Speakers will include: Mr. Ken Aslet
Mrs. Kathleen Dryden
Mr. Roy Elliott
Mr. Christopher Grey-Wilson

Details may be obtained from the Warden, Mr. Brian Jenkins, at the Residential College, Horncastle, Lincolnshire. There is a limited number of places; first come, first served.

W. C. Henderson & Son Ltd., St. Andrews

Fairways & Swinford's Autumn Holidays 1975

FARAWAY TURKEY—A Unique Experience: £350
29 *September to* 17 *October with Professor R. J. Hopper, M.A., Ph.D.*
This holiday, primarily intended for those who enjoy seeing and photographing wild, spectacular mountain scenery and visiting exciting, little known sites, mosques and Crusader castles, is nevertheless of interest to seed collectors also, since the countryside abounds in rare plants and flowers. The itinerary begins with a day or two in Ankara and continues by way of Malatya and Diyabakir to Mount Nemrud, famous for the gigantic statues to be found at its summit, and to Gaziantep, founded by Justinian in the VI century. Then, bearing southwards, we spend some days at Antioch with its Early Christian churches and mosaics and great castle at Bagras; after which we drive to the Hittite hill site at Karatepe and on through Tarsus to Silifke on the seashore backed by snowcapped mountains. Here we spend four days enjoying the mellow autumn sunshine and visiting the fortress castle and site at Anamur, before driving back to Ankara by way of the beautiful Early Christian monastery complex at Alahan. This itinerary really is unique in interest and beauty.

FIVE NILE CRUISES
There is no better nor more restful way of seeing the landscape and antiquities of Egypt than by taking a leisurely river journey along the Nile. The *s.s. Lotus,* a happy, comfortable paddle-steamer, specially chartered for our voyage, carries about 45 passengers in single and twin-bedded cabins, all but six with their own facilities, and is ideal for the purpose. Each sailing is accompanied by a distinguished Egyptologist, our own Cruise Manager and an English doctor.
Cruise 91: October 6 to 26
Cruise 92: October 20 to November 9
Cruise 93: November 2 to 22
Cruise 94: November 16 to December 6
Cruise 95: November 29 to December 19
Prices, from £374 to £515, cover everything during the 21 days from London back to London, including scheduled flights to and from Cairo, where a few days are spent in sightseeing locally, and all visits and excursions from the ship.

HOLIDAYS IN 1976
A good range of holidays of interest to gardeners and botanists has been planned both in Europe and further afield, of which details will be available in the autumn. New centres have been found and every effort is being made to keep prices to a minimum as far as circumstances permit.

FAIRWAYS & SWINFORD (SRGS)

18 Saint George Street, London W1R 0EE
Telephone 01-629 6801

ATOL 491B