The Journal

OF

The Scottish Rock Garden Club

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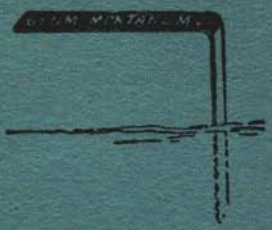

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THE JOURNAL

OF

THE SCOTTISH ROCK GARDEN CLUB

EDITED BY

H. R. FLETCHER

No. 8 1951

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THE SCOTTISH ROCK GARDEN CLUB

The Club's aims are to create an interest in Rock Garden Plants, and encourage their cultivation, especially amongst those who have only small gardens. Hundreds of such plants can be grown in a very small space, even in a few small frames, and there is no more fascinating hobby.

By becoming a member of this Club you are entitled to:

1. Receive the Journal and other publications.
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3. Free advice on cultivation, etc., by experts through the Club's Information Bureau.
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Editor's Notes

THERE can be no doubt but that the highlight of 1951, from the point of view of members of the Scottish Rock Garden Club,—and indeed from the point of view of every lover of alpine plants—will be the International Rock Garden Plant Conference which will be held in London and in Edinburgh, from Tuesday, April 24th until Friday, May 4th, and the programme of which is now in the hands of all Club members. This will be the second International Conference on alpine or rock garden plants to be held in Britain during the short history of the S.R.G.C. The first was organised by the Alpine Garden Society in 1936 when our Club was but three years old and our membership in the region of four hundred.

At this Conference discussion centred on such subjects as Rock Gardening in America and in South Africa, the rise of the modern Rock Garden, the utilisation in the Rock Garden of both natural slopes and flat sites, the general cultivation of Rock plants as well as the special culture of particularly difficult subjects, the management of the Alpine House, and of course, the propagation of Alpine plants. And among the outstanding plants exhibited at the Conference Show were *Corydalis cashmeriana*—"the most admired and discussed plant"—*Fritillaria liliacea, Primula Gambeliana, Primula Wigramiana, Omphalogramma vincaeflora* and *Daphne petraea* var. *grandiflora.*

Since 1936 much has happened. In the Club our membership has roughly trebled itself—a remarkable achievement. In the Rock Garden, plants which in 1936 we had begun to hope were fairly well established, were lost during the years of the War when so many gardens were of necessity neglected or else given over to the culture of more essential—albeit more mundane—plants. But these losses have been more than balanced by the new introductions of Mr. Ingwersen, Mr. Seligman, Mr. Davis, Mr. Feidler, the late Dr. Guiseppi, Captain Kingdon Ward—and of especial significance to Scottish Gardens and gardeners, of Mr. Ludlow and Major Sherriff and of their collaborators in the field, particularly Dr. Taylor. From our viewpoint, the years since 1936 have been dominated completely by the untiring efforts of Ludlow and Sherriff to enrich our gardens with hundreds of new or rare—and always beautiful, alpine plants. The success which has attended them will be made abundantly clear during the paper readings, the Shows and the visits to gardens of the two weeks of the Conference.

Quite clearly the time is ripe for a review of the whole Rock Garden field—and thus for a second International Conference. And quite clearly this second Conference could not be entirely under the auspices of the Alpine Garden Society. The S.R.G.C. *had* to play its part. And thus the 1951 Conference will be a "Rock Garden Plant Conference" arranged *jointly* by the A.G.S., and the S.R.G.C. That the two Societies will now, for the first time, unite their forces seems to us an act of considerable significance.

"Pedicularis", in his Alpine Commentary in the 1950 December issue of the A.G.S. Bulletin, wrote thus: "The arrangement to join with the S.R.G.C., in next year's Conference is excellent. We have always regarded the two Societies as complementary to each other and have regretted any suggestions that may have arisen from time to time of minor jealousies. There is unbounded scope for both Societies in their several functions". Jealousies there may have been ; we know not ; but we cannot imagine what cause for jealousy the A.G.S. may have had, comparing, as we must, the records—published and otherwise—of the two Societies during their respective histories. That there *is* unbounded scope for the two Societies "in their several functions" is unquestionable. But what are these several functions? Compare the constitutions of the two Societies. The A.G.S. "is constituted for the purpose of furthering the knowledge of Alpine plants ; to encourage the cultivation of these plants ; to gather and disseminate particulars of their cultivation and conditions under which they grow in nature ; to hold Shows of Alpine plants and to give advice on matters concerning these plants". The S.R.G.C. "is formed to create an interest in Rock Garden plants, to spread a knowledge of such plants ; and to encourage their cultivation. The Club shall hold meetings and exhibitions and carry on such other activities as may promote these purposes".

Obviously "the several functions" of the two Societies are identical. Obviously there *is* scope for both Societies. The two Societies have learned much from each other—and there is still much that each can teach the other. But, because we firmly believe that it is as true with the affairs of Rock Gardens and Alpine plants as with everything else, that the whole *is* greater than the sum of its parts, and that unity *is* strength, we are led to wonder whether in the future it would not be in the best interests of the S.R.G.C. and the A.G.S.—and of rock gardening—if the two Societies were to co-operate in the furtherance of their joint objectives, as they are doing for this brief period of the Conference. We write as members of both Societies, and we are keenly interested in the welfare of both Societies. But our greatest concern is with the ideals they should cherish—the fostering of all knowledge of alpine and rock garden plants.

Be that as it may, the facts are that at the present moment the S.R.G.C. is a more flourishing affair than it has ever been. In recent years it has made very great headway—increased membership and all-round progress possibly in everything save the important matter of its main publication. But there can be no room for any complacency. For we are very conscious indeed that this progress is due in very large measure to the fact of certain outstanding personalities among the Office-Bearers of the Club—factors which will not necessarily always be operative. It is unlikely that the next four years will witness the same influx of new members to the Club as have the last.

In any case, it is very desirable—we would almost say essential—that future members prove themselves more willing to *write* about their plants than the huge majority of our present members. This issue of the Journal is the eighth in the Club's history. It is remarkable that less than forty members have contributed articles and notes to these eight Journals. Remarkable too, that from a membership of nearly twelve hundred, only twelve have contributed towards this present issue; that only three of these are contributing for the first time; that all, save *one*, of the twelve, were *asked* to write. Obviously such a state of affairs cannot long continue, and unless there be a change of temper we view the future of our main publication with not a little disquiet—and certainly not with the optimism of those who have written before us.

Obituary

Mr. ANDREW HARLEY, v.m.h.

Mr. Andrew Harley of Devonhall died on Tuesday, 17th October, 1950 at his home in Kirkcaldy. His death will prove a great loss to British Horticulture and to the wide circle of gardening enthusiasts to whom he gave his generous help and friendship.

The garden at Devonhall, on which he spent so much care, became famous under his ownership not only for the very fine collection of plants he had assembled but also for the successful cultivation of many of the rarer species.

Interested visitors always found a welcome at Devonhall and the Visitors' Book contained many names famous in botanical and horticultural circles both in this country and overseas.

About the time the Devonhall garden was taken over, the great collections of seeds and bulbs were arriving in this country from Western China and Tibet; these soon claimed his attention and many new plants were raised and flowered by him for the first time in Britain.

Mr. Harley was especially interested in Primulas, Gentians, Rhododendrons, Meconopsis and Nomocharis and was the accepted authority on their cultivation.

He was a member of the leading horticultural societies and was President of the Scottish Rock Garden Club in its early days. The award of the Victoria Medal of Honour by the Royal Horticultural Society, a few days before his death, gave tremendous satisfaction to his numerous horticultural friends.

In private life Mr. Harley was a director of the Fife Forge Co., Ltd.

D.W.

Petiolares Primulas in the South

BY D. E. SAUNDERS

THE Editor has asked me to contribute an article on the growing of Petiolares primulas in the South of England. It is with great diffidence that I have acceded to his request and I want to make it plain that I am not presuming to give advice to Northern gardeners but am seeking to show how, even in the vicinity of London, these primulas may be successfully cultivated. It is not possible, of course, to produce plants comparable with the wonderful specimens from the North which are the envy and admiration of all Southern growers, but with care and attention to detail we *can* raise plants which are good enough to give a great deal of pleasure and interest during the dull winter months.

In my experience the Petiolares primulas are very tenacious of life and, given a fair chance, will live for years, but they have certain requirements which are essential for their well-being and it is these which I shall now proceed to consider.

I have arranged these requirements under seven headings and it will be noted that the last section, on pests, takes as much space as the rest put together. This, perhaps, is a reflection of my opinion that the effective control of pests is half the battle in the successful cultivation of these primulas.

1. PROPER PLACING.—A cool, damp atmosphere is absolutely essential to success and of far more importance than any special soil mixture. In gardens which include a piece of woodland, particularly if it is associated with a stream or a pond, this is the place in which to grow the primulas. They will do well in the natural leaf soil, or banks of peat blocks may be constructed for them. I have seen fine specimens growing in such conditions within thirty miles of London. Where suitable sites in the open are lacking, a home for the plants must be sought in the coolest part of the garden, preferably under a hedge to shelter them from direct sunshine and to break the force of the wind. Here they may be either planted out into a bed of prepared soil inside a frame, or grown in pots and plunged in the frame in coarse sand or ashes. Peat is best avoided for the plunging material as it freezes more quickly and thaws less rapidly than either ashes or sand. The plants should be placed well below the level of the frame so that the leaves are not exposed to the wind. If no hedge is available a frame can be erected in a position with a northerly aspect and artificially shaded from the east and west by a palisade of laths or by wicker hurdles or a canopy of hop netting. It is important that the frame be so placed that it can be left open as much as possible since the plants do far better

when they have plenty of light and air. Lights, however, must be provided to keep off heavy or continuous rain and to protect the plants from frost and snow.

2. FREEDOM FROM FROST.—In their native habitat Petiolares primulas are covered all the winter by deep snow which effectively protects their tender leaves and maturing flower buds. In cultivation, therefore, particularly in Southern England, where the onset of winter is often very sudden, they will need protection from severe or continuous frost. The different species vary in their ability to withstand cold, the deciduous kinds like *P. Calderiana* being the hardiest. *PP. sonchifolia* and *bhutanica*, which form resting buds protected by thick scales, are also very hardy, but if the early winter be very mild *P. bhutanica* forms no proper resting bud and may be damaged by a sudden cold spell. *P. Edgworthii*, with its thick farinose leaves, can endure more frost than *bracteosa*, *sessilis* or *gracilipes*, whilst *scapigera*, with me at least, is the tenderest species.

During cold weather I take all possible measures to prevent my plants from getting frozen but in 1947 the cold was so sudden and so severe that the plunge material in the frames froze solid over night, making removal of the plants almost impossible. In the two months continuous frost which followed most of my primulas perished and I had to build up a fresh collection by propagating from the few plants which, by the aid of boiling water and a bayonet, I succeeded in extracting from the frost-bound frames and brought into the dwelling-house. In normal winters, coverings of sacks over the frames and layers of paper over the plants will prevent the pots from being more than superficially and temporarily frozen; provided that they are allowed to thaw out slowly this mild freezing will not hurt them.

On cold evenings my frames are shut down at dusk and covered over with layers of sacks. Should severe cold be expected, sheets of stout paper are placed inside the frames on strands of wire which are attached to the woodwork well above the level of the plants so that they do not get crushed or sodden. Enough sacks are used to cover the frames right to the ground and the hardiest species are placed along the front which, in a sloping frame, is the coldest position. All covers may be safely left on and frames kept shut while the temperature remains below freezing point. The plants will not be harmed by the lack of light and air for they are virtually in a condition of cold storage comparable with that which obtains under snow. Provided they have not become frost-bitten, the return of mild weather will find them looking as fresh as pre-war paint and maybe even unfolding their flowers.

3. SHADING FROM SUNLIGHT.—When the plants can be grown in a position away from direct sunlight or where they get only filtered light for part of the day they will not need shading.

Where, however, the only available north-facing position, such as the back of an alpine house, is enfiladed by morning and evening sun, some form of lateral shading will be required and the frames must be covered with slats during the day. Provided that otherwise the position is reasonably cool the primulas will succeed quite well in these conditions; should the weather be hot enough to cause flagging lights may be put on for a few hours daily and propped slightly open. A fine spraying, morning and evening, helps to keep the plants cool and greatly benefits them. They also appreciate a shower of rain but should not be exposed to continuous wet or the crowns may rot.

4. CORRECT COMPOST.—It is neither possible nor advisable to give exact recipes for soil mixtures since so much depends on the locality of the grower and the nature of the materials at his command. He should however, give his primulas plenty of leaf mould and aim at producing a compost which is open enough to allow free movement of the roots. Stodgy mixtures inhibit root growth and are apt to cause rotting. I find that the addition to the compost of a little old cow manure is much appreciated. A top-dressing, too, of peat and sand encourages the formation of new roots and fosters the growth of the aerial summer roots which often appear an inch or more above ground level and are inclined to die off unless provided with a light rooting medium. A final surfacing with coarse Cornish sand or chicken flint keeps the compost cool and damp and preserves the basal leaves from decay.

5. CAREFUL CULTIVATION.—Primulas need careful watering, the ideal being to keep them comfortably moist but not waterlogged. All dead leaves must be pulled off and a watch kept for dark patches of decay which sometimes appear on healthy leaves in damp weather and may spread all over the plant unless the infected portions are cut out. A light dusting with flowers of sulphur checks mould and is harmless to plants. After flowering has finished it is advisable to remove faded petals or they become mouldy and are apt to infect the pedicels and thus set up decay in the heart of the plant. Seedheads need careful watching as they may turn mouldy or get lost among the foliage which greatly elongates during the summer months. The stems of ripening capsules should be marked with a strand of wool and surrounding leaves be pinned back or cut off.

6. REGULAR REPOTTING.—Healthy primulas make a large root system and need regular repotting to prevent them becoming poor and starved. It also gives an opportunity for division of the crowns and inspection of the roots. The proper time to repot primulas is immediately after flowering, but strong growing kinds may need moving again in the autumn. Unless absolutely necessary they should not be moved between June and September, firstly

because they do not re-establish well in hot weather and secondly on account of their tendency in late summer to undergo a short resting period during which they resent disturbance. However, all sickly plants are best shaken out of their compost, whatever the time of year and started afresh in a cutting mixture of peat and sand after the removal of any decayed portions and a dusting of the wounds with flowers of sulphur and D.D.T. powder to discourage moulds and springtails.

7. PROTECTION FROM PESTS.—The incidence of each pest varies with climate and other local conditions. The order in which I have taken them, except perhaps for the low position given to slugs, is that in which they seem generally to prove troublesome to south country growers.

Red Spider. In hot dry summers, Red Spiders probably cause more damage to primulas than any other pest. Even the common Primrose may lose all its foliage from this cause and examination of dying leaves will show them to be covered, mostly on the undersides, with minute dirty yellow spiders (which are actually not true spiders but mites), all clustered together beneath a thin web. These creatures are smaller and less active than the brightly coloured commoner red spiders which feed on the upper surface of plants such as Androsaces of the Chamaejasme section, Dianthus, Soldanella, etc. Leaves attacked by Red Spider have a bleached and scratched appearance, the bleaching being due to withdrawal of chlorophyll, on which the spiders feed, and the scratching to the coalescing of their feeding punctures. Petiolares primulas are severely attacked by the small type of spider and, unless precautionary measures are taken early in the spring, they may become so numerous that it is impossible to eradicate them. Furthermore, the constant spraying with insecticides may prove as harmful to the foliage as the pests themselves.

A few spiders always overwinter on primula plants, particularly on those in frames, and these form the nucleus of the next season's attack. To destroy these hibernating spiders remedial spraying should be carried out at intervals all the winter and increased in frequency as spring advances. From April onwards, daily syringing with rain water helps to maintain a damp atmosphere and prevent a serious summer outbreak. The preparation "Spidacide" is an excellent control provided it is not used too frequently, when damage to the foliage results. A further disadvantage is its ineffectiveness against aphis. The newer H.E.T.P. destroys aphis equally with red spider and is harmless to foliage. As it is expensive it is more economical to use it alternately with "Spidacide."

Earthworms. Earthworms cause far more damage to plants than is generally supposed, and in gardens where they are numerous they present a serious problem to cultivators of Petiolares primulas.

No primula will flourish for long in a pot containing earthworms for they clog the compost and block the drainage with their casts and also disturb the plant with constant tunnelling. Their habit, too, of sucking and pulling at the roots causes wounds which allow the entry of the injurious fungi and bacteria always present in the soil. These set up decay which, in turn, attracts such pests as millipedes and springtails and other creatures which feed on rotting vegetation. Plants so attacked may finally lose all their underground portions and be reduced to mere stumps surmounted by a few dying leaves. Every effort, therefore, should be made to discourage earthworms. Frequent soaking of the plunge material with strong solutions of potassium permanganate or with Mowrah meal well watered in will bring worms to the surface or destroy them in situ. Composts should be sterilised to kill any small worms or eggs in them, and pots be fitted with worm excluders. Large muscular worms, however, are able to force these up and any worm can crawl into a pot over the side unless prevented by a collar of zinc. In a large collection it is impossible to "collar" every pot, but the rarer ones and those required for showing should be protected in this way. Worms already in pots can be destroyed with Mowrah meal or by soaking the pots, when rather dry, up to their rims for one hour in a solution of corrosive sublimate. Tablets of this chemical can be bought to make a solution of 1 in 2,000 when one tablet is dissolved in one pint of warm water. Since corrosive sublimate is not only a vermicide but also a fungicide, this treatment serves a dual purpose.

Woodlice. Woodlice are the bane of all gardeners on account of their omnivorous habits and vast numbers. They will eat almost any type of plant but are particularly fond of young tissue and therefore very harmful to seedlings and developing shoots. In the primula frames they do much damage by eating out the hearts of the plants—causing them to split up into a number of small crowns—and may destroy all the season's flower buds. Since the flowers are displayed to best advantage on plants with single crowns, this unwanted pruning spoils their appearance as well as weakens them. By far the best deterrent against woodlice is "Shelltox." A thorough spraying of the outsides and insides of the frames and of the plunging material with this preparation will effectively keep them away for several months. The operation should be carried out before the primulas are placed in the frames, but if this is inconvenient then the plants must be well covered with paper to prevent damage to their foliage. Gammexane and 20% D.D.T. powder destroy woodlice and should be scattered about the frames and beneath the pots though these powders are slow acting and the carrier attracts mould.

Vine Weevils. Vine Weevils are becoming an ever increasing pest in the Southern counties, particularly in Surrey, where on any

summer evening dozens of the beetles may be found feeding on primroses and other low growing plants. The larvae, too, are catholic in their taste, devouring the roots of many different plants but being particularly fond of those of primula species. In my own garden, the common primrose and *PP. Juliae, Clarkei,* and *denticulata* are most often attacked although I occasionally find the larvae in pots of Petiolares primulas. Their method of feeding is characteristic for they tunnel their way into the neck of the plant, leaving a hollow shell where they sometimes pupate. Plants so attacked seldom recover. The addition to the compost of Arsenate of Lead (1-2 oz. per bushel) is said to destroy the larvae but until some satisfactory method of controlling the adult beetles be found they will go on spreading from county to county and make the growing of primulas increasingly difficult.

Caterpillars. Caterpillars are betrayed by their frass and by the large amount of foliage they consume. Those which feed exclusively on leaves rarely cause more than temporary damage and disfigurement to plants, and patient search will usually reveal them. Surface larvae, however, such as the Yellow Underwing, Heart and Dart, etc., which eat roots as well as leaves, are serious pests and difficult to discover owing to their nocturnal habits and subterranean mode of life. Caterpillars of this type, known as cutworms, move from plant to plant eating the leaves and gnawing through the stems at ground level. In this way even a single caterpillar will cause widespread damage. Cutworms are found at any time of the year but are most numerous and destructive during August and September. It is difficult to get rid of them in the open ground but those which have invaded pots can easily be destroyed by completely immersing the pots in a bucket of water when the caterpillars will almost immediately come to the surface.

Springtails. Springtails usually follow in the wake of other plant enemies and in this capacity frequently deliver the *coup de grace* to an already wounded or sickly plant. They may, however, concentrate upon a healthy specimen and cause its death by fretting away its crown or stock. Plants, too, which have to be kept close, such as cuttings or recently potted divisions, are particularly liable to attack. Spraying with an oily insecticide destroys any springtails feeding on foliage, and many of those feeding below ground in pots can be removed by standing the pots for several days in a shallow saucer of water which gradually becomes full of them. Crystals of Naphthalene sprinkled on the soil act as a mild deterrent.

Primula Root Aphis. Primula Root Aphis may attack any member of the Primulaceae and no doubt *does* sometimes attack Petiolares primulas, but in my own garden these have so far been spared, although Androsaces, Dionysias and all my European primulas are badly infested. Root aphis is a harmful and often

deadly pest which is most difficult to eradicate. Treatment of the soil with crystals of Para-di-chlor-benzene, which gives off a heavy poisonous vapour, undoubtedly destroys the aphides which come in contact with it, but reinfestation can only be prevented by the continuous use of the chemical which is to be deprecated owing to its toxic effect on the plants themselves. The best method would seem to be occasional application of P.D.B. round the necks and below the drainage of plants that have been, or are likely to be, attacked, and regular repotting when a thorough examination can be made. All infected specimens should be shaken free of soil, their roots washed in methylated spirit and then rinsed in water. This treatment is harmless to the plants provided their foliage is untouched.

Slugs and Green Fly. Slugs and Green Fly have no close season but feed all the year round on primulas in frames unless preventive measures are taken. Slugs can be destroyed by placing small heaps of Corry's Slug Death or Meta and bran round and under the pots; greenfly by regular spraying, during suitable weather, with XLall or H.E.T.P., the latter being safer for plants in flower.

CONCLUSION. In conclusion, I should like to draw attention to two excellent accounts of Petiolares primulas in the Journal of the Scottish Rock Garden Club (No. 6, 1949) and in the Bulletin of the Alpine Garden Society (No. 81, September 1950) by Mr. David Livingstone, illustrated by photographs taken by Mr. D. Wilkie. In these articles Mr. Livingstone describes most of the petiolarid species established in cultivation and points out how lamentably few these are. It is sad that we should possess barely one third of the members of this noble Section and that we are unlikely to obtain many more while political unrest prevails in most of the territories they inhabit.

What is soil pH?

BY H. TOD

THE term "soil pH" has become a commonplace of gardening talk, but, while many have a general idea of what is meant by it, perhaps the majority are at a loss as to its exact meaning and its implications. I have been asked to write an article explaining the "wherefore and the why", and this is an attempt to do so. I do not propose to go into any detail as to the mechanism of ionisation which underlies the concept of pH; suffice it that water breaks down *in itself* into two parts, hydrogen ions and hydroxyl ions, and it is the presence of the free hydrogen ions in excess which gives any solution an acid reaction.

The actual term "pH" is a mathematical convention which has been accepted the world over, as it is a convenient and manageable method of expressing otherwise awkward figures. For instance pH 7 is the conventional way of expressing the fact that in absolutely neutral solutions the concentration of hydrogen ions is 1×10^{-7}, i.e., one part in ten millions, while in a solution at pH 2, the concentration is 1×10^{-2}, i.e., one part in one hundred.

The range of pH in solutions is from 1 to 14, and these figures are disposed in this way

pH	1-2	3-4	5-6	7	8-9	10-11	12-14
Reaction	very acid	strongly acid	acid	neutral	alkaline	strongly alkaline	very alkaline

At low pH figures the hydrogen ion concentration is very much higher than the hydroxyl ion concentration, in the range 3-6 it is greater but getting steadily lower, until at pH 7 the solution is neutral and the concentration of hydrogen ions is equal to that of hydroxyl ions. As the pH scale rises from 7-14, so does the concentration of hydrogen ions fall, and that of the hydroxyl ions rise as the solution becomes more and more strongly alkaline.

The most important points to remember are (*a*) pH 7 represents neutrality, (*b*) figures below (less than) 7 represent the acid side, and (*c*) figures above (greater than) 7 represent the alkaline side.

Now all this, in fact the whole concept of pH, was worked out for solutions of substances in water, and it may not be obvious how this applies to soil. Firstly, it should be pointed out that not the whole range of pH from 1 to 14 is found in soil. For all practical purposes the range of soil pH, for soils likely to be found in this country, is from 4 to 8.5. The extreme of acidity, pH 4, may be found in moorland peats, while the other, pH 8.5, represents a pure chalk soil such as is found in the south of England.

We may then re-write the pH scale for soils as follows—

Soil pH	4-5.5	5.6-6.9	7	7.1-7.9	8-8.5
Reaction	very acid	acid	neutral	alkaline	very alkaline

Soil is a dynamic, not merely an inert substance, and it contains mineral (or inorganic) matter, organic matter, water and air in a state of balance. Some of the mineral content is immediately avail-

able to the plant, and some is in a "locked-up" state, and a similar variation is shown by the organic matter. The whole dynamic balance of soil depends on the presence of water—without which *none* of the nutrients is available, for, in the words of a well-known advertisement, "plants do not eat—they drink".

Plants absorb their nutrients as solutions through the root-hairs —and to a small extent through the leaf-surface, and accordingly the most important item in the soil from the plant's point of view is the "soil solution", which is the water solution of the available nutrients present between and around the actual particles of the soil. It is the acidity or alkalinity of this soil solution which is measured in estimations of soil pH, and to do so, a given quantity of dried soil is mixed with a given quantity of pure water, and the mixture allowed to reach equilibrium. The measurement is then made, and the figure obtained gives a very close approximation to the acidity of the actual soil solution normally present in the moist soil.

For ordinary garden soils the pH range usually is considered best between 6 and 7 ; this is, however, for ordinary border plants, fruit and vegetables. For growing members of the Ericaceae one requires in general a pH below 6 for them to be quite happy, and I personally prefer to have a pH range between 5.5 and 6.5 for any plants, and particularly for alpines and primulas.

The question of "availability" of nutrients is the crucial poin in this whole problem. There may be large quantities of any particular nutrient present in the soil, but if it is not "available" the plant will suffer from a serious deficiency of that nutrient. The best analogy is a starving man outside a locked store of food—all he needs is a key —and a change of pH may be the "key" in the case of the plant. There are, of course, a number of factors other than pH which control the availability of nutrients, and we will consider them in turn.

The whole problem is a complicated one, and as an example we may take the Ericaceae. It is generally stated that they are "calcifuge", i.e., they will not grow in the presence of lime. Now this may, or may not, be the fundamental point. It *may* be lime that is the limiting factor ; lime, or rather calcium, *may* in itself be poisonous to the group ; it may be a question of soil acidity or alkalinity (pH) or it may be the availability or unavailability of some other nutrient which is controlled by the presence or absence of excess of lime.

To explain this latter point, we may consider the case of leguminous plants. These depend for their full health and development on the growth of nodules on their roots. These nodules are caused by, and contain certain micro-organisms which have the ability to

fix the nitrogen of the atmosphere and render it available to the plant which thus, while giving "house-room" to the micro-organisms, gains a free supply of this absolutely essential nutrient.

Now it had been known for a very long time that lime in the soil was of benefit to legumes, but just why was still a puzzle. Recently it has been found that the calcium was needed more by the micro-organisms in the root-nodules, and not so much by the plant. The next discovery was that there were certain soils on which no amount of lime would help legume growth via the root-nodule organisms. On examination and analysis of these soils it was found that they were deficient in another element, Molybdenum, and that it was *this* element that was essential to the organisms. The function of calcium in improving legume growth was next shown to be due to its property of rendering the molybdenum present in the soil more readily available to, or increasing its uptake by, the micro-organisms so that it was an *indirect* as opposed to a *direct* effect on growth.

Conversely, an excess of calcium, for example by over-liming, can cause serious deficiencies of iron, copper, manganese or boron to occur in plants.This may be due to a pure pH effect, the change from acid to alkaline conditions having altered the chemical state in which the nutrient is present in the soil to one in which it is not readily available to the plant. Alternatively, it may be a "blocking" mechanism of some sort, by which the plant is prevented from taking up the required nutrient, even though it is present in full amount, and in an available form. The best-known example of this latter effect is seen with fruit where too heavy dressings of potassium fertilizers, giving an excess of potassium salts in the soil will cause a frank deficiency of magnesium in the plant, even though there is plenty of magnesium salts present in the soil.

Probably the main reason why calcium got the blame for the failure of Ericaceae, gentians and some primulas is that practically all neutral or alkaline soils contain large amounts of lime, either in the form of limestone or chalk, or as finely broken down sea shell as in the "raised beach" areas of sandy soil containing much shell. Obviously there will be a high lime content in these soils, and therefore any alkaline soil, in this country at anyrate, is most likely to be high in calcium on analysis, and thus failures on such soils were automatically blamed on lime.

At the present time we are running an experiment on rhododendrons in which we have started with a mixture of peat with a naturally extremely acid soil which has a very low calcium content. One batch of this mixture has been used "straight", a second brought to neutrality, and third to frank alkalinity (pH 5.3, 7 and 8.4) using an alkali other than calcium carbonate (lime), namely, magnesium carbonate (magnesia). Now an excess of magnesium will in itself depress the uptake of calcium by plants, so what little

calcium *is* present should be still *less* available to the rhododendrons, and it will be interesting to see how they fare in the neutral and alkaline soils. This work will be reported in due course when results are obtained.

This effect of magnesium in decreasing the calcium uptake of plants is most probably the explanation of a technique which is used to rescue gentians, etc., which are going yellow, i.e., showing the typical chlorotic response to an "excess of lime". Whether the effect is a true lime toxicity or an upset of some other nutrient, the magnesium effect on the calcium would probably have the same final result. The plant is watered heavily with a weak solution of Epsom Salts (magnesium sulphate) at a strength of about 1 oz. to 2½ gallons of water. According to Hills in "The Propagation of Alpines", this "has saved many a yellowing gentian" and this may also link up with the use of the same solution to promote flowering in *Lithospermum diffusum.* These are two further points which we are investigating—again results will be reported later if and when they are obtained.

One further problem which arises when working at very low or very high pH values, i.e., in very acid or very alkaline soils, is the difficulty of ensuring that plants in such soils get an adequate supply of phosphate. This is due to the well-known trouble of "phosphate fixation". In very acid soils there is usually a large amount of iron and aluminium salts in a soluble and reactive state, and these combine with the phosphate to give the insoluble phosphates of these metals, compounds which are quite unavailable to the plant. The other extreme, of high alkalinity, leads to the formation of insoluble tri-calcium phosphate which is, again, not available to the plant.

As will be seen from this short account, there is a lot yet to be learned about the relationships occurring between various nutrients in the soil and the plants growing therein. Much is known about these matters in relation to agricultural crops, vegetables and fruit, but comparatively little about the relationships to garden plants, and least of all to those which interest us most, namely alpines, rhododrendrons and the Ericaceae generally, gentians, primulas and the Liliaceae. I hope that in the years to come we may be able to clear up some of these questions, and thus be enabled to grow various plants better, and even, perhaps, to grow some that now seem to be in the category of "impossible in cultivation".

In my Alpine House

BY K. C. CORSAR

I DO not propose to embark upon a description of my Alpine house. Rather will I confine myself to some notes on a few of its inhabitants. My Alpine house plants are not grown in pots or pans as is usual for such plants, but are planted out, and this method of cultivation has, on the whole, proved a success. Almost all the plants that I have put in have done well; and in spite of the fact that the glass roof of the house is some feet above the soil, only one or two of my plants have been so "drawn" as to have become out of character. Of course, like every other gardener, I have had failures. *Draba polytricha* simply will not grow for me, though it is not generally considered a difficult subject. *Weldenia candida* I have tried twice, but both plants died within a few months of their arrival. One or two of the European Primulas have not looked too happy, and in their case I have been forced to return to pot cultivation.

Erinacea Anthyllis, probably still better known as *E. pungens* though the name was altered some years ago, is the Hedgehog Broom of Southern Europe where it inhabits dry, sun-baked uplands. It is more at home in its present situation than ever it was in the pot in which I grew it for some years. Its rate of growth has increased rapidly and it has flowered profusely. In my previous garden I had a plant of *E. Anthyllis* of similar age to my pot plant, growing in the open rock garden, but even though it was given one of the sunniest positions available it never flowered so well, and for several years did not flower at all. It would thus appear that this shrub demands a real baking if it is to give of its best, for which reason, and so far as Scotland is concerned, the Alpine house is the proper place for it. Not by any means common in cultivation, this plant is not only a slow grower but is loathe to flower until it is several years old and has really become established. Thereafter a few seeds will be produced, and these will normally germinate without difficulty.

Eritrichium strictum does not present any of the cultural difficulties associated with *E. nanum*, and is, in fact, a comparatively easy plant to grow. In the open rock garden it will require protection during the winter months, and even then may give trouble, but growing in a scree mixture in my Alpine house it thrives and flowers as well as could be expected of any plant. During the winter, when all the foliage has withered and shrivelled up, the plants present a dejected appearance, looking as if they were completely dead. But

towards the end of April fresh growth appears, the dried up leaves are thrown off, and in a few weeks the plants look as fresh as ever again. Gardeners must therefore not give up hope even when their *Eritrichium* appears to have gone for ever. I do not remove the dead foliage but permit it to drop off naturally. The seed I allow to fall and it germinates readily in the scree. Seedlings are lifted in the early summer and pricked off singly into small pots where they can be grown on until large enough to plant out. With me the flowering time of *E. strictum* is August, and the appearance of the lovely blue flowers at a time when there is little else in bloom in my Alpine house is therefore all the more appreciated.

Flowering at the same time as *E. strictum* is *Statice* (or *Limonium*) *cosyrensis*, a South European shrub-like plant of which I am particularly fond. This is in my experience one of the most free-flowering of rock garden plants. I have grown it for many years now, and though particular plants die in the normal process of nature, I have never lacked replacements, for innumerable self-sown seedlings have invariably appeared. *S. cosyrensis* forms a compact and shapely dome of dark green little leaves, which is completely hidden by the multitude of flower stems produced in late summer. It is seldom that this species is seen in gardens. Why this should be so it is difficult to say for it is a grand rock garden plant and its name deserves to be known more widely.

Edraianthus serpyllifolius var. *major*, frequently listed as *Wahlenbergia serpyllifolia major*, has, for its size, the largest flowers of any rock garden plant, and a well established clump in a scree is a sight worth seeing. I had grown this species out of doors for a number of years and had never failed to flower it. More recently I decided to plant it in the Alpine house and here it has done even better. *Edraianthus serpyllifolius* should be included in every collection of good rock garden plants. The only possible objections to this very lovely plant are that its flowering season is short and that for some time after flowering it looks rather untidy by reason of the dying back of the older growths. I cannot speak of it as a pan plant because I have never grown it thus, but there would appear to be no reason why young specimens at least should not be treated in this way.

Among the half dozen or so species of *Lewisia* which I grow, *Lewisia Howellii* is an alpine from the States of California and Oregon. Some authorities deny specific rank to this plant and place it as a variety of *L. Cotyledon* but the plants which I have differ so markedly from *L. Cotyledon* that it is hard to think of one being but a variety of the other. My plants were grown from seed sent to me fifteen years ago from the United States, and the largest of them now measures nine inches across. The first ten years of their lives were spent in pots where they did well enough, though never so

well as they have done in my present Alpine house. Probably no pot made is deep enough to accommodate the long tap roots which are characteristic of this species. I had a colony from the same source in my former rock garden, where, growing in sunny crevices, they produced a few flower spikes annually. Unfortunately however the inflorescence was frequently damaged by rain and wind.

Close to the last named grows a member of a different section of the genus Lewisia—*L. Tweedyi*—a specimen which also numbers fifteen years. Though this species has the reputation of being difficult I have never found it so and I have more than one plant of considerable age. As a pot plant, *L. Tweedyi* will never do so well as it does in the deep soil of my Alpine house, for not only does it produce its lovely flowers over a long period of the summer and early autumn, but self sows its seeds around the parent plant. I have lifted and potted up quite a number of self-sown seedlings, and provided they are shifted at an early age, they will grown on without a check.

I must, of course, mention Primulas. *P. Rockii* is not at all a common species—in fact it might be classed as very rare in gardens—though it has been in continuous cultivation since 1935. I have never attempted, nor seen anybody else attempt, to grow *P. Rockii* in the open garden, and I rather imagine that it would demand the protection of an Alpine house or a frame. In its present situation growing in a rich open soil mixture, it clearly does well with me as the photo (fig. 25) amply testifies. In some respects this Primula bears a resemblance to a small form of *P. Forrestii* but the colour is I think, better, and the plant is neater in every way. I have not yet succeeded in securing seed from my plant, in spite of the quantity of flowers which it produces, but I believe that seed *is* occasionally produced and I hopefully look for seedlings near the old plant.

P. Ellisiae, a North American species of the Parryi section, has never failed me since it was planted in the Alpine house—in fact one plant I have has developed into a considerable clump. Over a period of months, from February to September, it produces a succession of flower-heads and in so far as my experience goes this is the most satisfactory of the Parryi Primulas. I have *P. Parryi* itself, but it does not flower so well. Now I am trying *P. Cusickiana*—reputed to be very difficult to manage—and *P. Brodheadae*, sometimes considered to be a variety of *P. angustifolia*, of both of which I recently received plants from the United States. But though these latter species are interesting, I very much doubt if either will excel *P. Ellisiae* as a rock garden plant for this country.

Lithospermum oleaefolium is best confined to the Alpine house, in Scotland at any rate, though in the milder south it may be grown out of doors in a sunny, sheltered situation. A well shaped bush of this dwarf shrub, covered with its sky-blue flowers, is a lovely sight,

albeit an uncommon one for this Lithospermum is as yet comparatively rare in our gardens. Unlike the other members of the genus, *L. oleaefolium* is tolerant of lime and, in fact, is sometimes said to require it. My plant however grows quite happily in a soil completely devoid of lime. Good drainage is absolutely essential for anything like stagnant moisture in the soil will be death to the plant. I proved this myself some years ago ; then I had a rather nice little specimen growing in a four inch pot ; the drainage got silted up ; the plant shed its leaves ; and that was the end of it. But planted at the scree end of my Alpine house, fully exposed to the sun, *L. oleaefolium* is in a situation well to its liking.

It would not be possible to tell of all the plants which grow in my house, but to show that there is a wide variety I will mention just one more, *Gentiana angulosa*, generally listed as a variety of the popular *G. verna*. This is a stronger plant than *G. verna*, and with me more compact, and consequently, to my mind, more satisfactory. The colour of *G. angulosa* may vary somewhat, there being lighter and darker forms ; my large plant has fine bright blue flowers, in every way the equal of *G. verna* at its best. *G. angulosa* is in my opinion one of the very best of the spring-flowering Gentians. Near by *G. angulosa* grow others of the same genus, dwarf Rhododendrons, Cassiopes, and moisture loving Primulas which flower in the early part of the year. The result, when all are at their zenith is really gratifying. But above all, every plant looks happy.

A few Hints on Showing Rock Plants

BY A. WALMSLEY

ONE often hears the remark "Oh, but I couldn't show; I haven't got an Alpine house." It is mainly with the object of dispelling this idea that these notes are written, by one who grows most of his plants in the open and pots them up when required for showing. Classes in the Show Schedules are generally for one or more Pans but, as will be seen from the Show Notes and Rules (see Year Book), the term Pan means Pot or Pan. The possession of pans is not therefore essential, but they are more suitable for the many rock plants which have a shallow but spreading root system. Better still, if you can get them, are the half pots which have the width of a pan but in depth are between the pan and the pot of the same size. One of the Rules for Judges says that no distinction shall be made between a plant grown in a pot or pan and one lifted from the open ground. But can one do this without considerable risk of losing the plant? The writer, having done it successfully hundreds of times, has no hesitation in answering, Yes. But care must be taken, and it is hoped that the following tips from personal experience will prove helpful.

Plants with compact fibrous roots such as the dwarf Rhododendrons, will lift with much less risk than those with tap roots such as the Daphnes and Aethionemas. You need not decide in which classes you are going to show until 10 days beforehand, as entries have only to be received a week in advance. By this time you should have a good idea as to which plants will be in flower and it is only necessary to know for what class or classes each is eligible. The Show Notes, and some of the Nurserymen's catalogues, will help you to determine this. You may still have some choice, as for instance between several Saxifrages or several Primulas where you have entered only one of each. The next point to decide is when to pot up your plants. If the weather is bright a plant which is in flower a week before the Show would be better potted up then and kept in the shade. On the other hand a backward one, particularly if growing in a sunny place, might be better left until the last few days. Although the writer has often done it successfully he does not advise potting up a plant less than two days before the Show, because if there is much root disturbance it may flag temporarily.

Having decided that the time has now arrived to pot up a certain plant the following procedure should be adopted. First lift your plant with plenty of soil, using a fork rather than a spade or trowel, and carry it into a cool potting shed. You must then determine the most suitable size of pot or pan which will contain all the

roots without allowing the plant to have an over-potted appearance. Having decided on your pot, first see that it is washed or scrubbed clean both inside and outside. Then put in a little drainage material —very little is needed since this is only a temporary home—and cover this with moss or leaves. Sphagnum moss is much the best if you have it, because it holds the moisture. Now shake off some of the soil, if necessary, and pot your plant firmly and to the same depth that it was growing, but the top of the soil should be slightly below the rim of the pot. This is to allow room for a top dressing of chips or other material. Chips are most generally used as they help to conserve the moisture as well as set off the plant on the show bench. They may be of any stone which is available, but limestone ought not to be used for lime hating plants such as the Ericaceae. Moss makes a very effective covering for the moisture loving plants such as some of the Primulas. Having potted and top dressed your plant, stand it in water until the top dressing shows moist; then place it in the shade for at least one day. If potted up a week before required it may want a further soaking if subsequently put under glass to bring it on, because you will not be allowed to water it during the Show. All that is now necessary is to insert in the pot a neat label on which is clearly written the name of the plant. Every endeavour should be made to ensure that the name is correct, but mistakes will not by themselves mean disqualification. It usually improves the appearance of a plant to cut off the flowers, leaves or twigs, which have died. Some flowers of bulbous species, such as tulip or narcissus, may require small stakes for safe travelling but it is better to dispense with these, if possible, on the show bench. Finally, take with you to the Show a small bag of the top dressing you are using in case any gets spilled on the journey.

When your plant is home again give it a soak, if necessary, and replant the following day. If the weather is dry it is a good plan to fill the hole, in which you intend to replant, with water, and let this first drain away. It may be advisable in very warm weather to shade the plant, and see that it does not get too dry for the next week or two. If these precautions are taken it should be a very rare experience to lose a plant which has been potted up for a Show. The fact that one is an exhibitor, in however small a way, makes a Show much more interesting. Added to this is the very good chance of winning one or more prize vouchers, which can be exchanged for more and better plants. Let no one be deterred from showing plants because they haven't got an Alpine house, perhaps not even a frame, which is almost as good. The writer won the George Forrest medal the first time he exhibited, with a plant potted up from the open. You may be just as lucky.

Astilbes for the Rock Garden

BY A. L. WINNING

MOST rock gardens have shaded corners or low lying pockets kept moist at all times of the year by their position or aspect. From experiences in an area of 35-40 inches of rainfall per annum, and where heavy loams and clay soils predominate, I can recommend the miniature Goats Beard and allied plants in the Saxifragaceae as worthwhile and durable plants in such circumstances.

The dwarf Astilbes present no difficulties in loamy soils, and more sandy soil conditions can be ameliorated by the addition of leaf mould or peat, this being worked into the surface. Shade—and this can be provided by the careful association with shrubs—is appreciated at all times and a north aspect can be utilised. Once stock is obtained division can be practised to provide any additional numbers for the small rock garden.

The following forms do well here (Kilmarnock), flowering through the Summer and early Autumn. *Astilbe glaberrima* var. *saxatilis* (sometimes catalogued *A. glaberrima* var. *saxosa*) is a choice little woodland plant from Japan. The fluffy pale pinkish-white inflorescences, 2-4 inches high and borne during July and August, are composed of small flowers with distinct red anthers and are displayed against a softening background of dark green dissected fern-like foliage. This plant has a daintiness hardly equalled by its more robust relatives. It appreciates a more gritty soil than the rest and a shaded spot in a scree is the ideal situation ; if desired it is also suited to pan culture.

Astilbe simplicifolia has glossy palmatifid leaves which colour beautifully in the autumn when they somewhat resemble those of the popular wall climber *Ampelopsis Vietchii*. This Astilbe, according to one authority, reached this country accidentally, being present in a clump of a Schizocodon introduced from Japan. When planted in groups it is very colourful from July to September. The pinkish-white flowers form rather denser and taller spires than the first mentioned species. From *A. simplicifolia* two groups of hybrids of some importance have been derived. The *A. crispa* hybrids are characterised by curled and crinkly foliage and short spikes not usually more than 6-9 inches high. Among named forms with distinct colour can be mentioned "Perks"—a rosy pink, and "Gnome"—a pale pink. This latter type presents a stiff appearance and resembles the popular modern hybrid Astilbes in miniature.

Astilbe simplicifolia var. *rosea* (sometimes catalogued *A. simplicifolia hybrida rosea*) is a taller hybrid. The leaves are com-

pound and the influence of the possible parentage of *A. hybrida* can be seen in the foliage and flowers. The pink flowers are produced in arching sprays 12-14 inches high, from June till August.

Perhaps *A. chinensis* var. *pumila* is best remembered for its easiness of culture and lateness to flower. Stout well-clothed spikes 12-15 inches high are covered with rose flowers which develop mauve tints with age. This species is certainly most tolerant of heavy soil. Though not objectionably invasive it can spread by suckers arising from the central rootstock. It flowers from August till September when colour in the garden is becoming less plentiful. Along with *A. simplicifolia* var. *rosea*, this plant can be grouped as marginal plantings to the pond or can be used for the front of the herbaceous border.

Spiraea digitata var. *nana* is closely related to the Astilbes, and like these plants enjoys a cool root-run and some shade. This plant can be considered a miniature form of *S. palmata* (syn. *S. lobata*). The flowers are rose-cerise, on 6-9 inch stems, and the flowering period extends from July to September.

All the above require little annual attention other than the removal of spent blooms. Mulching with peat or leaf mould in early spring will maintain a healthy colony which need only be divided when the clumps become overgrown, after a few years of growth.

Propagation by division is done when growth commences in April. The stout rootstock can be sliced with an old knife or two small hand forks placed back to back. The divisions are best run out in a leafy mixture in a sheltered partly shaded bed. Generally, root-run is restricted by pot culture which can only be recommended for *A. glaberrima* var. *saxatilis*, and then only when very small pieces are being utilised.

Where large numbers are wanted seed can be used, though named forms of *A. crispa* require vegetative propagation to maintain a true stock. Seed does not always set (e.g., *A. glaberrima* var *saxatilis*), but when it does set it is necessary to ensure that the capsules are fully ripened before the spikes are cut. The seed is very fine and sieving should be directed at removing the maximum amount of chaff.

Sowing in John Innes Seed Compost can be done in the early winter followed by freezing and germination in a cool house. Another method is to sow the seed in early spring under glass. Thin sowing, with a slight covering, is sufficient to provide suitable conditions for germination. After pricking off, the seedlings can be run out in the manner carried out for the divisions.

Ludlow and Sherriff Air Mail Plants

The Record of the behaviour (up to Sept., 1950) of the Ludlow and Sherriff plants flown to Britain from Bhutan by Major Sherriff and Mr. Ludlow in November 1949 and distributed by Dr. George Taylor to:—

(1) Lord Aberconway.
(2) Mr. R. B. Cooke, Corbridge.
(3) Mrs. Crewdson, Kendal.
(4) Major and Mrs. Knox Finlay, Methven.
(5) Mr. and Mrs. J. T. Renton, Perth.
(6) R.H.S. Gardens, Wisley.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
16356	Paraquilegia anemonoides	1	Good condition	No	Three healthy plants	
		3	Dry	No	Healthy and well	It arrived looking absolutely lifeless but recovered and had the most beautiful foliage, that is now (Sept. 23rd) beginning to die down again.
		4	2 very dry dormant plants	No	Very good	Potted on arrival and broke early into growth in cold house. Both plants died back in Spring due to frost or out-of-season growth but broke away again and were later planted out, one in peat garden, and one in rock garden.
		5	Poor and dry Roots broken	No	Good	Is now growing in pots.

Collectors' No.	Name		Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
16704	Meconopsis Sherriffii	1	Good condition	No	Healthy	
		2	Good	No	Healthy	Two plants potted in soil about ⅓ grit and about ⅓ leafmould and loam. Kept in an airy partly shaded cold frame all Summer. One plant put up a bud which went blind. Attacks by green-fly to be guarded against.
		3	Very dry	No	One plant very healthy	Potted. Came very early into growth in cold house, with delicate foliage. Repotted in April 1950 and showed improved condition. Planted out in June 1950 and now looks well.
17022	Anthogonium gracile	2	Fair	No	Healthy	Kept in cold frame and house.
17198	Aconitum (new species)	1	Good condition	No	Two healthy plants	
		3	Dry	Yes. May 22	Not too happy	I divided it and am not sure if it will survive. It definitely did not like being divided after flowering.
		4	One dormant clump	Yes. 6-7 flowers; seed harvested	Very good. A lovely plant.	Planted out directly in peat garden. Covered with windolite in late Spring when growth appeared but this was probably not necessary.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
17203	Aconitum sp.	2	Shrivelled	No	Dead	Potted without starting to grow.
17204	Aconitum pulchellum	1	Good condition	No	Healthy	
		5	Good	No	Growing well	
17206	Primula elongata	4	One dormant plant	Yes	Good	Planted directly in peat garden, flowering early and out-of-season. Should flower well next year.
17224	Aconitum sp.	2	Shrivelled	No	Dead	Potted without starting to grow.
17276	Notholirion macrophyllum	2	Good	Yes	Healthy	Grown well in box and pot.
17362	Nomocharis nana	2	Poor	No	Dead	Made no attempt to grow.
17429	Lloydia longiscapa	2	Fair	No	Doubtfully alive	Not done well. Retained in a pot.
17444	Primula tenella	2	Good	Yes	Healthy	Half of clump potted and half planted in a box. Grown well in both cases and flowered off and on for weeks. In late summer some were divided and planted outside. These healthy looking so far.
		3	Good	No	Healthy	After arrival died down but now looking well.

Collector's No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
		4	One small dry clump	Yes	Very good	Potted and put in cold house. Flowered May 1950. Shown at Chelsea 1950 and received Preliminary Commendation. Mr. Ingwerson spoke to me about this plant and said "send it down again when it shows more flower". In July 1950 it was covered with flowers and was therefore sent to the show on 11th July, 1950. I was told that the Committee considered that a full year of growth should be evident before an Award of Merit could be made.
		5	Dormant	Yes	Good	Exhibited in flower at the Scottish Rock Garden Club Show in Perth, 3/5/50.
17529	Lilium giganteum	2	Fair	No	Doubtfully alive	Started in pots, then planted out. Leaves eaten by slugs and probably by young rabbit.
17556	Orchid	1	Good condition	Yes. March	Healthy	
19070	Nomocharis nana	2	Poor	No	Dead	Made no attempt to grow.
19123	Cypripedium tibeticum	4	One very dry dormant clump	No	Fair	Planted directly into the peat garden. In early spring some young growth appeared and was covered with a sheet of windolite but young growth was damaged by the late April frosts and cold winds although still protected. The clump was moved later to a more sheltered and damper situation, and the secondary growth is now quite good.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
19128	Primula umbratilis	2	Good	Yes	Healthy	All potted and kept in cold house all summer. A dainty plant when in bloom.
19146	Diapensia himalaica	2	Too dry	No	Dead	A large plant which went brown and died despite being well soaked on arrival.
19167	Primula tenuiloba	2	Good	No	Dead ?	Clump potted and only made weakly growth. It appears now to be dead.
19226	Primula Caveana	5	In full growth	No	One plant survives	
19235	Sorbus microphylla var. poteriifolia	6	Poor. Very dry A mass of larvae of St. Marks Fly in the packing material	No	Now growing well	
19292	Notholirion hyacinthinum	2	Good	No	Fair	All planted out after starting in a box.
		3		No	Still alive	
19309	Androsace sp.	6	Very dry and dead	No		A few seedlings have been raised from seeds taken from the dead plant.
19330	Primula Waddellii	1	Good condition	No	Healthy	
19352	Lloydia serotina	2	Fair	No	Doubtfully alive	The plant put up a few weak leaves which did not last long. Kept in pot.
19366	Androsace Hookeriana	6	Very dry	No	Growing well	Seedlings have been raised from ripe seeds found on the plants.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
19375	Primula Waddellii	4	Two dry clumps	One bloom August 1950	Good	Both clumps potted and these are still in pots in cold house. One plant in one pan is now about to produce one large bloom (15/8/50).
19404	Androsace sp.	5	Very dry with broken tap root	No	Dead	
19420	Primula soldanelloides	5	Good dormant condition	No	Good	Split up and growing in pots.
19490	Lilium Sherriffae	2	Good	No	Fair	Retained in pots. Rather weakly growth.
		3		No	Still alive	
19497	Spathoglottis ixioides	2	Fair	No	Doubtfully alive	In pot. As yet no sign of growth.
19498	Notholirion macrophyllum	2	Good	Yes	Healthy	Grown well in box and pot.
19544	Thalictrum Chelidonii	6	Very dry	Yes. May 1950		Two healthy plants in stock.
19574	Primula flagellaris	5	Good	No	Growing very well in pots	

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
19610	Primula Griffithii	4	Five large winter buds in good condition	Yes, all have flowered	Very good	Three planted direct into the peat garden and covered with windolite cloche. Two potted and placed in cold house. One plant lifted from peat garden and sent to A.G.S. Show, March 1950 where it received only a preliminary certificate. This plant was in perfect condition for showing as the enormous winter bud was still in full evidence and the colour of the flower was finer than those of the potted plants which were no more forward in growth.
19611	Primula Griffithii	1	Good condition	Yes. April 1950	Healthy	Two offsets have been obtained from the one plant received.
19620	Codonopsis sp. nov.?	3		Yes	Fine	A lovely sight climbing up a 10 ft. wall, and covered with blue flowers. Sept. 23, 1950
		5	Dormant. Good	Yes	Excellent	Potted up. Grew well. Now a climber of 6 ft. Flowering beautifully 20/8/50. Quite the best Codonopsis we have seen.
19674	Codonopsis sp.	2	Good	Yes	Healthy	In pot. Flowered very well and now setting seed. A very fine Codonopsis.
		3	Good	No	Still alive	
19710	Aconitum (new spec.)	2	Poor	No	Dead	Made no attempt to grow.

Fig. 25. PRIMULA ROCKII (*see p.* 96) (*Photo., D. Wilkie*

Fig. 26. PRIMULA WADDELLII (*see p.* 119) (*Photo., G. Sherriff*

Fig. 27. PHYLLODOCE ALEUTICA (*see p.* 129) (*Photo., R. B. G., Edinburgh*

Fig. 28. DIAPENSIA HIMALAICA (*see p.* 119) (*Photo., G. Sherriff*

(*Photo., G. Sherriff*

Fig. 30. LLOYDIA LONGISCAPA (*see p.* 119)

(*Photo., G. Sherriff*

Fig. 29. PRIMULA SOLDANELLOIDES (*see p.* 120)

Fig. 31. STREPTOPUS SIMPLEX (*see p.* 122) (*Photo., G. Sherriff*

Fig. 32. CODONOPSIS CONVOLVULACEA (*see p.* 120) (*Photo., G. Sherriff*

Collector's No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
19712	Primula macrophylla	4	Two dormant plants	Yes	Very good	One plant placed straight into the peat garden. The other potted and planted out after flowering. Both have set seed. The potted plant was shown at the Scottish Rock Garden Club Show, Edinburgh, May 1950.
19716	Allardia glabra	2	Good	No	Healthy	Kept in a pot until late summer. Made rather straggly growth. Now out of doors in a scree mixture and making more sturdy growth.
19721	Gentiana amoena	2	Poor	No	Dead	Died after making a weak attempt to grow.
19727	Aconitum sp.	2	Poor	No	Dead	Made no attempt to grow.
19750	Primula macrophylla	1	Good	Yes. April	Fairly healthy	Seeds obtained.
		2	Good	No	Some healthy, some dead	A large clump which had started into growth on arrival, was broken up and each crown potted separately. In Spring some planted out in moist ground. Those in very wet plaees (and it was wetter than expected in the summer of 1950) have mostly died. Those in better drained ground have grown well. A few which were kept in pots have mostly died.
19757	Primula strumosa	1	Good condition	One plant flowered	Healthy	

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
19764	Aster sp.	6	Very dry	No	Growing well	
19766	Primula Caveana	1	Good	Yes	Very Healthy	Seeds obtained.
19768*a*	Primula strumosa x P. Calderiana	4	Dry and dormant	No	Very good	Planted direct into peat garden.
19768*b*	Primula strumosa x P. Calderiana	4	Dry and dormant	No	Very good	Potted, but planted in peat garden May 1950.
19768*c*	Primula strumosa x P. Calderiana	4	Dry and dormant	Yes	Very good	Potted. Flowered may 1950. Very fine white with yellow eye surrounded with brown edge. Now planted out. No seed set.
19771	Aconitum (new spec.)	2	Good	Yes	Some have died, others seem all right	All potted and kept in cold house. Up to mid-summer grew and flowered well. Then some died of heart-rot. Others, kept drier seem to be going to rest satisfactorily. A fine dwarf Monkshood.
19777	Primula Jonarduni	4	Dry clump	No	No sign of life	Potted and put in cold house. The clump was full of other vegetation. I think that *P. Jonarduni* did break away on one side of the clump during early Spring. If that be so, then I killed it by not watering enough.
19804	Primula pusilla	5	Dormant. Good	Yes. May	Excellent	Exhibited in Edinburgh at Scottish Rock Garden Club Show, 2/5/50. Split up and growing well in pots.
19831	Lilium nepalensis	2	Good	Yes	Healthy	Kept in pot. Fine flower, and large for the size of the plant.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
		3	Good	Yes	Still alive	
19832	Primula umbratilis var. alba	1	Good	Yes. March	Healthy	Likely to be a little tender.
		2	Good	Yes	Healthy	Potted and put in cold house. Started to grow almost at once and in full flower before the end of February. Leaves all lost by June. Fresh leaves produced in July and these still green in the middle of October. A fine Primula.
19835	Primula tsariensis var. alba	2	Good	Yes	Healthy	All have been kept in pots and have grown well. Flowered August-September 1950. Flowers attractive and one instead of being white was flushed with orange. Should be a fine addition to the Petiolare Section.
		4	Dormant. Sufficeint material to make three plants	Yes. 1 plant	Good	One plant planted in the peat garden has flowered. Major Sherriff saw it when in flower and said that it might be a *P. strumosa* hybrid. The two plants grown in pots did not do so well and have now been planted out (17/8/50)
19836	Sent as Primula geranifolia but turned out to be P. uniflora	5	Poor and weak	No	2 plants flourishing	

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
19837	Sent as Primula umbratilis var. alba but proved to be P. tsariensis var. alba	5	Good	No	Excellent	The plants have grown well and have been planted outside.
19842	Primula tsariensis	1	Good condition	Yes. March	Healthy	
19846	Lilium Wallichianum	2	Fair	No	Healthy	Kept in pot.
		3		No	Alive and well	
19852	Lilium giganteum	2	Fair	No	Doubtfully alive	Started in pots, then planted out. Leaves eaten by slugs and probably by young rabbit.
19856	Primula sp. (section Petiolares)	4	A perfect clump of 3 dormant buds with fresh foliage and offshoots	Yes	Grand. Divided and planted out May 1950	Potted on arrival and placed in cold house. Shown A.G.S. Show March 1950 in lovely flower as probably a new species and as such received a preliminary certificate. We divided the plant in May into four parts and planted them in a shaded part of the peat garden. The divisions were covered with pots for a short period. They now appear to be in good condition. No seed was set
20843	Lilium nepalense var. concolor	2	Good	No	Healthy	Retained in pot.
20896	Lilium Wallichianum	2	Fair	No	Healthy	Retained in pot.

Collector's No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
20902	Omphalogramma Elwesiana	4	One dry dormant clump	Yes	Very good	Planted directly on arrival in peat garden and covered with sheet of windolite in early Spring. Photographed by Major Sherriff when it was showing many flowers. Four large seed pods harvested.
20956	Notholirion hyacinthinum	2	Good	No	Fair	All planted out after starting in a box.
21015	Primula nepalensis	4	Five dry plants	No	Very good	Three planted directly out in peat garden and two potted. One of the potted plants planted out in May 1950. The other planted out June 1950.
21038	Primula Normaniana	2	Good	No	Healthy	First planted in box and put in cold frame, then in Spring all planted out in shady bed. All have grown quite well.
21044	Streptopus simplex	1	Good condition	No	Two Healthy plants	
21065	Primula Dickieana	2	Good	Yes	Dead	Planted in box and kept in cold frame. Some transferred to a pan and sent to the Chelsea Show. These all died on their return and the others in the box died later. Heart rot was the trouble in all cases.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
21147	Primula vernicosa	2	Good	Yes	Healthy	On arrival all potted up separately as they had started to grow. Later, about half the plants placed outside in shady beds. All have grown well.
21152	Diplarche multiflora	2	Too dry	No	Dead	Soaked in pail of water on arrival but the leaves all fell off and the plant died.
		5	Completely dried out	No	Dead	
21172	Primula macrophylla var. macrocarpa	1	Good condition	one plant flowered	Healthy	
21178	Primula Wattii	2	Good	No	Healthy	All plants potted up and kept in the cold house.
		3	Healthy	No	Healthy	These plants did not like being in pots. They are now planted in the peat wall and look very well.
		4	A dry clump	Yes, but to no great extent	Very good	Potted on arrival ; divided in Spring and some planted in the peat garden. Part of clump repotted died back and now, August 1950, making winter crowns.
		5	Good dormant condition	Flowered in May	Healthy	Good dark colour form. Flowers large. Split up and growing well.

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
21185	Primula Jonarduni	1	Bad condition Too wet	No	One plant surviving	
		2	Too dry	No	Dead	Never attempted to grow.
		3	looked dead and lifeless	No		Planted in peat and leaf-mould ; recovered a little. A quantity of seedlings appeared round the old plant. But slugs evidently adore this plant and I have lost nearly all the seedlings.
		6	Dry and dead			
21187	Primula Jigmediana	2	Good	No	Some dead and the rest weakly	Clump kept in box in cold frame till July. Then each plant pricked out separately into another box. Most of these died and the few left are not strong.
		5	Dormant. Good	Yes. 2/5/50	Fine	Flowered and exhibited at the Edinburgh Scottish Rock Garden Club Show, 2/5/50. now split up and growing well.
21192	Lloydia longiscapa	2	Fair	No	Dead ?	In pot. Did not come up.
21197	Primula soldanelloides	1	Good	Yes. March 1950	Healthy	

Collectors' No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
		4	One dry clump	No	Very good	Potted on arrival. The clump was full of other vegetation, and required much care as regards watering, etc. The pan looks well though there has been no signs of flowering. I feel that I should divide it and may do so now and should have done so at an earlier date.
21199	Nomocharis nana	2	Poor	No	Dead	Made no attempt to grow.
21210	Primula tenuiloba	4	One dormant plant	No	Quite good	Potted. Still in cold house.
21214	Primula vernicosa	4	Dry clump sufficient to divide	No	Very good	Four divisions planted direct in peat garden. One division potted on and retained in cold house.
21218	Primula bhutanica	1	Good	No	Healthy	
21219	Primula bracteosa	5	Showing slight growth	No	Growing very well outside	
21230	Primula xanthopa	4	Dry material sufficient to make two pans	Yes. Both flowered well	Very good	A primula with lovely foliage. Both pans kept in cold house. One pan came into flower in March and then flowered fully in July. Sent to the R.H.S. Show, 11th July, 1950 and received a preliminary certificate. The plant was in perfect condition. The other pan was and is equally good but was divided earlier and a portion has been planted out in a scree in the Rock Garden. Condition of these now fair.

Collector's No.	Name	Cultivator	Appearance of Plant on arrival	Flowered or not	Present Appearance	Remarks and Treatment
21265	Primula vernicosa	5	In growth and with resting buds	No	Plants growing well outside	
21266	Primula Dickieana	1	Good condition	Flowered in May	Not too healthy	Was the heat too great this summer ?
21270	Notholirion macrophyllum	2	Good	Yes	Healthy	Grown well in box and pot.
21288	Aconitum sp.	1	Good	No	Two plants healthy	
21329	Primula eburnea	1	Good	Flowered March 1950	Healthy	
		5	Dormant. Good	Flowered beautifully	Healthy	Exhibited at R.H.S. and A.G.S. joint Show, 2/5/50. Received Award of Merit. Plants thereafter split up and growing well.
21337	Primula Calderiana	4	One small plant dormant	Yes	Good	Planted direct in peat garden. Major Sherriff saw this plant and considers that it is one of the *P. strumosa—P. Calderiana* hybrids.
21865	Primula Dickieana	3	Dry	One plant flowered May 22, 1950	Healthy	It seems to like a great deal of moisture, and is doing well in a peat wall facing west with plenty of shade, but if it will survive the winter in this position remains to be seen.

Ludlow and Sherriff Air-Mail Plants

THIS collection of plants which Mr. Ludlow and Major Sherriff sent to Britain, at no small amount of trouble and expense, was not merely a gift to a few gardeners who have been highly successful in the cultivation of difficult alpine plants. It was much more than this. For the recipients of the plants are more than good cultivators ; they are very generous distributors of the plants they cultivate. Ludlow and Sherriff's only object in sending home these plants by Air-Mail was an endeavour to work up in Britain a stock of certain beautiful alpines, so that one day they might be made accessible to all. Therefore, their's was a remarkable gift to all lovers of rare and choice Rock Garden plants. But *how* remarkable and generous was the gift can be fully appreciated only when one knows not merely how beautiful are the plants concerned, but how rare in cultivation most of them have always been and how in fact many of them are now in culture for the first time.

The following notes on some of the plants may help towards this fuller appreciation.

16356 *Paraquilegia anemonoides*, one of the finest of all cliff plants, has been intermittently in cultivation for the last 30 years at any rate, but has always been extremely rare. It was growing at Bodnant in 1923 and gained the Award of Merit for Mr. G. P. Baker of Sevenoaks in 1932. Dr. George Taylor recently wrote of it "I shall never forget my amazement on seeing *P. anemonoides* for the first time, and indeed for sheer delicacy, poise and refinement this plant must be supreme. I was stung by its perfection as it hung in aged tufts from dry overhanging rocks, the glaucous leaves a beautiful foil to the tremulous pale lilac flowers".

16704 *Meconopsis Sherriffii* was discovered in S.E. Tibet by Ludlow and Sherriff in 1936. Only once has it been in cultivation. The discoverers sent living plants by air-mail to this country in 1939. These flowered in a few gardens and in April 1939 Mr. R. B. Cooke exhibited a flowering plant at the R. H. S. Show. The species is an ally of *M. intergrifolia*, and the single pale pinkish or wine-red flower is held erect on 8-12 inch stems.

17198 19771 *Aconitum* new species. This is unquestionably the finest of all the dwarf Aconitums, and a really magnificent species which has as yet not shown its true splendour in our gardens. Ludlow, Sherriff and Hicks have made several ample gatherings, all of them in Bhutan. The field note of these two collections is as follows:—

17198 "Perianth bright violet purple, the two lateral segments with white edges, forming a V. The single flower is very large for such a small plant. Chiefly on rocks and boulders and sometimes on steep grassy slopes. Very attractive".

19771 "15,000 ft. Up to 4ins high ; perianth intense blue violet, two inner lateral segments margined white. Filaments and anthers black. Singly or 2-3 together in rock crevices, and on steep grassy banks. A very fine flower ; very late flowering. Seed cannot be ready until plants are covered by snow".

17204 *Aconitum pulchellum* is another beautiful dwarf species which has never been in cultivation.

17206 *Primula elongata.* Although seeds have been obtained frequently from the Changu locality of Sikkim, there appears to be no record of success in cultivation except for the 1937 record of Mr. Ronald Smith. Material sent by L. & S. in 1938 was still in cultivation with Major Shaw MacKenzie in 1945.

17429 21192 *Lloydia longiscapa* has been known since 1844, but I am not aware of any record of its having been in culture. (Fig. 30).

17444 *Primula tenella* flowered in Edinburgh in 1918, but the plants soon died, and I do not know of any other cultural record.

19146 *Diapensia himalaica* was described and figured in 1857, from Sikkim material. It is a most desirable plant which has never been in our gardens. (Fig. 28).

19167 *Primula tenuiloba* was discovered by Hooker during his classic exploration of the Sikkim Himalaya, but has never been in culture. It is a very dwarf species with bright bluish-violet flowers covered with long white cottony hairs, and with conspicuously narrow corolla-lobes.

19226 19766 *Primula Caveana* has been flowered at least once in this country—by Mrs. Shaw Mackenzie in Easter Ross in 1939, from Ludlow and Sherriff plants. As a rule the flowers are pale purple with a lemon yellow eye, but in some parts of Bhutan, Ludlow and Sherriff found that the flowers were all white and in other parts white and purple flowered plants were growing together.

19330 *Primula Waddellii,* found by Major L. A. Waddell, I.M.S., in 1891, in S. Tibet, has been collected on only a few occasions. Cooper, and Ludlow and Sherriff, found it in Bhutan. This is the first time in cultivation. (Fig. 26).

19420 21197 *Primula soldanelloides*. This is the first record of this dwarf species having flowered in cultivation although it was discovered by Hooker as long ago as 1849. The stems, 1-2 inches high, carry usually a large solitary white flower. Occasionally there are twin flowers, which may be tinged with violet. (Fig. 29).

19490 *Lilium Sherriffae* is a new species from Bhutan where it was found by Mrs. Sherriff and Dr. Hicks on the 31st May, 1949. The flowers are solitary and horizontally poised, and according to Mrs. Sherriff's field notes "maroon with inside of corolla chequered with gold."

19544 *Thalictrum Chelidonii* was first brought to our gardens a little over 50 years ago and in 1900 the Marchioness of Breadalbane gained the Award of Merit for her plants. It was always a rare garden plant however and has probably been out of cultivation for many years.

19610 *Primula Griffithii*. This is the first time this splendid Petiolares primula has been in cultivation and thus Major amd Mrs. Knox Finlay's is the first record of flowering.

19620 19674 *Conodopsis* new species. (Fig. 32). Professor Nannfeldt has identified this plant not as a new species but as *C. convolvulaceae*. This species is a very polymorphic one with leaves exceedingly variable in size and shape. These two gatherings correspond in the main with plants which Forrest collected and which were named *C. Forestii*. The flowers are large and blue and with a red ring at the base. But whereas the Forrest specimens appear to have the flowers quite glabrous, the flowers of the Ludlow and Sherriff gatherings are markedly hairy at the base within.

19710 *Aconitum* new species. Ludlow, Sherriff and Hicks gathered this at 14,000 ft. altitude in Bhutan, on the open hillsides. Rather reminiscent of *A. Forrestii* it grows to a height of 3 feet with magnificent compact spikes of clear blue-violet flowers.

19721 *Gentiana amoena*. Mr. Wilkie believes that the true plant is not in culture and that what is being grown as such is var. *major*.

19757 *Primula strumosa* was introduced to culture by Ludlow, Sherriff and Taylor by air-mail, in 1938, under the number L. S. and T. 6658. Plants flowered for the first time in Edinburgh, in 1939. Ludlow and Sherriff sent further plants by air-mail in 1943.

19768 A, B & C *Primula strumosa X P. Calderiana*. Among the colour forms among these hybrids Ludlow and Sherriff noted the following:—Flowers pure white with a golden eye; flowers half-way between pure white and the deep violet of *P. Calderiana*; flowers cream yellow with a golden eye. *P. Calderiana* is now fairly well known in gardens. The earliest cultural record appears to be 1887 when it was figured in the Botanical Magazine. It was again introduced in 1932 and in 1936.

19777 21185 *Primula Jonarduni* is beautifully figured in the Quarterly Bulletin of the Alpine Garden Society, Vol. VII, page 235, by Sherriff and Taylor who state that in Bhutan and S.E. Tibet "It grows in more or less open rock crevices, seaming the cracks with its leafy crowns which conceal the copious withered foliage of previous years". It is a member of a section notoriously difficult in cultivation, section Dryadifolia. This is the first record of this species in cultivation.

19832 *Primula umbratilis* var. *alba* requires a change of name. Everyone who has grown it side by side with *P. umbratilis* agrees that the two plants are very distinct. This plant probably is a new species.

19835 *Primula tsariensis* var. *alba* is a name not authentically published. *P. tsariensis* and *P. tsariensis* var. *porrecta* both with purple or violet-purple flowers, have been in cultivation since Ludlow and Sherriff sent home plants by air-mail in 1937-38. There is no previous record of a white-flowered *P. tsariensis* blooming in cultivation.

19856 *Primula* species (section Petiolares). This beautiful plant was figured on page 362 of Vol. XVIIIof the Quarterly Bulletin of the Alpine Garden Society (1950). It bears a striking resemblance to *P. gracilipes*, but is clearly not that species, as everyone who has seen the two together agrees. The nearest of kin of *P. gracilipes* is *P. petiolares*, a species which has never been in cultivation, although many Primulas have been in our gardens, masquerading under the name of *P. petiolares*. When I saw L. & S. 19856 flowering at Keillour I hesitated to name it *P. petiolares* for the reason that this species has been known only from Nepal whereas L. & S. 19856 was collected in Western Bhutan. Moreover I had had no opportunity of comparing the living plant of L. & S. 19856 nor even the Herbarium material of this number with the Herbarium material of *P. petiolares*. This I hope to do this spring, and by so doing correctly name L. & S. 19856. (H.R.F.).

21015 *Primula nepalensis* previously has been known only from Nepal and this is its first introduction to our gardens.

21044 *Streptopus simplex*. This is probably the first introduction of this Liliaceous plant. (Fig. 31).

21065 21266 21865 *Primula Dickieana*. Several attempts have been made to introduce this species, but this is the first record of its flowering in culture.

21152 *Diplarche multiflora*. There appears to be no record of the successful growing in British gardens of this species which was found by Hooker in the Sikkim Himalayas in 1849.

21187 *Primula Jigmediana* has been collected only by Ludlow and Sherriff in Bhutan. The plants which flowered at Bodnant and at Edinburgh in 1936, from L. & S. seed, have died. Mr. and Mrs. Renton's is the second record of flowering.

21218 *Primula bhutanica*, probably the finest of all the Petiolares primulas, was introduced by Ludlow and Sherriff, by air-mail, in 1936. It has been in cultivation ever since.

21219 *Primula bracteosa* was also introduced by air-mail, by Ludlow and Sherriff. It flowered for the first time in 1940.

21230 *Primula xanthopa* is now in our gardens for the first time.

Plants and Problems

Anemone obtusiloba var. patula from seed

THIS is not my recipe; it was given to me by a well-known plantsman in the west and it has proved most successful. The seed should be sown as soon as it is ripe, in fact whilst it is still green, probably in June.

Prepare the seed pan—equal parts of loam, leaf mould and sand does quite well—*and take the pan to the plant.* With the point of the finger gently knock off the ripe seeds on to the soil in the pan and at once cover with soil. Place the pan first in light shade, and in October in a cold frame. The seedlings should show through the soil in April.

M.L.

PITLOCHRY.

Anthyllis hermanniae

Among the European Kidney Vetches useful in the rock garden, *Anthyllis Hermanniae*, though not well known, deserves a place. It differs from the better known species of Anthyllis, e.g., *A. montana* and *A. Vulneraria*, by its sub-shrubby growth. Like a number of leguminous shrubs this plant revels in poor or sandy light soils in a site where the maximum amount of sunshine is received.

My specimen, after five years in a scree mixture, has grown into a knarled bushlet approximately 12 inches in diameter and height. The growth is reminiscent of *Corokia Cotoneaster* in miniature proportions, though the species may grow to a height of 2 feet when established in suitable conditions. The terminal shoots are shiny and devoid of developed leaves. These are greyish-green ovate-lanceolate and ¼ to ½ inch in length and borne at lower levels.

The growth is very compact and twiggy, the stem being wiry and the older parts assuming reddish tints which contrast admirably with the small yellow pea-like flowers which are borne profusely in axillary clusters during late June and July. The buttercup-yellow of the main body of the flower is relieved with a deep orange suffusion in the centre of the standard petal.

Culture is straight forward provided good drainage and soil conditions are created. Propagation is carried out by cuttings of partly ripened shoots, preferably with a heel. The percentage rooting at any time is usually not very high, and a 10% strike is a fair average. By insertion of a series of batches between July and

September one can be assured of some success. Cold frames are suitable for the operation and a sandy compost, e.g., equal parts sand and peat can be recommended. A trial this year using bottom heat in July, was a complete failure. Seed does not seem to set readily in this area, and at best only small numbers are found in each pod.

ARROLL L. WINNING, N.D.H.

PARKS DEPARTMENT,
KILMARNOCK.

Asperula lilaciflora var. caespitosa

This is a comparatively new plant, coming from the Eastern Mediterranean and it can be a great addition to the rock garden in late spring and early summer. I say *can* because I find it is very variable.

It forms a bright green carpet, and if it likes the position in which it is planted will give a continuous succession of almost stemless bright-pink little flowers, somewhat deeper and richer in colour than the well known *Asperula suberosa*, or correctly *A. arcadiensis*. I have tried this little plant in varying positions but recommend it for a really sunny pocket or slope or possibly for a trough.

The reason why I say that my experience with it shows that it is very temperamental, is that I have had two plants in practically identical positions planted in rather gritty loam: one had hardly any flowers on it at all and the other was literally covered for a long period with the little rosy-pink flowers. I wonder why this was so? I have so far been unable to increase it by seed, but if small tufts of the mossy green are removed in the late summer and put under glass with plenty of sand they root easily.

C.C.

KENDAL.

Campanula zoysii

This little Campanula, called by Farrer a "Rock Jewel", grows in the limestone cliffs and crannies of the Karawanken. It appears to be getting rarer and rarer in gardens, and seems seldom listed now-a-days in nurserymen's catalogues. I am glad to think that I have had it in my garden continuously for 15 years at least, and I should be sorry to lose it. *Campanula zoysii* has tiny spoon shaped very glossy leaves and long quaint little blue bells, puckered at the throat, and compared by someone to soda water bottles with ham frills at the end.

My experience with it is that it is a very "nervy" plant. If you find a place it likes leave it there, for then it will grow away happily and almost ramp; but woe to you if something upsets it; you may find that anyhow for a time nothing will please it.

All gardening books tell you it is difficult to keep because slugs love it so much. I grow it in a trough in a mixture of one part loam, one part leaf mould, a small quantity of peat and plenty of fine limestone chippings. During the war when it was not looked after much, it spread and came up in all sorts of odd corners. Of course I was a little too generous to visitors who admired it, and took off too many "bits". This upset it to such a degree that I am only just being able to reassure it, by soothing it and not disturbing it in any way. Dr. Roger Smith in his interesting article on Campanulas in the A.G.S. Bulletin tells us that he found it in quantity near the summit of the Skibuije Pass which forms the boundary between Italy and Slavonia.

I have mostly increased it by potting up small tufts in the early autumn, and treating them like cuttings. As it so hates disturbance of any kind it is better to sow seed (if you can obtain it). I usually can collect very very little as our climate in August is so uncertain and the seed is so often spoilt by rain.

C.C.

KENDAL.

Campanula pilosa

What I grow in the garden under this name is a Campanula to delight the hearts of all alpine lovers who want something that is neither fussy nor difficult, and that seems to require no special treatment at all. Before the war I had plants in my garden which bore the name of *C. dasyantha*, and in the article on Campanulas by Mr. Clifford Crook, in the A.G.S. Bulletin of 1938, he tells us that they are now the same plant, but that even in their native country of Japan, there are or rather were, discussions about the "best forms". This pretty little Campanula is now again listed quite frequently in some catalogues with or without the terms "superba" and "elegantissima" after it.

I grow *C. pilosa* in stone troughs and also in pans, but it is suitable for any sunny spot in the rock garden and I find it very tough and almost impossible to kill. It runs about by means of underground runners, and this makes it pop up in all sorts of unexpected places. The flowers are large for the size of the plant, are pale blue and hairy outside, and are carried on short stalks from above the rosettes of dark green leaves. Division makes this Campanula easy to increase.

KENDAL. C.C.

Cassiope tetragona

This dwarf Ericaceous shrub was first introduced, from Lapland, 140 years ago, but is still not common in gardens. This is surprising because it is the easiest member of this very charming genus to

grow. All the species have bell shaped flowers which in *C. tetragona* are of the purest white. They are held singly just clear of the foliage, at intervals along the younger parts of the stem. As in all the Cassiopes the leaves are small and tightly compressed against the stem, giving it the appearance of green whipcord. If there is a fault in this Cassiope it is, in our experience, that the lower part of the stems tend to go brown with age, and it may not be very long lived. But cuttings root readily, and the dainty display of the white bells against their vivid green background in spring, and often again in autumn, make *Cassiope tetragona* a plant well worth growing by all who can give it a lime free, and not too dry, soil.

L.W.

WIGTOWNSHIRE.

Centaurium scilloides

Better known as *Erythraea Massonii*, and often listed as *E. diffusa*, this plant is a member of the family Gentianaceae. It has narrow, clear, shiny green leaves, and bright pink flowers held well above the foliage, although the plant is seldom above 4 inches in height. In size and shape the flower resembles that of *Gentiana verna*, but it does not open its petals quite as wide. Although perhaps not reliably perennial, we have plants which have spread to a width of 9 inches; and we find many self sown seedlings. The flowers are produced in profussion from late June to mid-August—a very welcome addition to the rock garden at a time when many other plants are over.

L.W.

WIGTOWNSHIRE.

Cyananthus Sherriffii

Notes from the Card Index at Keillour

Cyananthus. sp.	Ludlow and Sherriff. 13329. Collected in S.E. Tibet, at an altitude of 12,500 feet on 17th October, 1947.
11/3/48	Seeds sown in pan in cold house.
24/3/48	Germinated.
10/5/48	Pricked off. 1 box and 1 small box.
April 1949	Plants from box 1 planted out in rock garden, full sun, good drainage, all surrounded by flat stones.
20th July, 1949	Bed now all in flower and looking well. If these plants withstand the winter they should make a good show next year. One plant has flowered on what would appear to be winter foliage (grey). This plant must be watched next year.

November 1949 Half-bed (top half) including grey foliage plant covered with improvised cloche made of "windolite" pegged down with iron pins.

April 1950 "Windolite" removed. Covered plants alive, uncovered—dead. Plants from small box retained in cold house over second winter, planted out to complete bed.

July 1950 Top half of bed flowering well but not the spring planted plants as yet. Grey foliage plant still quite distinctive and in flower.

August 1950 Bed now all in full flower and very pleasing. The grey foliage plant still quite distinctive and by far the loveliest—much more compact in habit, indeed with none of the lax growth of the type, which in this second year of flowering is more evident.

17*th August*, 1950. M.W.K.F.

Daboecia azorica

A native of the Azores, and an absolute jewel of a plant, *Daboecia azorica* is far too seldom seen in gardens. Closely akin to the better known *Daboecia* (Menziesia) *polifolia* it flowers earlier, and is valuable for filling the gap that may occur in June between the flowering of the late spring and the summer members of the heath family. In habit *Daboecia azorica* forms a compact shrub not more than a few inches high but eventually as much as 3 ft. across. Above the small dark green leaves which are almost white beneath, the egg shaped flowers—a dazzling ruby red—give a display which is bound to attract attention in any distinctive company. *D. azorica* is propagated quite easily from cuttings. These soon grow into mat-forming clumps which increase in size without ever becoming straggly or unmanageable. Its reputation for doubtful hardiness seems undeserved as it has here come through 30 degrees of frost without any protection.

L.W.

WIGTOWNSHIRE.

Gentiana amoena

My experience with this Gentian is not at all satisfactory, for so far I have been unable to induce it to flower.

I should like to see it in flower so much, and hope that these few lines may persuade someone who grows it to give me a few hints. In other words I want, as the B.B.C. would announce it "to start you talking". *Gentiana amoena* is a very high alpine Gentian for it grows in Sikkim at 14,000 to 18,000 ft. It makes a straggling

mat of overlapping leaves and frequently has some dead shoots amongst the vivid green. Grown in a pan it does quite well with me and seems contented and happy but—never a flower.

Will someone help me by giving some advice on the treatment it requires ?

C.C.

KENDAL

Gentiana trichotoma

I should like to hear other gardeners tell of their experiences with this Gentian. I believe when first introduced into this country, it was given the name of *Gentiana Hopei*. I imagine there must be some very good and some not so good plants of this species in gardens at the present time. I have not had it in my garden for many years, but from my small experience of it, it is very variable. If you can give it the position and soil that it likes it will reward you in June or July with flowers of such a glorious iradiscent seagreen blue, that they have to be seen to be believed.

I wonder if the soil has any effect on the colour of the flowers ? Last year I had a plant of *G. trichotoma* which I planted in rich gritty soil, facing west, and when in bloom it drew me like a magnet to look at the wonderful almost luminous greeny-blue flowers. This year the same plant in exactly the same position, having survived the winter quite happily, flowered again, but it did not seem to me as though it could be the same plant for the flowers were disappointing after the memory of the year before, and not nearly of such a vivid glorious blue. Had my memory exalted the beauty of the colour too much, or had the plants missed something in the feeding and treatment ?

Seeds seem the best method of increase. I collected seeds last year and sowed them in January this year ; they germinated well and though the seedlings looked strong and healthy I regret to say that only one has survived the pricking-out stage.

C.C.

KENDAL

Mertensia coriacea

On the highest acres of Pike's Peak in Colorado, this loveliest of all Mertensias makes unforgettable sheets of vivid blue. Unfortunately many people find it a difficult plant to cultivate in this country, although here in the Highlands it is fairly easy to manage.

It is a plant of arid granite screes and full sunshine, and I have little doubt that overfeeding is the cause of many failures.

Here we grow it in an austere granite scree, and also in pans in the Alpine House where it thrives in a very porous light compost consisting of much grit and coarse sand and some sterilised leaf

mould and loam to which has been added the requisite amount of John Innes Mixture.

Where it is suited it will be found to be a comparatively long lived plant and in earliest spring it will send out its prostrate stems of glaucous blue leaves, making small mounds on old plants. These are covered with a plentiful supply of large wide open Forget-me-not like flowers, pink at first, turning to vivid sky blue.

The flowering season covers many weeks beginning in February and March. Its enemies are over feeding, heavy soil, bad drainage, lack of enough sunshine, and possibly lime. It can be increased easily from seed which it sets fairly freely.

J.D.

AVIEMORE.

Nomocharis Seedlings

It is stated frequently that Nomocharis seedlings are difficult to transplant; that the seeds should be sown thinly and the whole panful of seedlings planted out intact. But I have found that seedlings transplant well if the transplanting is done immediately they poke their noses through the soil in the Spring.

By the way, is *N. saluenensis* more quick to flower than the other species? Seeds of *N. Farreri*, *N. Mairei*, *N. nana* and *N. saluenensis* were sown on 26/3/48. All have grown well but only the latter has flowered this year.

M.L.

PITLOCHRY.

Petiolaris Primulas for the Alpine House

These lovely primroses, flowering so early in the year, should make ideal Alpine House or Cold Greenhouse plants. But I find that, during the very severe winters which we experience here in the Cairngorms, pot and pan grown specimens invariably succumb if kept in the Alpine House.

After several experiments, I think that I have found the answer —or at least a compromise.

The primulas are potted up in their pans or pots in late summer and are then plunged outside, up to their rims, in old sawdust or other such moisture-holding material. Frame lights or cloches are put over them in early November to prevent damage to the delicate flowers and often mealy leaves by snow and rain.

In this way it has been found possible to bring these plants safely through the worst winters in their pans and it is an easy matter to lift the pans and bring them into the Alpine House as soon as growth begins in earliest Spring.

I pass this information on for the benefit of other gardeners in cold regions who may have suffered in the same fashion.

J.D.

AVIEMORE.

Phyllodoce aleutica (Fig. 27)

Phyllodoce aleutica is one of some half a dozen species which comprise this most attractive genus. It has small green leaves, pale beneath, and lemon-yellow nodding pitcher shaped flowers. These are held well above the foliage, generally 3 or 4 together, and give the plant a most distinctive appearance. Well established clumps may be nearly 2 ft. across. *Phyllodoce aleutica* flowers freely from about mid-April to mid-May, and often again in the autumn. It can be increased by means of seed or cuttings, but we find that the latter do not root quite so freely as those of most Phyllodoces.

L.W.

WIGTOWNSHIRE.

Polemonium confertum

This difficult member of an easy genus is, when suited, one of the loveliest spring-flowering plants imaginable and is worth any amount of trouble.

The difficulty is to induce it to produce those great clusters of deep blue, orange-anthered flowers, on their 8 inch stems. This is the ecret. Feed the brute !

Here, we have our best success growing the plants in pans in the Alpine House. We grossly over-pot them in a good, light, porous compost to which the John Innes mixture has been added. This potting-up takes place soon after flowering, as the plants must have completely new rich soil to build up enough energy during the growing season to induce them to flower the following spring. When repotting, which *must* be done *every* season without fail, it will be found that the plants have made great masses of roots which break away very easily when an attempt is made to shake out the old soil. This does not seem to matter in the least and it is quite essential to get rid of all the old soil, necessitating breaking off quite half the roots which have been formed. New roots form very quickly and thrust their way strongly into the new soil.

The same treatment must be given to plants in the open ground. These must be lifted every season after flowering, the old soil removed and replaced by a rich but light and gritty compost with plenty of leaf mould. An added help will be a cloche over them in winter.

Give the plants an open sunny position, for in nature they inhabit high open meadows in the Rocky Mountains.

AVIEMORE. J.D.

Mr. Jack Drake told *me* to "feed the brute". I did ; an extra ration of John Innes Base and bone meal and about an inch of well-rotted compost over the drainage. My plants in pots in a cold frame grew well and produced fine foliage—but no more flowers than in the poorer compost the previous year. The plants in the open I dug up in September, and planted again in two clumps over good drainage in soil well enriched as in the pots. As a result of my labours one clump gave me a poor flower truss. The other did not even show itself above ground in the Spring. I therefore dug it up, thinking it was dead. But when I saw that it was going strong underground, I replanted it. The wet season however seems to have been too much for it, for on digging down for it today (September 21, 1950)—it was dead.

M.L.

PITLOCHRY.

Primula Cawdoriana

So far I have found *Primula Cawdoriana*, of the Soldanelloideae Section, one of the easiest to grow of the high alpine primulas.

It has not only lived and flowered well, but has set seed which has germinated well.

I grew a quantity of seedlings from the seed collected by Ludlow and Sherriff in 1947 in S.E. Tibet and thus was able to experiment with then outside in the open as well as in frames.

Knowing our Westmorland climate so well, and the incessant dripping we get in the late autumn and early spring from over-hanging trees, I took the precaution of positioning some plants where they received a certain amount of protection from over-hanging stones on a wall facing north. These survived the winter, (with a glass over their heads) and they have flowered well and set some seed.

Last year I collected seeds from the original plants and these too germinated well, and are now in a cold frame for the winter, so I really hope I have this delightful Primula really established. *P. Cawdoriana* does not seem so faddy about soil as some Primulas ; John Innes compact, "my own mixture", anything that is good and rich seems to suit it ; but I have yet to try it in my peat wall. The one failing I find in this Primula is that it seems susceptible to what in my ignorance I call "rust". The outer leaves suddenly take on a rusty appearance and one by one fall off and the plant eventually dies.

C.C.

KENDAL.

Primula Reidii

This very beautiful Primula with its nodding ivory white flowers belongs to the Soldanelloideae Section and, like most members of that group, is either short lived in garden cultivation or simply refuses to accept the changeable weather conditions of this country. For that reason it must, if it is to be retained, be treated as a plant for culture in the Alpine House or frame.

I always regard *P. Reidii* as the first favourite at Branklyn not only on account of its charm but because it was the first special plant which came under our care following upon a visit in 1925 to Glendoick, the home of Mr. E. H. M. Cox. In the cool greenhouse there, six tiny *Reidii's* were in bloom in small pots. I was speechless with delight on being given the best plant to take home. Fortunately seed duly ripened and from this original plant we have been able to retain *P. Reidii* in reasonable quantity and have had the satisfaction of distributing it to many gardening friends.

We have grown *P. Reidii* outside on several occasions but have found that though it may survive for two seasons (with glass protection in winter) it cannot be regarded as a permanent plant for garden culture even under most favourable conditions. It's place appears to be the cool greenhouse where it is a perfect plant. An additional charm is it's faint Freesia-like perfume.

As to culture—seeds sown in February usually germinate freely within two to four weeks but the tiny seedlings require careful watching to prevent them damping off. Pricking out, almost before it appears to be possible to do so, is advisable. We find seedlings pricked into pans or pots always grow more successfully than those pricked into boxes. The sharper drainage of well crocked pots may account for this.

The soil mixtures used for seed sowing and potting are of the well known John Innes type. The plants are kept in open shaded frames during the growing season but always glass-covered during the winter and early spring. Frequently many of the seedlings flower when one year old, and from these plants seeds are again gathered and the cycle of beauty is thus continued.

J.T.R.

PERTH.

Primula Sherriffae

An amazingly beautiful member of the Soldanelloideae Section of Primulas is *P. Sherriffae*, which was discovered by Major George Sherriff in 1934.

I cannot resist a little boasting about the behaviour of this primula with me, for nearly every book or handlist into which I have

looked, describes it as "half-hardy" or for "a cool greenhouse only". Now my experience with it is that it is the most difficult primula to *kill* that I have, though I quite recognise the fact that my plants are very small in size and do not attain the beauty and magnificence of those in the cool house at the Edinburgh Botanic Garden.

This remarkable and unique Primula is conspicuous for its very long corolla-tube. The leaves are borne in a flat rosette, somewhat resembling a primrose. The flowers themselves are very beautiful, varying in colour from a pale violet to a soft lilac, with a white edging, and are slightly flecked with farina. They are funnel shaped and the long curved tubes are about 2 inches long.

I have had this Primula for about 12 years and I have never obtained any but the original plants. Each year I test its hardiness further. Up to the present time I have always protected it slightly during the winter months, but this year I am going to experiment further by leaving a few plants entirely unprotected under a west wall.

Primula Sherriffae is easily increased by seed or division. Seed usually sets very freely, and my usual method is to sow the seed as soon as ripe in a fine mixture of loam, leaf mould, peat and sand. The germination varies, but some seedlings generally appear within a few weeks of sowing. These I prick off as soon as large enough the following spring, and if potted up the next autumn they usually flower in their second or third year. An additional attraction to this primula is that in the alpine house it has a lovely scent somewhat like *P. nutans*.

I read that *P. Sherriffae* was found at an unusually low elevation for Primulas, growing and hanging amidst sheets of wet moss and overhanging rocks, and certainly it stands the winter wet of Westmorland far better than a great many of the rare Primulas that I have attempted to grow.

C.C.

KENDAL.

Saxifraga strigosa

This little saxifrage has been gay for weeks with its dozens of small golden-yellow flowers. Starting to flower in August it has gone on through September and October, and however hard it has rained and however long, or however strong, the wind has blown, there it has been just as cheerful looking as ever.

It was raised in 1948 from seeds collected by Mr. Ludlow and Major Sherriff and distributed under the number L. & S. 13317. It has slender, wiry, much-branched stems about four inches high and its starry golden flowers are a little over half an inch across. The leaves are mostly basal and the few narrow stem leaves do not in any way hide the flowers.

Referring to Farrar's "The English Rock Garden" one is shocked to read of this plant:—"It is dowdy in appearance, difficult in temper and tender in constitution". And as Corevon in his "Rock Garden and Alpine Plants" refers to the *white* flowers one wonders if the *S. strigosa* of these authors can possibly be the same plant as that of Ludlow and Sherriff.

Where it has done so well with me is in a more or less shady bed, in lime-free soil, and associated with Cassiopes and such like things. It has not yet had a hard winter, but it should be reasonably hardy as Ludlow and Sherriff found it at 11,000 feet altitude in S.E. Tibet.

R.B.C.

CORBRIDGE.

Stachys corsica

This plant is one of the most accommodating in our light gritty soil. It grows quite flat on the ground forming neat rosettes, the small green leaves setting off the cream coloured flowers nestling among the foliage. At first glance the flowers appear to be sessile, but on closer examination tiny flower stalks are apparent. The flower itself resembles a small seashell, almost white, daintily fluted and flushed with pink. It is a most unusual and charming little creature, and it flowers continuously throughout the summer. Although quite reasonably hardy *Stachys corsica* needs perfect drainage. Given that, it creeps about and soon forms a spreading mat.

W. L.

WIGTOWNSHIRE.

The American Rock Garden Society

Probably most members are aware of the existence in the U.S.A. of a Society comparable with our own. Some members may have wished to join this Society but have been deterred by the apparent difficulty of transmitting their subscriptions.

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

The annual subscription is 3½ dollars, or 10 dollars for three years if paid in advance, and the Secretary, who will send further particulars, is Mrs D. E. Hansell, 19 Pittsford Way, Summit, New Jersey, U.S.A.

In addtion to its bi-monthly Bulletin, the American Society has a Seed Exchange in operation and issues special plant leaflets under the name of Saxiflora.

● Important Notice ●

Will Members please note the changes in the names and addresses of the following Office-Bearers, to whom relevant correspondence should in future be sent,

Hon. Secretary:
Squadron Leader J. J. Boyd-Harvey, Boonslie, Dirleton, East Lothian.

Hon. Editor:
J. L. Mowat, University Botanic Gardens, St. Andrews.

Hon. Treasurer:
T. C. Steven, C.A., 42 Castle Street, Edinburgh.
(Change of address only).

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