

1990

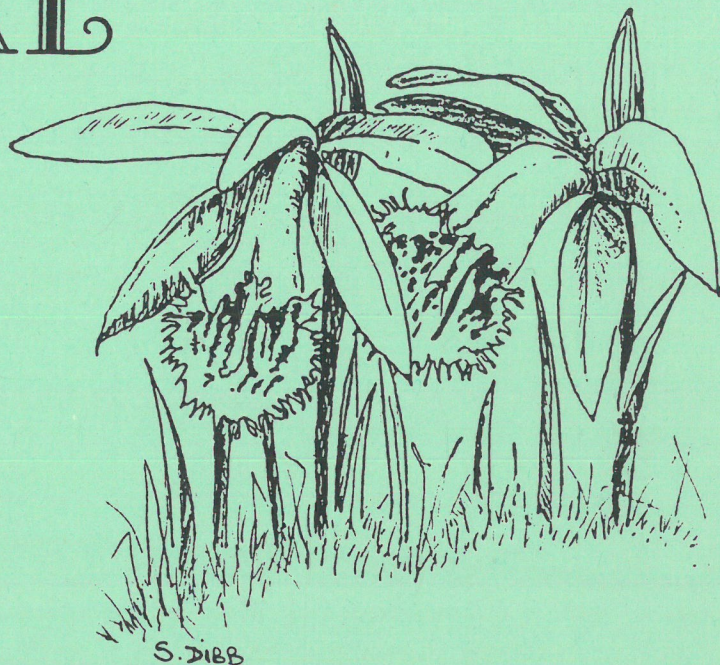
NATIONAL

PLEIONE

REPORT

INCORPORATING

HARDY ORCHIDS





NATIONAL PLEIONE REPORT 1990

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HARDY ORCHIDS

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Cover illustration of Pleione Eiger by Sandra Dibb

A NOVICE FROM KNOWLE

I have just had the pleasure of reading my first National Pleione Report. I have found it so interesting to read so many varied articles from such a wide range of places.

My first attempt to grow Pleiones was an utter failure, it was in September 1985. I bought three bulbs of **P.formosana Lilac Beauty** from a well known BULB firm, the cultural instructions given were as follows, place the bulbs on the top of a well draining potting compost, I thought this meant plenty of gravel added. However the compost I used at this time was 3 parts J.I.2. 1 part Sharp Sand. I didn't give them any water as they were standing outside on the North side of the house. I didn't get any flowers at all only a few leaves, as you can guess I was very disappointed. Of course I now know that the compost was completely wrong and so was the watering.

However I didn't give up, in 1986 I thought I would try again this time with a little more success. I bought some medium grade orchid bark from a garden centre and made up the following compost. 3 parts Orchid Bark, 3 parts J.I.2. 3 parts Peat and 1 part Coarse Gravel, and when my first flower appeared I felt it was all worth waiting for.

In 1987 I bought my first named hybrids. I chose the ones that said easy and vigorous and to my great delight I had a wonderful show with **P.formosana Claire**, **P.speciosa**, **P.Hekla** and **P.Vesuvius** which I think was my favourite.

I was now beginning to feel more confident, and with the help of a telephone call from the gentleman that supplied the bulbs I purchased **P.Rakata**, and it really is a beautiful flower.

In 1989 I entered a pot of **P.Versailles "Miss Holt"** in our local show under Orchids. My little pot caused quite a stir, it was so dainty, and the colour

was so good. I got second, but the plant that came first was so ugly, it was very big and no colour at all in the flowers to compare with the Pleione, so you will understand why I found the chapter on 'Thoughts on Showing Pleiones' of such a great interest.

I should add that in all cases from 1985 onwards as soon as I saw any buds at all I brought all pots into a frost free greenhouse, and put them as near to the light as possible.

Another growing year will soon begin, and I shall now be looking forward to a good flowering 1990 and hopefully my first **P. Shantung**.

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PLEIONES IN ROCKWOOL

I suppose if some of the compost used by Mr Ian Butterfield had been obtainable from my local garden centre, I wouldn't have used rockwool at all.

Having purchased by mail order about twenty five Pleione pseudobulbs, I now wanted to grow them at their best. At the time the only compost I had in the greenhouse was a bag of Wellbank Rockfibre. Now Wellbank Rockfibre is just the stuff to grow **Cattleyas** and **Phalaenopsis** in the warmer section of the greenhouse. How would the very cool growing Pleiones react, I wondered.

A visit to Ted Lloyd at Wellbank proved that I need not worry. Ted grows Pleiones in rockwool very successfully so why shouldn't I.

Pleione pseudobulbs which have been prepared for planting are placed on about two inches of rockwool in half pots. More rockwool is then filled in around the

pseudobulbs leaving about a quarter of the bulb above the surface. It is not necessary to 'crock' the pots before filling with rockwool.

After planting I place pots in trays lined with water matting and water pots until the water matting is also wet. Trays are left in the coolest section of the greenhouse. No heat is required unless temperatures drop below about 40°F.

Flowers are very quick to grow and last well if kept cool and in light shade. Do not allow pots or matting to dry out.

After flowering I start to feed with half strength Phostrogen at fortnightly intervals.

About the end of April, weather permitting, the trays containing pots and water matting are placed on staging outside in a shaded area of the garden. There they can continue to grow until the leaves begin to die off. Pots can then be allowed to dry out gradually under cover.

I start to sort out the new pseudobulbs from the dried rockwool toward the end of November. Care should be taken when handling the dried out rockwool. It can be very much an irritant. Wear gloves and mask if you feel it necessary.

Although rockwool is available from various other suppliers, I have only used the Wellbank Rockfibre. It seems to have the right balance of water repellent and water retentive rockwool. I have also found that new pseudobulbs grown in rockwool are larger than the original pseudobulbs grown in the more conventional composts.

It would be wrong of me to say that this is the best way for everyone to grow their Pleiones. I'm sure there are many growers who grow Pleiones as well as I do but in their own chosen compost. Rockwool just happens to be the stuff in which I grow them best.

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PLEIONE IN ITS NATURAL ENVIRONMENT

At my orchid baptism more than 50 years ago I learnt that orchids were either terrestrial or they were epiphytic. If they were terrestrial they were hardy and grew in soil. If they were epiphytic they came from hot places and needed heat, soil was poisonous to them, and compost was *Osmunda* and *Sphagnum*. Furthermore, with very few exceptions, all of the species of one genus were the same in this respect. One outstanding exception was *Cypripedium*, which has now been split into terrestrial *Cypripedium* and an epiphytic *Paphiopedilum* so that the rule has been reinforced.

When I got interested in *Pleione* 20 years ago I soon realised that it was difficult to grow and that part of the problem was that it is neither a typical epiphyte nor a typical terrestrial. This led me to wonder just how does it grow at home. At the time China was closed and there seemed to be no possibility that it would ever be opened. Hunting through the old collectors field notes, and looking at the comments written on the herbarium sheets, the first thing that became obvious to me was that the Indian *Pleiones* are almost invariably epiphytic growing literally on the trunks of trees or only occasionally 'on mossy boulders' or such like. One could easily imagine that so far as a *Pleione* is concerned there is little difference between a mossy tree trunk and a mossy boulder. However Chinese *Pleiones* were rarely stated to be epiphytic. The most frequent locations are cliffs, or rocks, or 'dry places'. By contrast, and especially with the taxon 'Henryi' which is now included in *speciosa*, the location was often described as 'wet rocks' and I couldn't imagine what sort of an environment that is.

I have now been to China twice studying *Pleione* at home. Apparently most of them do grow in an epiphytic fashion but on mossy rocks rather than on trees-

6 that is strictly epilithic rather than epiphytic. With these plants the roots do not come into contact with the soil and the bulbs are partly exposed to the air though frequently nearly buried in moss and lichen. However two of them- **yunnanensis** and the hexaploid form of **bulbocodioides**- are terrestrial with the bulbs completely under ground, as much as two inches, in very dry soil. In both cases, epilithic or terrestrial, the plants grow in a dry environment and coping with water deficit must be a key part of their survival strategy.

In complete contrast is the environment of **speciosa**. This grows on dripping ledges on cliff faces where water is seeping out from underground. It grows with **Chrysosplenium** which grows in Britain in exactly the same environment. **Speciosa** is never short of water - it's roots are always submerged, and I suspect that even in Winter the bulbs are wet. So now I know what wet rocks are. It is perhaps interesting to note that all **speciosa** are tetraploid and that the only other natural tetraploid known is the common form of **limprichtii** which in turn is the only other well known **Pleione** apart from **speciosa** described as coming from a wet habitat.

Does this mean that we should grow **speciosa** wet? The answer is most emphatically no. This is not as contradictory as it might at first appear. Many plants grow naturally in, and are limited to, a strange environment because they can tolerate it and not because they need it. Thus few salt marsh plants actually need salt. Most of them will tolerate what is a lethal concentration to normal plants and consequently they can survive this harsh environment. In the absence of competition they actually grow better without salt, but under natural circumstances in a salt free environment they cannot compete with other more vigorous plants. So it is with **speciosa**. It does not thrive on over-watering, but it will tolerate it better than most **Pleiones**. Actually it does grow better I think in slightly wetter conditions than most, but it must be

well drained and have no hint of waterlogging.

Another difference from most Pleiones concerns Winter storage. Most Pleiones can be kept bone dry for five months without the slightest change - but **speciosa** shrivels a little if absolutely dry. It is noticeable, but I don't think it does any harm. However I do try to keep **speciosa** very lightly damp in Winter as the plumper bulbs are more satisfying to me, and it doesn't seem to do them any harm even though I don't know that it does them any good.

Speciosa is unique among the common Pleiones in these features. We are living in exciting times with new Pleione species appearing nearly every year. So far in my limited experience most of the new ones will grow, perhaps not quite as well as we would like, in standard Pleione culture. However I think **scopulorum** is different. It appears to be even more extreme than **speciosa**. The shrivelling of the bulbs if kept dry in Winter is very marked and I think that the Summer water regime is more critical too. I am sure that the need for adequate drainage and no waterlogging remains, but in **scopulorum** I think that any length of time in drought is deleterious.

D. J. HARBERD.

ANGLESEA PLEIONES

The first week in March saw the usual mad repotting session. As the Winter had been so mild, I had stored all my Pleione cultivars in a refrigerator at 0-2°C for at least January and February. Most species and hybrids were potted

up in March with the usual exceptions of *hookeriana*, *humilis* and *Sorea*. *Humilis* (which has risen very high on my list of favourites) was allowed to flower (in mid February) before re Fridgeration. All bulbs were cushioned in fine dry moss peat and rolled up in polythene bags before boxing up for re Fridgeration. The long termers (*hookeriana*, *humilis* and *Sorea*) were as usual, re Fridgerated until the first week in May, after which they were brought on quickly in the warmth of the late Spring greenhouse.

The compost used this year was my usual bark based mix (derived from a Butterfields recipe) : 6 parts medium bark; 1 part coarse perlite; 1 part finely chopped woodland moss; 1 part moss peat. I have given up on the charcoal because I do not find it essential. As a top dress filler, this year I used a 1:1 fine orchid seedling grade bark and finely chopped moss. I had access to some fresh sphagnum moss early in the year (courtesy of Mr Nigel Brown - curator of the University College of North Wales Botanic Gardens, Treborth) which I used to repot my *praecox* and *praecox* hybrids. The sphagnum managed to stay alive and even grew substantially later on in the Summer, despite being watered the majority of the time with tap water! I cannot say that the plants did any better for the sphagnum.

I decided to try and combat my usual leaf-tip die-back problem this year by having the potting compost moist to begin with. I also started watering much sooner in the growing season. Well, it worked. Only a few leaves succumbed to die-back, the majority were excellent. I also recommend not adding fertilizer of any description to the compost at potting time. It is not necessary if a regular programme of dilute liquid feed is adhered to, and the presence of fertilizer concentrate particles may well contribute to Spring root death and "apparent" watering problems.

Later on in the Summer, I had a thermostatically controlled extractor fan

installed. It certainly has proved it's worth, especially as the hot Summer was seemingly reluctant to give way to the Autumn. The hot, dry weather has taken it's toll on some bulbs, particularly **hookeriana**, which seems smaller than previous years. As a very high altitude species, this is not surprising.

Tiny bulbils of **humilis** scattered on perpetually moist, fine leaved woodland moss, and secreted away in a dim, cool corner of the greenhouse, have grown like mustard and cress. Some day I hope the majority of these minute propagules will grow on to maturity and give me a display to remember.

One of my favourites, **Pleione X confusa** was obtained in Spring 1986, produced two flowers (and thus bulbs) in 1987. I have had only two flowering size bulbs ever since. However, a few tiny, "petit pois-like" bulbils have been produced each season, and now the earliest of these have developed into a couple of very near flowering size bulbs! I await next Spring with great expectations. **Confusa** is not only a handsome flower, but an attractive plant too.

One unfortunate mistake was made this Autumn with two clones of **praecox**. Thinking they were developing too slowly, I brought them into the warmth of the house to bring them on. Sadly, they not only stopped growing but the small buds (1cm long) died! I think the lesson here is to leave well alone.

All my Pleiones seem to flower more or less well except a delightful clone of **formosana alba**. (It was mentioned in last years N.P.R.) Well this year was no exception. In an attempt to rectify the situation, last Winter I retained half the bulbs in the relatively mild greenhouse (10°C) and the other half were given two months at 0-2°C. The following Spring, the bulbs were further divided for a planting depth experiment. Half were completely buried and the others were placed on top of the compost. All the treatments produced good lush growth but no flowers yet. Next Spring, however is eagerly anticipated.

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NEWS FROM NEW ZEALAND

In this area, about the centre of the South Island our climate conditions are noted for the fact that we record both the highest and the lowest New Zealand temperatures. Light intensity is one of the highest in the world; annual rainfall around 700mm, frosts about -10°C considered to be quite severe in relation to more northern parts, but usually followed by clear sunny days. Summer temperatures can reach the mid thirties but nights are cold until well into Summer. We also have a lot of warm North West winds which are not very much to the liking of Pleiones!! I grow them in the main in a shade house using the potting mix recommended in the Curtis monograph, and can expect flowers from late August until early November not having as yet any of the Autumn flowering varieties. In a south facing area where almost no sun reaches them they do extremely well, flowers last longer and the clumps get bigger and brighter each year. In fact some varieties perform better outside than in the "seclusion" of the shade house. In both areas I give liquid feeding with "Phostrogen" being the basic one. A regular procedure in the Summer months is syringing the foliage with water after hot days. Not much problem with pests except caterpillars and occasionally slugs. When liquid feeding I quite often introduce a fungicide as well "just in case". I repot annually in the shade house but those growing outside just get left alone in that respect.

In the Auckland area growers are faced with high rainfall, with very humid conditions during Summer but also spells of hot drying winds which tend to stunt the foliage, with a consequent decrease in the size of the pseudobulbs. Being near the top end of the country frosts are not very common, but can occur although not usually in the severe range!! Winter is noted for it's consistent rain.

Other types of orchid are more popular as a consequence of the climate not being quite suited to Pleiones. In general from central North Island southward could be deemed more suitable areas due to a more pronounced drop in night temperatures. As a further comparison in the lower parts of North Island and as far down as Canterbury while day temperatures can be about the same as those further north the much lower night temperatures virtually dictate what can and cannot grow.

In what can be termed the "bottom end" of the South Island most growers have to use glasshouses but in the area further north but a little below the province I live in, the leading commercial grower uses a shade house, and also grows Pleiones outside under deciduous trees. In this area frosts of 12°C plus can be expected with an annual rainfall of about 800mm and a high Summer temperature coupled with high light intensity. Magnificent pseudobulbs come from this grower!!

In general most enthusiasts stick with the 'Curtis' basic mixture but additions or alterations are often the order of the day. We inhabit a small pair of islands with a consequent big temperature and rainfall range, so mixtures and feeding can alter to suit locality. As an example this area while only about 16Kms from the coast we call inland, but if I were growing Pleiones about 30Kms further inland in what is often referred to as the rainbelt i'd be making my potting mix more open to allow for that.

There are very few specialist growers marketing Pleiones, and one finds it hard to get anything other than hybrids with true species *humilis*, *praecox* etc. being almost unheard of. Unfortunately these have to be imported and hereby comes a problem. Some years ago virus was found in *Cymbidium* orchids, so a 'blanket ban' was placed on all orchidaceae in that while flasks are acceptable mature bulbs must be quarantined. Quite an expensive procedure, and with

acclimatising not being the easiest it does not present a very viable proposition for the commercial grower unless he has a following of rich customers. Growing from seed is also a slow process and here again it is usually done by enthusiastic amateurs.

I suppose it could be said that about three quarters of New Zealand is suitable for *Pleione* culture, and I like to think that i'm fortunate to be living in one of the best areas for growing this fascinating genus.

IVAN D. RANKIN F.R.I.H.(N.Z.) Ashburton, New Zealand.

CYPRIPEDIUMS IN PANS

The growing of "hardy" terrestrial orchids, and in particular *Cypripediums*, seems to be gaining in popularity, as a visit to any of the London or provincial shows will prove. This may have something to do with the present day difficulty in obtaining them, due to the Worldwide ban on collecting and importing them. Prior to the CITES restrictions on imports many *Cypripediums* (as well as other genera of orchids and plants) were dug up by the thousands and openly on sale through specialist nurseries, and generally at an affordable price. They were treated as just another plant to beautify the garden or greenhouse, albeit they had a certain mysticism about them, and an orchid was a rich mans hobby. Little information was offered on how to grow them and that which was was very often plagiarism of some ancient advice promulgated by Victorian writers. Where lime was suggested, for instance, the advice was generally to

"add some old mortar rubble"! Those with the few shillings to spare bought them, potted or planted them and then blamed the plant's demise on the quality of the plant or the difficulty in growing them. Many thousands of orchids (maybe even millions Worldwide) met such a fate. It would be interesting to know just how many orchids, and in particular *Cypripediums*, purchased say fifty years ago still survive, even ten years ago! I would suggest that far less than 10% of plants sold survive longer than a year or two, even today.

The reasons I think are twofold. Firstly, many of the plants were badly damaged during collection from the wild and then they were subjected to intolerable conditions during transit, they probably weren't packed too well either. The importer, to offset his losses because of the arrival of many already dead plants, divided the survivors into as many saleable plants as he could. Many such divisions having the barest number of roots, if any at all. Secondly, the vast majority of plants sold, even the healthy ones with a good root system, went to people who really didn't know anything about growing them, other than the advice given in the Nurseryman's catalogue or in some ancient tome.

Orchids for the garden or cold greenhouse have fascinated people for a very long time and so it is surprising that no book on the subject of growing them has been written until last year. "Orchids for the Garden and Frost-free Greenhouse" by Phillip Cribb and Christopher Bailes published by Christopher Helm is the first book on the subject by people who have researched the problems and made their findings available.

Darnell's book "Orchids for the Outdoor Garden" published by L. Reeve & Co. in 1930 was an attempt by the author to give some general guidelines on cultivation to the many would-be growers of these (then) freely available plants. He took it a stage further by describing 977 orchids, from practically every temperate region of the World and suggested that, with care and the right grow-

ing conditions, they could be grown in the garden, here in the British Isles! It is an interesting book but really of little use to anyone who wants to grow terrestrial orchids with hope of success.

Even today experts tend to disagree on certain points concerning cultivation. The prime controversy centres on the importance of the symbiotic relationship between the orchid and a mycorrhizal fungus. One school of thought suggests that this symbiosis must continue throughout the life of the plant for it to thrive. Another suggests that, having passed the mycorrhizome (juvenile) stage of it's developement from seed, to the true tuber or rhizome the mycorrhiza is of little or no importance, that the plants root system is capable of sustaining the plant. The first school suggests that the compost used should be able to sustain the growth and survival of the mycorrhiza, this will then ensure the health and wellbeing of the orchid. The second school suggests that the compost should ignore the needs of the mycorrhiza and it should be mixed to suit the type of orchid being potted. While I am in no position to disagree with either school of thought I feel that there are genera that fall into both categories. However I also feel that any terrestrial orchid will be happiest in a compost that does not cause the demise of the mycorrhiza. I feel that it should be encouraged to flourish, after all it can't do any harm to the plant. Not being in the least bit scientific I have no way of knowing what constitutes a compost suitable to the welfare of the mycorrhiza. What I do know is that orchids I have grown in pans for many years (*Cypripediums* and *Calanthes*) still show the mycorrhiza healthily growing on their root system, so I must be doing something right in my compost mixes. Incidentally, I have never used a proprietary brand of compost when potting orchids, preferring to mix my own. Unlike the John Innes Instute I am totally unscientific when mixing my composts. I rely on my own judgement of what each orchid needs and, I suppose, it's because

of this that I fail miserably with some genera - Pleiones being one and Ophrys another.

When repotting a healthy orchid, with it's attendant mycorrhiza, I always retain a certain amount of the old compost and mix with the new, just to be on the safe side! I assume that if the compost has kept the plant healthy for a number of years (I repot every third year) then I suspect that it is heavily impregnated with the relevant mycorrhiza.

Suggested basic compost mix

I also use this mix for my *Calanthes* and *Arisaemas*.

2 parts loam (finely sieved)

2 parts well rotted leafmould (oak or beech)

1 part bracken peat (decomposed bracken from local sources)

1 part sharp sand (as sharp as possible even chrushed flint)

1 part Dolomite limestone (for the lime lovers)

Topdressed with granite chippings/bracken peat mix (limestone chippings and bracken peat mix for the lime lovers)

My loam is what is known as Bagshot Greensand and is slightly acid. Were I to move from my present home I would definitely take a bag or two with me.

I never use baled peat in my composts, it is lacking in food value and it's only attribute is that it retains moisture, which the leafmould and bracken peat do just as well - and thay have the advantage of nourishment values.

The newly purchased *Cypripedium*

Preference should be given to *Cypripediums* offered as growing plants, those in pots and looking healthy. Plants offered bare root have had at least one major setback already. Obviously plants sent by post are more likely to be

bare root than in a pot because of the cost of postage. Always buy from a reputable source, from a nursery that has grown the plants on for at least a year. However, to obtain some species this is not always possible and the advice offered is a counsel of perfection. **Cypripediums** should be purchased mid to late Autumn so that when you receive them they are just going dormant or are already dormant. Free the plant of compost (if applicable) by gently teasing it from the roots and immerse the plant in a Benlate mix (as per the instructions on the packet). Shake the surplus away and lay the plant on absorbent paper. Remove any dead roots (black or dark brown) leaving only healthy cream coloured roots. Take care not to damage the growing crown.

Pots and pans

I always use clay pans and never smaller than nine inches diameter or less than four inches deep. Obviously they must be scrubbed clean.

Potting

Having prepared your orchid and the pan, cover the drainage hole with a piece of perforated zinc. Fill the pan to within two inches of the rim with your compost and spread the roots of the orchid on the compost. Continue to fill the pan around the orchid gently pressing the compost with your fingers; never overcompact it. Fill the pan until the growing point of the plant is just below the surface, settle the compost by tapping the pan and if necessary continue adding more mixture. The tip of the growing point must be just below the surface.

Topdress the pan and then stand it in an inch or so of rainwater where it should remain until the compost is thoroughly wetted. Remove the pan and let it drain. Plunge the pan (to it's rim) in damp sand under the greenhouse staging.

Say a prayer!

Feeding

For the first year at least the plant should not require additional feeding, the compost should provide enough nourishment. In it's second and third year half the recommended strength liquid food should be added in it's watering. Personally I use Bio.

Success in growing **Cypripediums** (or any other plant come to that) is not so much a secret or having "Green Fingers" it is simply having common sense. It isn't sensible to purchase a plant with desiccated or damaged roots, this would tax the skills of even an experienced grower. It is also wise to have some idea about the conditions the plant would have enjoyed in the wild and to endeavour to emulate them as best as you can. It's no use trying to grow a **Cypripedium** in a compost that dries and bakes hard, such as suits many bulbs.

It is, of course, easier to control conditions with orchids grown in pans than those grown in the open garden. A far more flexible regime can be adopted when it comes to watering for example. The use of rainwater is always to be recommended but tapwater that has been allowed to stand for sometime will soften. I occasionally top up my water tanks with tap water and I keep half a dozen peat blocks permanently immersed in the tank to assist in neutralising the alkalinity.

During the growing and flowering season the pans are stood on the greenhouse staging and never allowed to dry out, water being given at least every other day and a mist spray (with dilute feed) every evening. If the weather turns 'very warm then the pans are taken outside and placed in the shade of my Bramley apple tree, last year they stood out there for over four months.

By far the best advice I can offer anyone contemplating growing **Cypripediums**

for the first time is to seek out a successful grower and pick his/her brains, learn from their mistakes. Mistakes could take an hour in telling, successes ten minutes!

C.calceolus L

Ladys slipper orchid

Native to Europe and temperate Asia

Height approx. 12 inches

Petals and sepals maroon brown with barely a twist in the petals.

Lip: a baggy pouch rich yellow in colour

Staminode: yellow marked with red

Leaves: large, matgreen, ribbed

The well known but rare native cypripedium now reduced to a solitary, sterile plant in it's native Yorkshire. Widespread throughout Europe whence all commercially available plants originated. Said not to tolerate peat in the compost (as I don't use it I can't comment). It is a lime lover although it will grow quite happily in a slightly acid compost. My own plant, recently obtained at great expense to replace the clump lost in the 1976 drought, is grown in my basic compost with the addition of Dolomite limestone.

C.calceolus var. pubescens (Willdenow)

Yellow Moccasin-flower

Native to N. America

Height: varies from 12 to 24 inches

Petals and sepals green with light brown veining

Lip: like previous Cyp. rich yellow

Leaves: Large, matt green, hairy, ribbed.

Larger in all parts than the preceding plant and the lip can be a clear yellow through all shades, to an orange colour. The hairiness on the leaves extends to the stem also. This is a woodland plant that does not require lime in the compost, plants originating from the Western side of the USA seem to tolerate drier conditions, but never drought. Regular feeding is beneficial and an annual topdressing with leafmould is appreciated.

C.calceolus var. parviflorum (Salisbury)

Small Yellow Lady's slipper

Native to N.E. America

Height: 12 to 18 inches

Petals and sepals maroon brown and heavily twisted

Lip: bright yellow with red spotting within

Leaves: smaller than the preceding variety with less hairiness

Coming into flower slightly later than the preceding plant the flower itself is much smaller. The petals are twisted so that they resemble an old-time barbers moustache. It is a charming plant and has the added attraction of a lovely scent. It needs constant moisture and will not tolerate drought. When happy with it's conditions it will multiply well and is a long lived plant.

C.candidum (Muhlenberg ex Willdenow)

Small White Lady's slipper

Native to N.E. American States South of the Great Lakes region

Height: to a maximum of 16 inches

Petals and sepals greenish brown to brown

Lip: shiny white spotted red within

Leaves: slightly darker green than the preceding species and sheathing the stem.

A delightful little plant with a sweet scent. The lip is about the size of a sparrows egg and is polished white marked within with red spots. The petals are very slightly twisted. It is a lime lover and in the wild grows in full sunlight in damp marly meadows. Carlyle Luer suggests it might need railway tracks nearby to flourish, my local line is about a mile distant, and it flourishes!

C.debile (Reichb)

Shy Lady's-slipper (my name)

Native to China and Japan

Height: probably no more than 6 inches

Petals and sepals pale green

Lip: pale brown and white with a trace of green

Leaves: two, forming an umbrella above the drooping flower

Possibly the tiniest *Cypripedium* and not, by any stretch of the imagination, the prettiest. It's twin leaves hide the flower which starts off in bud above the leaves and then bends to hide beneath them. The plants I have are no taller than 3 inches and while not a striking flower it has great charm when viewed closely. I obtained my plants potted in a mixture of chipped bark, vermiculite, chopped sphagnum and with chalk and charcoal added. As it is doing well I have not changed the compost, although I see no reason why it shouldn't do equally well in my standard mix.

C.montanum (Douglas ex Lindley)

Mountain Lady's-slipper

Native to N.W. America

Height: to eighteen inches

Petals and sepals brown

Lip: white spotted purple within

Leaves: mid green, ribbed, hairy

In 1976 the plant in my garden produced four flowers. It's demise was probably not caused by the heat and drought that year but by the torrential rain that followed and the frosts that followed that in early Winter. The wet followed by frost caused the crown to rot. I obtained another plant in 1988 and my benefactor gave me explicit instructions on how it should be grown. It seems that this plant will not tolerate wet around the crown, but it does need ample moisture at the root. He demonstrated this by showing me his plants. The top four inches or so of "soil" was dry, sandy, dusty dirt in which sat the crown of the plant. Beneath this top layer was moist, rich leafy mould in which grew the root system. How does one duplicate these conditions?

Firstly, take a deep pot (12 inches), place the roots vertically into the pot and fill with standard compost until it is six inches or so deep, until it just reaches the base of the crown. Continue filling to within an inch or so of the rim with a mixture of sand (I use Cal-Val) and sieved leafmould, in a proportion of 10:1. The tip of the growing point should be an inch or so below the surface. Plunge the pot in damp sand to the level of the lower compost (6 inches) and surround the projecting part with a polystyrene collar, to protect the crown from Winter frosts. Keep the plunge material damp. Obviously the collar can be removed during the growing and flowering season. So far it's worked. This may seem a lot of bother to go to, but to see this beautiful plant in flower makes you realise how worthwhile it is. I have no intention of losing this plant again.

C.cordigerum (Don)

Native to Kashmir, Himalayas

Height: to eighteen inches

Petals and sepals green tinged white

Lip: white marked within orangey red

Leaves mid green, with lustre, non hairy

C.cordigerum looks, superficially, like it's N.American cousin **C.montanum**. The difference being that the petals are not brown and the leaves are lustrous rather than matt and pubescent. It takes kindly to cultivation and like most of it's cousins detests being dry. One well known British grower has grown the plant well for over sixteen years, during which time it has multiplied, filling a twelve inch pan. A kindly benefactor replaced my lost plant this year and I look forward to seeing it in all it's glory in a year or so. **C.cordigerum** does not seem to mind the addition or absence of lime in it's compost, just so long as it's "leafy".

C.japonicum var. *formosanum* (Thunb)

Native to Japan, China and Taiwan

Height: to fifteen inches

Petals and sepals white with red spotting radiating from the base

Lip: large, bloated, white suffused with red dots and dashes

Leaves: twin leaved which are fan shaped, from the centre of which emerges the inflorescence. Matt mid green, downy.

A lovely orchid and quite the easiest to cultivate. The perfect plant for the beginner. The root system is different from most other Cyps. in that it is a tough, wirey and cane like development. From the tip of each "cane" (which branches) sprouts a growth point. The root should be planted deep in the pan and the compost used should contain more leafmould than has been advocated for other Cyripediums. This orchid increases well and seems to prefer to send it's

new roots to the sides of the pan, so that the flowering stems emerge around the outside edge rather than in the centre of it. The type plant (*C.japonicum* var. *japonicum*) is not as easy to cultivate in my opinion, but as it is seldom available this shouldn't present a problem.

C.reginae (Walt)

Queen Lady's-slipper

Native to N.E. to Mid West America (State flower of Minnesota)

Height: to 30 inches

Petals and sepals broad, white

Lip: large, inflated and deep pink

Leaves: mid green, downy

The Queen Slipper is aptly named, it is indeed a regal looking plant. The late Eric Young had a photograph of this plant growing in an American forest and the forest floor was as thick with this magnificent plant as an English woodland is with our Bluebell. It was a photograph I will never forget.

My own plant, lost in 1976, increased from a single crown in 1972 to twelve in that fateful year. It is perfectly amenable to pan culture, again with extra leafmould in the compost and never being allowed to dry out. All *Cypripediums* are beautiful but this one must rank as a strong contender for being the most beautiful.

C.acaule (Aiton)

Pink Lady's-slipper, Pink moccasin flower

Native to N.E. America and into Canada

Height: to 12 inches

Petals and sepals green suffused brown, slightly twisted

Lip: pink with red veining, drooping

Leaves: usually two at the base, bright green and ribbed

Not too dissimilar in flower shape to *C.japonicum* var. *formosanum*. It too requires a compost rich in well rotted leafmould but, I feel, it is not a long lived plant in cultivation. I grew four pans of this plant and for six years they did well and increased each year. In 1984 all four panfuls failed to show, examination of each pan revealed no trace of the deceased plants, as though they had never existed!

C.bardolphianum (W.W. Sm)

Native to Kansu, W. China

Height: probably no taller than four inches

Petals and sepals pale green

Lip: orange and covered in small warts

Leaves: mid green (matt) two or three

For me a newly aquired plant and one that I have not yet flowered. The description given is taken from Darnell and I trust it is accurate. It seems happy in my standard compost and I am hopeful of results.

C.margaritaceum (Franch)

Native to W. China

Height: 2 inches

Petals and sepals greenish yellow spotted with purple

Lip: yellow spotted with purple and covered in glandular hairs

Leaves: two, at ground level. Deeply grooved and covered in liver toned spots which fade as the plant ages.

Allegedly a lime lover, so that's how i've treated it. Of the six plants purchased only one, it appears, has survived. I would state however, that the

plants arrived bare root and already into growth and attenuated. Not the best of conditions to start with. It could be an expensive way of learning. My one healthy (?) plant formed a flower bud but this aborted. Ever the optimist I look forward to it flowering next year when I hope it will look as fantastic as the photographs of it in the AGS Bulletin (Vol. 56, 1988 page 249) and in Phillip Cribb and Christopher Bailes book.

In conclusion

There are other *Cypripediums* I have grown (and lost) and which I will not try again. There are many others I would like to grow that have so far eluded me, such as *C. passerinum*, *C. californicum* etc.. Oh that I could try *C. irapeanum*!

The advice given may not be what other experienced growers would agree with, they may be equally successful using totally different techniques. The regime I have adopted has worked well for me over many years and I see no reason why it shouldn't for other people. Most of my *Cypripediums* have been with me for over twenty years now and still thrive.

NORMAN HART, Wokingham.

BE CREATIVE

The first *Pleiones* were brought into cultivation well over a hundred years ago. They were collected in India and aquired the name 'Indian Crocus'. Obviously the *Crocus* and *Pleione* flowers are quite different to one another but the bulbs and pseudobulbs behave in a similar manner both being of annual duration. Although *Pleiones* flower from the side or base of the pseudobulb I have read accounts of them flowering from the top in the same way that *Crocus*

do.

Because the Indian species were the first to be introduced into cultivation and flower in the Autumn before going dormant, the misconception has arisen that all *Pleiones* should be re-potted after flowering. If Spring flowering plants are re-potted after blooming, damage to the new roots will almost certainly be caused and a subsequent loss in vigour during the following season will be the result. Re-potting should only be carried out during the dormant period which is normally December/January.

For a long time only a few species were recorded and for a while were grouped with *Coelogyne* but were later recognised as a separate species. When plants were introduced from China and Formosa (Taiwan) some years later the number of species in cultivation doubled. To the best of my knowledge, no increase in the number of species in cultivation was recorded until 1981 when Roy Lancaster returned from the Anglo-Chinese expedition with *P.forrestii* and *P.yunnanensis*. Since then several new species have appeared.

It was already suspected that the plant cultivated for many years as *P.forrestii* was in fact a natural hybrid. Further research has proved this to be correct and it is now properly known as *P.x confusa*. Plants formerly known as *P.yunnanensis* and *P.pogonodioides* have now also been properly recognised as *P.bulbocodioides* and *P.speciosa*.

Up until the late 1950s, no hybridising of *Pleiones* had been recorded, but in 1962/3 in France, Professor Morel flowered *P.Versailles* and although only a few people realised it a whole new world of *Pleiones* was about to open up. Roy Williams re-made the Versailles cross and the very successful clone *Bucklebury* came into being. It was awarded a F.C.C. by the R.H.S. A few other *Pleiones* have received awards since but I am sure there are now many that deserve to receive this distinction.

Most types of flower hybrids owe a lot to amateur growers and I think many of the future good Pleione hybrids will be raised by amateurs. If anyone feels like tackling the very pleasant task of raising their own hybrids here are a few points to consider.

Reference to the 'Genus Pleione' or 'Butterfields Pleiones' catalogue will give the parentage of many of today's hybrids. This gives the chance to repeat the crosses or to avoid them and try something entirely new. A species crossed with a species will result in fairly uniform flowers from the seedlings. A species crossed with a hybrid will result in flowers with similar characteristics to each parent and several in between. The greatest diversity in flowers is when the cross is between two hybrids, when shape and colour changes may be expected.

Now you have looked at your plants and have decided on the cross that will give you the 'Special' you have always imagined, pollination is the next step. It is preferable but not essential to use the strongest grower of the chosen parents to be the seedbearer.

Collection of pollen is easy enough and fertilising one plant at a time avoids any confusion between crosses. As the pollinia come in two pairs, it is possible to make more than one cross from a plant, in fact pollinia may be cut into halves so that a single pollen parent can fertilise up to eight flowers. Always handle one set of pollinia at a time and work with them on a piece of clean paper. Using a pointed matchstick or something similar, push the pollen cap to one side - this usually results in the cap coming off with the pollinia still inside it. The same stick can be used to pick up one of the pollinia for deposit onto the stigmatic surface.

The column bends downwards to the base of the lip normally within twentyfour hours of fertilisation and the flower fades after a few days. Make a note of the cross and the date of fertilisation on a plant label and place it in the

pot of the seedbearer with a tie around it and the flower stem. When the seed-pod has developed it may be fat or thin but either or neither may contain viable seed. Approximately 150 days after pollination the seedpod may be taken from the plant and sent to the laboratory to be grown in sterile flasks. The Lab. keeps them growing for a year or so after which time they are returned to you with the young plants in growth, but placing them in a light cool position will soon result in them browning off and becoming dormant. Only when they have reached dormancy should they be removed from the flask and potted or put into trays. Do not plant the small bulbils singly but in clumps of ten or so, they seem to grow better this way. Keep them growing on until flowering size is reached, normally in three or four years. The odd few can take a lot longer but even with these late developers, once flowering commences flowers can be anticipated each year.

If one of the hybrids produces a good flower with a noticeable difference to it's parents it could be well worth while registering the cross with the R.H.S. Only hybrids raised from registered crosses may themselves be registered.

I hope after reading this that you will be encouraged to try some hybridising of your own and that you may even be inspired to try growing the seeds yourself.

PETER BRADBURY, 72 Blind Lane, Bourne End, Bucks. SL8 5LA.

GROWING PLEIONE AND OTHER ORCHIDS FROM SEED

The growing of orchid seed is a simple straight forward laboratory type procedure, relying on adherence to good practice for an acceptable success rate from viable seed. Briefly the method consists of sterilising the outside surface of the seed or seed pod before placing a small quantity onto the surface of sterile nutrient medium within a suitable clear plastic or glass container, all steps being carried out in clean air conditions using aseptic techniques.

Before outlining an actual seed growing method perhaps we should first look in more detail at each of the factors, which correctly put together will spell success.

SEED Pleione pods mature in some 6-7 months other genera take from 3-14 months, they can either be left on the plant to maturity or taken off as green pods a few weeks earlier, mature pleione pods go deep brown in colour, other genera can turn yellow all eventually split and shed their seed on maturity, this is the almost inevitable fate of that special cross you have been nurturing all year, pods from unsuccessful attempts at hybridisation are usually shed by the plant at half to three quarters of their expected life span, pods going to maturity do not necessarily contain viable seed, viable seed falls from the pod in the manner of lead shot. Chaff is noticeably lighter, chaff is always worth sowing as one can sometimes get a few plants from the most unpromising looking pod contents. In the laboratory the essential difference in handling pods and seed, is that the inside of an intact pod is sterile, so one treats the outside of the pod before cutting open to remove the contents, whilst harvested seed is assumed to be contaminated with fungal spores and bacteria, and the seed itself is sterilised. The advantages of green pods is that all your years flas-

king can be done in one batch, it is also of use in producing viable pods from 'wide crosses' made between parent plants that are not closely related, these pods are harvested very early in their life, often after a few weeks, before nature activates its rejection mechanism, and the contents placed onto special nutrient media for growth.

Seeds and pods after harvesting should be stored in a cool dry environment, wrapped in paper, plastic in any form should be avoided at all costs, as the seed will go damp allowing fungal spores to germinate and the mycelium to quickly grow throughout the seed rendering effective sterilisation impossible, given similar conditions sound green pods can go brown and mushy in 2-3 days. When posting seeds or pods remember that overgenerous use of sellotape has a similar effect and many 'Jiffy' type postal bags are plastic lined.

Unless firm arrangements have been made, seed sent to a third party for germination should be coded, nothing embarrasses him more than to find someone else has made the same cross and is advertising them for sale. Orchid pods should of course correctly be called Capsules.

ORCHID MEDIA The first published formulae were by Dr Knudsen in 1922 although now largely superceeded by his formula C (1946) with the addition of banana pulp is still capable of giving acceptable results with Pleione. Orchid media contains the basic plant nutrients and trace elements together with a buffer which is added to try to stabilise the pH at around 5.5 to 6.0 but this can be reduced to as low as 3.0 by the developing seedlings. In nature sapophytic fungi (RHIZOCTONIA) break down plant proteins to simple sugars which act as a carbon source for photosynthesis, media therefore contains a sugar normally sucrose, glucose or fructose or a combination from these, the medium is made solid with agar added to a strength which just makes a gel without being over

firm, modern agars are much purer so the amounts stated in original formulae can often be nearly halved, modern media also includes a variety of auxins and other growth promoting substances at concentrations as low as 1 PPM, too much is toxic, too little is ineffective, media produced in small quantities can and do give batch to batch variation, even persons producing large quantities of flasks of orchid seedlings find it more convenient to buy their media from specialist producers.

Some years ago researchers analysed rain water running down the trees in South American rainforests and found it remarkably close to the Knudsen formula, one can imagine wild fluctuation in the nutrient levels depending in the proximity of the local fauna.

CONTAINERS To be suitable for use for seed raising, must be clear walled and capable of being sealed either with a cap or rubber bung, usually containing a breather tube with a nonabsorbant cotton wool filter, glass containers should be 'Pyrex', soda glass releases alkali into the media to lethal levels, this was a common cause of failure in the early pioneering days, acid washing and phosphated glass are surface treatments which merely delay the inevitable. The ideal glass container is probably the wide necked Erlenmayer flasks in 250 and 500cc sizes used in conjunction with an appropriately sized rubber bung. For Pleione the 250cc is adequate, bigger taller growing genera such as cymbidium require the larger size, baby food containers and the square glass juice containers from supermarkets are alternatives which might be considered. In plastic a number of containers in the Sterilin range are suitable, the 60 ml is particularly useful for seed growing, with the 150 and 250ml size being used for replating also worth considering are the larger sizes of Tissue Culture flasks from the same firm, all these come sterile and cannot be reused.

Replated seedlings do not grow as well in plastic containers as they do in glass, this could be due to plasticiser leaching into the medium or the fact that the top is totally sealed or a combination of both, one of life's mysteries is where the water from the media goes to in a plastic container, but after a few months the media becomes noticeably shrunken and dehydrated. The solution is either to risk contamination by opening the container and adding sterile glucose water, or one can achieve the same effect by adding about 40% more water when making up the media, the correct levels of nutrients gradually being reached as the water disappears, in this case one does of course have to add proportionately more media initially to each flask, polycarbonate containers which are resterilisable are widely used in plant tissue culture laboratories but do not appear to have caught on for orchid seed raising in this country, flasks of seedlings in these are advertised by one or two overseas firms. Unsterilised but dissolved and well mixed media is dispensed into glass containers, with plastic the media is first sterilised and then distributed under aseptic conditions.

DISINFECTANTS Although not a good disinfectant, alcohol or methylated spirit is useful for wiping working surfaces, and for aerial spraying in a glove box to create a sterile environment. For seed and pod sterilisation chlorine is the sterilising agent of choice, and is prepared by mixing 10 grams of calcium hypochlorite in 100ml of water, allowing the insoluble solids to settle, using the clear supernatant fluid, more recently tablets of SODIUM DICHOROISOCYANURATE have become available, one 0.5gm tablet in 300cc of water gives 1,000PPM available chlorine in the solution and there are no undissolved solids to worry about, techniques using hydrogen peroxide as a sterilant have also been described, in these the seed-peroxide mixture after 5-10 minutes is dispersed

direct into the flasks, sounds a simple straightforward exercise, but there must be snags in that the method does not appear to be widely used, at least I have yet to meet anyone who admits to using it. A word of warning, these solutions are all bleaches and contact with mouth and eyes should be avoided. HASWA (Health and Safety At Work Act) and COSHH (Control Of Substances Hazardous to Health) apply equally to the home. Spillages will cause pale white patches on clothing and carpets, it is usual to add a wetting agent to sterilising solutions, 2-3 drops of Tween 80 is ideal, Fairy Liquid is also acceptable, some detergents are phytotoxic so some experimentation might be in order if these two are not available.

WORKING ENVIRONMENT For maximum success sowing operations must be carried out in sterile or near sterile environment, larger operators invest £1,000 or more on a laminar flow cabinet, much cheaper alternatives are available to the person who only occasionally processes a few flasks. The kitchen oven after cooking or baking and allowed to cool with door closed has a sterile interior. Working over a pan of gently boiling water gives an updraft of near sterile air suitable for processing flasks, too many flasks though and you get to redecorate the room as well, a simple open fronted box of clear perspex can be sprayed inside with a disinfectant to sterilise and frequent respraying to maintain sterility is recommended. Large new unopened plastic bags have a sterile interior, cut the corners off the bottom to fit snugly over the flask necks and work from the open end. In all cases one should work in a draft free room with the windows and doors closed, if there is a chance of someone entering the room whilst working with the flasks, lock the doors.

GOOD ASEPTIC PRACTICE Under this heading would come such obvious items as not

handling the necks of the flasks, as removing the stopper or cap from the flask causes a minor implosion of air from around the neck into the interior of the flask, not working over the top of opened flasks, avoiding drafts, keeping the working environment sterile, wearing thin rubber or plastic gloves which can be wiped with disinfectant to sterilise. The top of flasks should be covered with tinfoil to protect the neck area, when glass flasks come out of the autoclave or pressure cooker, they are sterile, inside and out, if we are not using them almost immediately then store them upright in a stout cardboard box lined with a large new plastic bag, which is secured at the top before closing the box, plastic containers are sterile when they are manufactured and are capped and packed by the makers under clean air conditions, they should receive the same care. If you are planning to replate the seedlings, then the containers used for germination should be incubated in a plastic bag, we use a piece of stout cardboard as a base within the bag, this secures the flasks in an upright position.

PREPARING FLASKS Dissolve the orchid agar in the correct amount of water (preferably distilled) and completely dissolve by gently heating, boiling should be avoided as it can cause the media to erupt from the flasks, then if you are using 500ml glass flasks dispense into about eight flasks per litre or (12x250 ml flasks) . These are then loosely capped or bunged, tops covered with tinfoil and autoclaved or pressure cooked at 15LBs pressure for 15 minutes, if you are using plastic containers then the media is autoclaved in 100ml quantities and dispensed into the containers under aseptic conditions when it has cooled sufficiently for it to be comfortably handled. Care should be taken when dispensing media into the flasks to avoid getting medium onto the inside of the neck which when sealed with a bung will give a thin film of nutrient material for

contaminates to grow down into the flask from the outside. Bottles of sterile water will also be needed to work the seed and are prepared in the same manner. Flasks for seed germination normally have a plain media. For replating, add one well macerated banana per litre of media. In replating, a small number of plantlets are moved and replated into a new flask of enriched media and grown on for the final 3-4 months until they are ready for removal and potting up.

A METHOD FOR SEED SOWING You will need:

Prepared Flasks

Small Funnel

Course Filter Paper (coffee filters cut to size O.K.)

Spatula (8" Chattaway)

Sterile Water

Methylated Spirits

Spirit Lamp or small Gas Burner

Timer

6 x $\frac{1}{2}$ Test Tube with stopper

Wetting Agent

- (1) Using boiled and cooled water make a solution of sugar - the concentration is irrelevant, to this add one or two drops of wetting agent.
- (2) 2-3cc of this solution is placed in a test tube, a small quantity of seed is added, this is then thoroughly mixed and left at room temperature for 12-24 hours, thus germinating resistant bacterial and fungal spores into the vegetative state which is more easily sterilised. It also thoroughly saturates the seed helping to restrict the action of the sterilant to the outer surface.
- (3) Add 3-4cc of freshly prepared bleach solution ensuring that the inside of

the tube neck is wetted, then seal tightly with the bung, mix thoroughly and immerse the top bung end of the tube briefly in the sterilising solution, leave for about eight minutes, mixing two or three times in this period, as the seed has been presoaked sterilisation times of up to fifteen minutes or more will not have adverse effects, from here on all steps take place in the sterilised clean air environment.

(4) Within this environment place the filter paper in the funnel which itself is placed in the aperture of the container which will collect the sterilising fluid and wash waters passed through the funnel, loosen bungs of those flasks of media you wish to sow, sterilise one end of the spatula by dipping in alcohol or methylated spirit and flaming.

(5) After eight minutes mix again the seed solution and pour into the filter paper, add some sterile water to the tube to remove any remaining seed and pour into the funnel and finally pour a further lot of sterilised water through the funnel.

(6) Open flat the filter paper on the sterilised surface of the working area, tilt a flask at 45° , remove the bung, place this upside down within the covering tinfoil, using the previously sterilised spatula rescrrape some of the seed from the filter paper and place in the condense water at the base of the media in the sloped flask, restopper and gently swirl the flask to distribute the seed over the surface of the agar.

GREEN PODS Are handled by first removing any flower remnants from the distal end of the pod, then using a stiff tooth brush, soak and scrub the pod with the hypochlorite/wetting agent mixture, leave for ten - fifteen minutes, then in the sterile environment using a sterile scalpel or single sided razor blade cut a section out of the side of the pod to expose the interior, if loose seed

is present, use the spatula to place some on the surface of the media, if no loose seed is present, then cut the interior of the pod free and place into the flask, always sow more flasks of seedlings than you require to allow for losses.

For maximum growth rate incubate the flasks at about 68-70°F (20-21°C) and one can with advantage extend the day length to eighteen hours by suspending fluorescent lighting twelve inches above the flasks. If planning to replate seedlings after germination, use smaller, say 60ml containers and sow much more thickly than would otherwise be the case, when the amount of seed should be less than half that you think is insufficient which is an untechnical way of saying sow very thinly indeed, or you will end up with a large number of poorly developed weak seedlings. When replating you resterilise the outside of the seed germination containers by immersing the whole in sterilising solution and use the sterilised and cooled spatula to remove about twenty protocorms to the new flask evenly spacing them over the surface. Seedlings with roots can with advantage have these carefully pushed into the surface of the media in the flask.

Pleione protocorms frequently form a dense mat bound together by their root hairs, when this happens one has to transfer two or three small clumps of protocorms to each flask.

Nobody achieves 100% success, but a failure rate of more than 1 or 2% should cause one to examine ones techniques. Surface contamination comes in with the seed, and contamination throughout the medium indicates defective media sterilisation, some batches of bananas currently coming into the country contain a very resistant spore organism, so note which island your bananas come from and if you have any problems try a different producer.

It is possible with care to sterilise your media in the domestic oven, one

colleague of mine swore by the method until the day, experimenting to increase growth rate he used bananas, these foam in unpressurised dry heat and the media literally exploded out of the flasks, the resulting incredibly filthy state of the oven being only matched by the temper of his wife, so play safe stick to the pressure cooker.

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Media and Containers

ROY BARROW, 'Royden', Perks Lane, Great Missenden, Bucks. HP16 0JD.

FROM FLASK TO FLOWER

Growing *Pleione* seedlings from the flask is quite easy, although a lengthy process. It usually takes four years from making the initial cross for the first flowers to appear, but it can take as long as twelve so patience is a virtue.

The seed pods go to the laboratory in August or September and the seedlings are not returned until the following season in November or December (16/18 months) whilst still in growth. They are left in their flasks on a shelf in the greenhouse in full light so that they eventually go dormant. The temperature in the greenhouse will be 35°-38°F. (1.5°-3.5°C.) during the night but higher in the daytime with sunheat of course.

By mid January they will just be starting to grow, but with no live roots yet. This is the time to remove them from their flasks. The tiny bulbs are washed in a dilute solution of liquid copper or other fungicide. Do not use Benlate as this can make the bulbs go dormant.

The compost for seedlings must contain plenty of air but must also be capable of holding moisture. The compost which I have used successfully for the base of the pans is :-

- 5 parts medium grade orchid bark
- 3 " chopped sphagnum moss
- 2 " fibrous peat
- 2 " shredded oak or beech leaves
- 1 " coarse Perlite
- 6 " water repellent rock wool.

The top $\frac{3}{4}$ inch of the pans are surfaced with a compost of :-

- 2 parts chopped sphagnum moss (FRESH)

1 part pine mould

1 " water repellent rock wool

and the tiny bulbs are inserted in this. They usually come out of the flasks in quite large clumps, but are carefully separated into much smaller clumps of five or six bulbs which are inserted about 1/4 inch apart. There is no need to separate them into single bulbs as they appear to like growing close together.

Try to keep the compost in the pans just moist, letting it almost dry out between waterings. When the bulbs are growing strongly they can be fed with a dilute solution of a balanced liquid feed containing trace elements, about once a week. They also need shading from the sun in the Summer, and spraying overhead in the evening after hot days. In fact treat them as all the mature bulbs are treated.

During the first years growth it is almost certain that losses will occur but this is nature's way of getting rid of the weakest seedlings. As the compost used on the surface of the pans is rich in humus, it is likely that moss (scarid) flies will make an appearance. These can be controlled by placing insect eating plants such as *Pinguicula caudata* amongst the pans, or if the flies are very numerous by spraying with an insecticide.

The bulbs will go dormant when all the other Pleiones go dormant in the Autumn. They should be kept cool for their Winter rest - around 35°F. (1.5°C) until they are cleaned and repotted in January. When cleaning the tiny bulbs be careful not to throw any away with the old compost. If the bulbs have grown appreciably in size they can be repotted using the coarser compost only, but if they are still quite small repot them using the finer compost on the surface.

Some crosses will grow very vigorously and increase well while others will increase only very slowly. These are usually back crosses but it is not a hard and fast rule.

IAN BUTTERFIELD, Harvest Hill, Bourne End, Bucks. SL8 5JJ.

SOMERSET REPORT

The season has produced a very good crop of flowering size pseudobulbs but in spite of the unusually fine summer weather mine are not as large as usual. Maybe I didn't water them often enough in the long dry periods. However they have produced flowers on smaller bulbs than usual and I put this down to there having been more light to ripen the bulbs. Another unusual occurrence this season was that quite a number of flower buds turned brown on the point of opening and aborted. This again I presume was due to the milder, drier Winter and failure to keep the compost sufficiently moist as the flowers developed - one is always afraid of overwatering in the early stages of growth.

The bulbils planted in water repellent rockwool reached flowering size in their second year and I intend to continue comparing this medium with bark based compost. It certainly does not attract moss flies and their larvae or slugs. As rockwool is inert, feeds must contain all the necessary elements for the growth of Pleiones plus of course the necessary trace elements. A suitable feed can be obtained from Greenaway Nursery, Nye, Hewish, Weston super Mare.

Last season I tried using some of the sieved bark compost from the previous year mixed fifty fifty with new compost and noted little or no difference with plants in all new compost. I haven't continued the idea this year, having been warned of the danger of passing on disease and/or virus.

As one might expect the most vigorous and prolific of the Pleiones are the hybrids. Among my collection **Eiger** and **Tolima** have proved extremely prolific with fine flowers, especially **Tolima** holding its flowers proudly on firmly erect stems. My favourite flower is undoubtedly **Rakata**, the largest and most beautiful with mauvy-pink tepals with a network of deep brick red on the fimbriated lip and four bright yellow keels. I have just measured one five inches

across with the lip two and a quarter inches long. Although it is not so prolific as some hybrids it produces very large bulbs - polyploidy?

Conservation of species is very much in the news at the moment and our native orchids are disappearing at an alarming rate. Within a square mile of my home one used to be able to find seven species, some in quite large groups. Last year I could only find three of these and quite thinly scattered. We hear of efforts being made to germinate seeds of our native orchids for flasking and distribution to suitable growers. I am sure a number of dedicated Pleione growers would be happy to take part in such a scheme - they can certainly provide the right habitat.

We all owe a debt of gratitude to Peter Bradbury for producing the National Pleione Report. As each new season approaches it becomes increasingly difficult to find something new to include in a decent length article. The article on hardy bog orchids in last years report was a welcome addition; can we have more on hardy orchids and what about including a sales section for amateurs to sell or exchange their surplus pseudobulbs? We mustn't let this useful publication die through lack of support.

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Thankyou for your appreciation of the N.P.R. Ivor, i'm pleased to say a few other people have made similar remarks.

It's true what Ivor says folks, if contributions don't come in I can't compile them into a report. We should all be grateful to all the contributors to the report for their generosity in writing and sharing their knowledge with us.

I will do my best to obtain articles, but you must be prepared to contribute if you want the report to continue. It's not as difficult as you think to write a piece about your favourite plants, why not give it a try?

If anyone is interested in Sales or Exchanges I will organise a photocopied list of all people wishing to take part. I would need details of all you have to offer by 1st November so that I can circulate the list in time for the dormant season. I think 50 pence will be sufficient to cover the cost of doing this. Once you have the list it will be up to individuals to contact one another.

PB

PLEIONES ON THE PENNINES

"THE LAST CHANCE"

The above subtitle may seem alarmist on first reading, but I find myself realising that in not too distant a future certain Pleione species will be lost to us in cultivation in the U.K. This is due to our failure to understand the plants requirements and assuming far too much about our understanding of their needs.

A recent export ban imposed by the Indian authorities on it's plant material means that we will have to propagate instead of importing plants. **Maculata**, **praecox** and **humilis** grow reasonably well and flower, but it is **hookeriana** that is causing concern to growers from the Indian section of this genus. It may become the ghost of many greenhouses in a few years, only empty husky shells will remain, SO WHAT WENT WRONG?

I have two old books dated 1927 and 1929 that make reference to **hookeriana** and **lagenaria**. The points of interest being an intermediate temperature of 75°F (24°C) with 60% humidity is required for their growing season and a short dry Winter period for **lagenaria** and a cold six month period for **hookeriana**. The natural hybrid may have survived due to hybrid vigour, but if these guidelines were followed where is **hookeriana** now?

So it's back to school for all of us, no one has got the answer, this includes Kew and the R.H.S., or have they? Scotland grow their **maculata** warm and flower it each Autumn.

Keith Rattray grew all of his *Pleiones* in a plunge bed. The Indian types were growing in a warmer corner of his greenhouse with positive results. He noted that the root systems were not over vigorous in the Indian types when compared to the Chinese *Pleiones*. He never had leaf tip neurosis growing his plants this way. They all grew and flowered. Did they absorb the moisture from the atmosphere like the vandaceous material? He thought so, and he noted that certain types of *Pleiones* grew more easily in Scotland than in the South of the country. He had longer Summer days than London had.

Hookerianas native Winter months are cold, but they are protected from dehydration and frosts by the mossy material in which they grow. The growing season is short, but the days are hot, humid and long.

I noted by accident that **hookeriana** flowered and grew when subjected to high temperatures and humidity when a friend of mine was looking after my orchids for me. She didn't ventilate; when I returned I did, I reduced the temperature and humidity along with my stocks of **hookeriana**.

Praecox and **maculata** respond to such conditions, so in future all three will be given these conditions, warmth, light and humidity. **Praecox** responds to warmth and flowers well in a bright Autumn.

Humilis I think requires a cool summer period, as last year it didn't grow very well. In cool, dull Summers it produced first class results. Fortunately I made several hybrids using **hookeriana** so all may not be lost. The hybrid **hookeriana** x "**Irazu Cheryl**" shows very strongly the influence of **hookeriana**. The bulb shape and bud location are very similar to the species growth, when we flower them this Spring we will know if the influence is carried through to the flowers. This hybrid grows well, it was made in 1986 and produced some thirty plants. The hybrids made using **Vesuvius** and **Asama** are slower growing, but acceptable. These we will expect to flower in 1991.

Over the past few years the ratio of hybrid material to species has increased in my collection, so has the average growing temperature in my greenhouse. This has meant that the hybrid material has grown very well while the Chinese **Pleiones** have shown signs of degeneration. The hybrid material, **praecox** and **maculata** will be moved to grow with the **Laelias** and **Encyclias** that I have, while the Chinese types will be grown in a cooler situation. **Forrestii**, **coronaria** and **humilis** may grow more positively.

The hot Summer of 89 proved very difficult for growers and plants, many plants stopped growing during the hot periods. The plants went on growing into the late Autumn to make up for the lost growing time, most made good growth and good sized bulbs with fat flower buds. Fortunately it was a mild Autumn - had it not been many bulbs would have been small and non flowering size.

The most pleasing result of the high temperatures and humidity levels was the lack of the leaf tip neurosis, was this the result of the high humidity etc?. When Autumn came, the temperature and humidity dropped and the leaf tips began to show signs of problems. This didn't prove to be a problem as most plants were near to maturity.

Several experimental composts were tried last season, some using rockwool type materials. This material produced many problems when exposed to high

temperatures, humidity and light levels. Algae grew very well in it and into the roots of the plants and this caused problems which ended in the roots dying. I'm not going to use this material any more.

Meristemming has proven to be unreliable for the mass propagation of selected Pleiones. Many of us are thankful for this situation, this would have reduced the value of most Pleiones and increased stocks to a level where no one would be able to produce new hybrids and make a profit. In the case of the Pleione it is up to the professionals and those who have access to the best and rarest materials to produce the future hybrids.

Most seedlings take five years to mature from the date of crossing and cost at least £10-00 each to produce, so any massive increases of selected stocks would reduce the name cloned material to a give away situation, or even worthless.

There is a method of clonal propagation that myself and a friend are working on. This method stimulates all basal and apical material. The work is promising and documented. The returns are good, typical 4.7 : 1 pieces of vegetative material, normal returns are 2.8 : 1 on average. This will produce good clones at a fair price, and not reduce the other material to a rock bottom situation.

Good growing

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