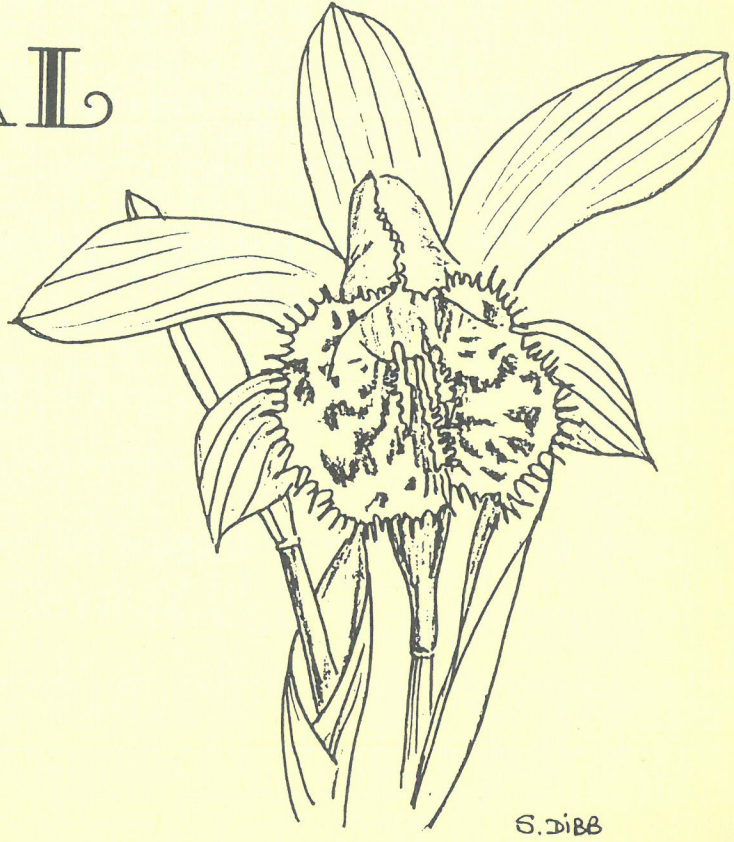
1991

NATIONAL PLEIONE REPORT

INCORPORATING

HARDY ORCHIDS



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HARDY ORCHIDS

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Epipactis Palustris and rear cover illustrations by Norman Hart

Report compiled and produced by Peter Bradbury

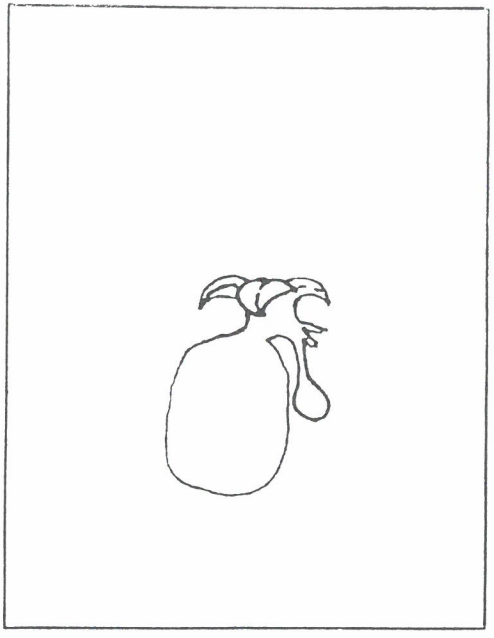
CULTIVATION OF EUROPEAN TUBEROUS TERRESTRIAL ORCHIDS

Few plants have such capacity to enchant us as the terrestrial orchids in the genera **Ophrys, Orchis, Aceras** and **Serapias.** Few plants are more uncompromising in cultivation. The reason for this is that few species reproduce vegetatively and one tuber will produce one flower-spike and one new tuber before whithering away itself. If the new tuber is harmed in any way the plant cannot survive into the following year. The would-be grower must understand a little of the orchids life below ground as well as their clearly-visible leaves and flowers.

Cultivation developed at Kew during recent years places emphasis on the orchid's natural relationship with fungi which provide it with at least some of the nutrients it needs. The method discussed here aims to grow the two organisms together in balance.

Terrestrial orchids are likely to become much more readily available from nurseries in future as techniques for raising them from seed, which have been developed by the Sainsbury Project at Kew, are exploited by nurserymen. Many species are threatened in the wild by habitat change and by collecting, much of which is illegal. I would be very sorry if publication of this article lead to further depletion of wild plants by people wishing to make collections in cultivation. Please leave the plants where they are for everyone to enjoy and encourage those nurseries adventurous enough to try growing them from seed.

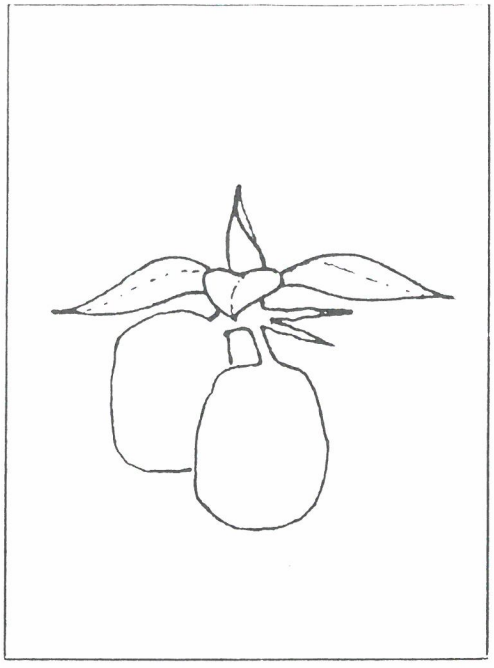
The following sketches and notes illustrate the life-cycle and cultivation of orchids in the genera **Ophrys, Orchis, Aceras** and **Serapias.**



Mid-September until mid-January

1. Growth of rosette and development of new tuber.

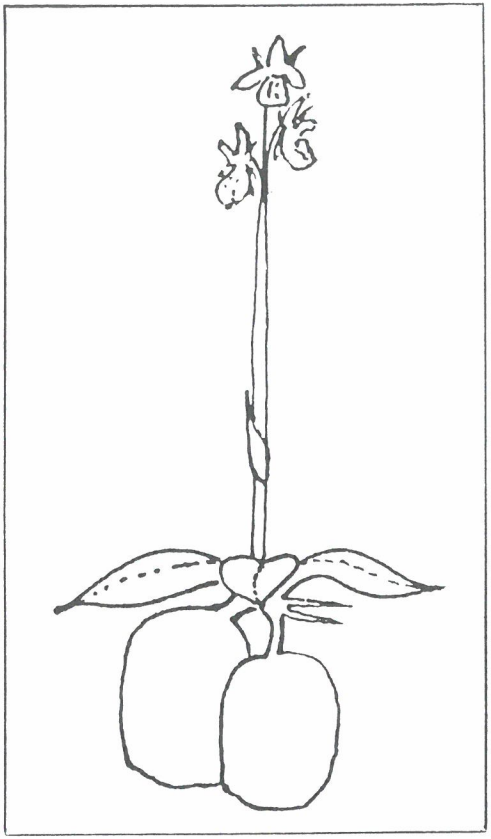
Conditions: frost-free glasshouse or frame with sunny aspect. Good ventilation and as much air movement as possible.
Watering: the compost should be damp at all times without being allowed to become sodden. Drying out of the compost will interrupt development of the mycorhyzal fungus. It is preferable to water around the edge of the pot so that water does not flood into the rosettes. By watering early on sunny days it is possible to ensure that any water accidentally spilled on the foliage evapourates before night.



Mid-January to flowering

2. Rosette and new tuber fully-formed, flower bud visible

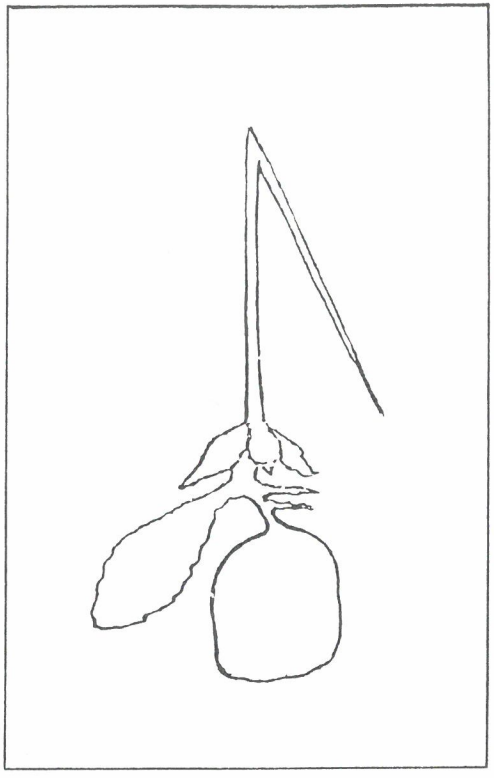
Conditions: as 1.
Watering: reduce water substantially and allow compost to become drier between waterings. Dry down to 1" is a good guide. Overwatering at this stage is probably the commonest cause of failure and leads to rotting and death of the new tuber. It is not possible to diagnose this misfortune from the foliage, it will only become apparent when repotting in the Summer. After a couple of weeks with less water, the foliage will begin to look tired. Temptation to save the foliage by over-watering must be resisted.



January onwards

3. Flowering.

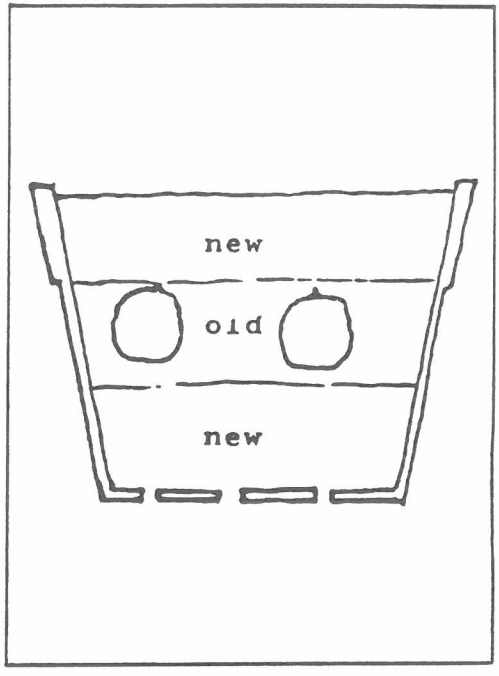
Condition: as 1, with addition of about 40% shade by mid April just to slow down temperature gains and prevent over-rapid dessication of the foliage.
Watering: allow compost to dry out down to 1½" between light waterings. Care must be taken to ensure that water does not lodge in the foliage as Botrytis can spread back to the new tuber.



End-April to end-August

4. Dormancy.

Conditions: as 3.
Watering: although the tubers are dormant some water is needed to prevent any shrivelling. Tubers which lose turgor during the Summer may just survive but their following years growth will be weakened. The bottom of the pot will probably never quite dry out and light waterings to the top of the pot should suffice.
The dead flower-spike and foliage should be removed when they will lift free without resistance.



Mid-August until September

5. Repotting.

Compost: 5 parts sharp grit
1 part loam
1 part leafmould) food for fungus
1 part fine bark)

Exact proportions vary depending on the quality of the loam. Sharp drainage is essential.

Pots: plastic half-pots with minimum diameter 5". Smaller sizes dry out too quickly to the detriment of the fungal activity. Tubers are cleaned gently of debris. A third of the compost is added to the new compost to ensure an adequate carry-over of fungi. Pots are watered-in thoroughly and stand on slatted staging to prevent water from one pot being absorbed through the drainage holes of another. This could possibly transfer fungi, many of which are not specific, between pots and may not be beneficial. Shading removed in October.

The method of cultivation shown here has evolved at Kew over the last few years and many individuals have contributed to this process by sharing their knowledge and insight. Further accounts are given in the following publications:

Bailes C. et al The Cultivation of European Orchids
The Orchid Review January 1987
Cribb P. and Bailes C. Hardy Orchids. Christopher Helm 1989
Bell S. The Cultivation of Tuberous European Terrestrial Orchids, Alpine Garden Society Bulletin, June 1990

Sandra Bell
Royal Botanic Gardens, Kew
January 1991

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THE MORE YOU THINK YOU KNOW

We seem to say it every year but 1990 was a 'funny season' wasn't it. The Springtime was good with I should think more pleione flowers than I have ever had before and they were so early too. A pan of **P.Brigadoon 'Bellever Tor'** I showed at the Alpine Garden Societies Early Spring Show at Epping flowered three to four weeks later this Spring.

I'm always curious to find improved growing methods and composts for my plants and as a consequence of this tried a couple of different mixes January 1990. They were rather elaborate and included Beech leaves, Bark, Composted bark, Coarse grade Perlite, Sphagnum moss, Cork granules and Peat tailings. Thinking to myself that there was nothing outrageously different to normal I potted the majority of my pseudobulbs in this mixture. The start of the season was fine with good root growth and good foliage. In the Summer even though the weather was very hot with temperatures in the high nineties and on a few occasions just over the hundred °F. in the shade the pleiones seemed to be going along nicely. In normal years water was generally needed a couple of times a week unless there was a lot of rain, and water twice a week last Summer seemed to be all that was required surprisingly. After my plants finish flowering they are transferred to cold frames and stay there up until they are completely dormant. Always worked well before and all seemed alright with masses of good unblemished leaves. One morning when watering I noticed movements among the plants and closer inspection revealed some frogs in among the pots. This was nothing new I had often found them there before but closer inspection of my plants which is not to easy with so many leaves, showed that the frogs had buried themselves in a lot of the pots and all I could see was the ends of their noses poking through the compost. At first I was quite amused by this,

but when I realised how large the frogs were and how many pseudobulbs had had their roots broken off and in a few instances were even pushed out of the pots, something had to be done. My ever supportive wife came to my rescue and between us we removed all the pots from the frames and sealed every possible access the frogs had. It's surprising how large a frog can squeeze itself through so small a gap. After this task was completed the next thing was to move my 'lodgers' from the pots and I found the best way was to water the pots with as cold a can of water as I could find. They didn't always jump out of the pots but it made them wriggle enough for me to see where they were. This job completed, the anti bird nets were put back in place and the pleiones peace was restored. The next job was to line a hole in the ground with polythene sheeting and to fill it with water for the frogs to live in. Well they are nice and didn't mean any harm.

When it was time to clean the bulbs the ravages of Summer became apparent. Some bulbs were fine and had promising flower buds on them but others were small or very small and were obviously not going to flower. My biggest single loss was of a pan of cream **Eiger.** From a single bulb I had built up enough stock to fill a ten inch pan and last Spring the pan was completely covered in flower, many bulbs having two flower stems and with two flowers on each stem. All I have now is a few non flowering bulbs from around the edge of the pan. This pan appeared to have been frogless and the only conclusion I can come to is that in spite of the heat the compost stayed too wet. Cleaning the remainder of my collection showed that none of the pots had a good root system in them in fact a lot of the bulbs could just be picked off of the surface of the compost and had virtualy no roots at all.

Thinking carefully about my compost, I can see no ingredient in it that would have held too much water except possibly the peat tailings. This type of peat

is 'young' and is not so solid as moss peat and because of this is rather fluffy to the touch but I wouldn't have thought that it would have been too absorbent. The other thing to consider is whether the roots which started off growing alright died as a result of lack of water early in the Summer and that new roots or any that were left were damaged by what amounts to overwatering throughout the rest of the season. I know the frogs were responsible for some of the damage but not all of it. This year I shall endevour to keep more air-space between the pots so that it will be easier to see just how well the plants are growing.

My experiences of last year certainly were rather devastating and made me think of the saying 'The more you think you know, the less you find you know'. This Spring I have gone back to an old tried and tested compost of equal parts Coarse grade Perlite, Composted bark and $\frac{1}{2}$" to $\frac{3}{4}$" Bark chips. I shall still use Fisons Hanging Basket Feed for feeding throughout the season as I have found it quite successful over a number of years. I feed every other watering which amounts more or less to feeding once a week. Having made a muck up of my own culture last season reinforces the major point of pleione culture and that is that they can be grown in almost any compost mix but you must be sure to learn how to water it properly.

Lets hope for a more normal 'Funny old season' this year.

P. Bradbury, Blind Lane, BOURNE END, Bucks. SL8 5LA.

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EPIPACTIS PALUSTRIS (L) CRANTZ

THE MARSH HELLEBORINE

Of the five species of **Epipactis** native to the British Isles **E.Palustris** must surely rate as the most attractive. Indeed it is considered by some to be our most beautiful orchid, it is certainly recognisable as an orchid even to the uninitiated whereas many other native species are not.

It is by no means a common plant in Gt. Britain but where it is found it is generally there in abundance. Its stoloniferous mode of growth (like lily of the Valley) ensures that it colonizes large areas, that and its abundant seed production. It is found mainly in calcareous (alkaline) soils but is also found in neutral soils from which alkalinity has, over long periods, leached away. Such a site is the Gower Peninsular where the once limey sand dunes have become neutral. It is also noticeable that it is much shorter in stature when found growing on sand dunes or in old chalk workings in damp hollows. Plants found in damp alkaline meadows are invariably much taller robust plants, presumably benefitting from the abundance of humus available,lacking in sand dunes and chalk workings.

Most books on the subject describe two distinct forms of this plant. The type plant with the outer petals being creamy white with light red veining, inner petals being creamy white stained red at the base and the lip being white with red veining in the throat. The second form, known as var. **ochroleuca**, lacks all red veining, being green tinged yellow in the petals and with a white lip. This form also lacks any red colouring to the ovary and stem, faint traces of which are present in the type plant.

There does appear to be a third form, which for clarity I will call form **rubra.**

Growth commences with the appearance of purple leaves which remain thus coloured until the flower buds form. By this time the flower stem is red, as are the ovaries. The leaves turn from purple to red and slowly turn part green. The plant is approximately half the height of the type plant although the flower size is the same. The flower is predominantly red only the lip being white. There are fewer flowers, ten being the maximum number seen, whereas the type plant can have up to twenty.

Cultivation

Bearing in mind the plant's preference for a neutral to alkaline soil, to exposure to full sun and bearing in mind that it is the **Marsh Helleborine** cultivation presents few problems. I use clay pans but see no reason why plastic cannot be used with equal succes. To neutralise my acid loam I add Dolomite limestone, perhaps sufficient to make the compost slightly alkaline, others have equal success using quarried chalk.

Use wharever is available but **NOT**, repeat **NOT** "Old mortar rubble", old cement can't be of any use at all.

Compost

3 parts sieved loam
1 part well rotted leafmould (oak or beech being preferable) sieved
1 part really sharp sand or flint chippings
1 part Dolomite limestone or chalk (if the loam is very acid - 1½ parts)
Topdress with limestone chippings/leafmould mixture

Potting (October - November)

Epipactis palustris is fairly shallow rooted, just occasionally a root will delve deeper into the compost. Pans not less than four inches deep should be used and, having placed perforated zinc over the drainage hole should be filled to within two inches of the rim. Lightly firm the compost and spread the roots of the orchid over the surface. Continue adding compost, gently firming as you go until the crown of the plant is just below the surface. Tap the pan to settle the compost and topdress with the limestone chippings/leafmould mixture. Thoroughly water the pan and allow to drain. Place on the greenhouse staging where it should remain until the following May/June.

Aftercare

The pan should never be allowed to dry out completely being kept just moist during the Winter months and very moist during the growing and flowering season. The plant, if happy, will multiply and could well fill a nine inch pan in two seasons.

The only feed I give my own plants is an annual top up of leafmould/Dolomite mixture. Repotting should not be necessary for three years.

Availability

In view of the fact that it is extremely amenable to cultivation it is surprising that this lovely orchid is not more widely available commercially. It is occasionally offered by specialist nurseries. Search it out.

Norman Hart, Wokingham.


Epipactis palustris

DAVID'S LITTLE DARLINGS

When I saw my first pleione in flower I assume, like the rest of growers, I caught the bug. What is it that drives people to spend hour upon hour giving the little darlings all that loving care and devotion only to have three to four weeks (if lucky) of the wonderful flowers that we love so much.

This will be my third year of growing. I started off with the beginners collection from a grower up the hill, Ian Butterfield.

Not knowing anything about pleiones, talking to Ian on a question and answer basis, solved my initial queries. He also gave me another name, Peter Bradbury, the producer of "The Pleione Report". I am a lucky boy having not one, but two such well known growers not three miles from my home.

Advice came from both directions and along with avid reading, I soon realised that opinions differ, so it was make your mind up time, for me anyway. All agree on certain points which must be adhered to. Compost must be light, open, free draining and yet stay moist. It must grow cool, have plenty of fresh air and be fed once a week or there abouts and, of course, have lots of love.

In the season 1988-1989, I had no problems with compost as it was supplied with the beginners collection. All pleione bulbs flowered on a shelf erected in the outhouse against a North facing window, not too much light through. I had no greenhouse or coldframe at that time, so as soon as the fear of frost had gone, I put them out in the garden in the shade of the outhouse. I fed them about every ten days with a weak solution of "Baby-Bio". The end product was disappointing, the bulbs were too small to flower although most had two bulbs. Not being put off, I bought more stock to try again, but this time I made my own compost for the 1989-90 season as follows:-

Beech nut husks	3 parts bulk
Bark	3 " "
Beech and Oak leaves	2 " "
Garden moss	1 " "
Sharp sand	1 " "
Pearlite	1 " "
Bracken	1 " "
Horse manure	1 " "
Dusting of bone meal	

I also made an 8' X 4'6" shade house with a tray lined with polythene to hold water. I filled this with sharp sand topped with pea shingle and filled it to the top with water. The pots were stood on the shingle.

Apart from feeding and overhead spraying, no water was added directly to the pots, but the tray was kept full to the brim with water. The result of this was that the roots went for the dampness in the sharp sand, growing extensively through the bottom of the pot. This was great until the pots had to be moved back into the shelter of the cool greenhouse before the early frosts. The roots were damaged of course, but as this was very near the end of the growing season I didn't worry.

Below is a report of Pseudo-bulbs and bulbs produced from each pseudo-bulb planted and grown using the above method. Large, I have graded as being 17mm or above in diameter and I hope all will produce flowers in the Spring of 1991.

NAME	LARGE	SMALL	BULBS
P Alishan	1	1	
P Eiger	1	1	2

cont.

P Jorullo	2	1	3
P Katla	2		3
P Shantung	1		3
P Tolima	2	1	2
P Tongariro	2		3
"	2	1	3
P Versailles	2		

As the 1990 Summer was very hot and dry, red spider was a big problem with most growers, but not with lucky old me. Was it because of the damp air constantly rising from the wet gravel tray that kept them at bay I wonder? My cymbidiums, which were in the same shade house, under the same conditions, were also unaffected. I did however, have problems with another critter that attacked both pleiones and cymbidiums. It was a caterpillar. It was about the size of a leaf miner but green with a brown head and didn't "mine" the leaf as such. Instead, it tied two leaves together with a silk thread and proceeded to eat both top and bottom of the two leaves joined together leaving the veins intact. A lot of damage was done before it was spotted as it chewed away between the leaves unnoticed. Has anyone any idea what this is? I would like to know.

In the season 1990-91, I will be growing as last year except for a change in my compost mix i.e.

Graded pine bark one eigth to three eigths inch 3 parts by bulk

cont.

Beech nut husks broken into quarters	3	parts	by bulk
Beech and oak leaves cut into quarter inch strips	2	"	"
Sphagnum moss peat	1	"	"
Garden moss cut into half inch lengths	1	"	"
Sharp sand put through flower sieve	1	"	"
The course grit only was used			
Course Perlite	1	"	"
Bracken cut into half inch lengths	1	"	"
Dried horse manure rubbed through one eigth sieve	1	"	"
A dusting of bone meal			

I am also going to try feeding with cow pat tea on some of my stock, much watered down though so as not to burn the roots.

With the exception of the Perlite, all is free gathered from the countryside, "hand picked" as you might say. In my vehicle, I always carry an axe, secateurs and some sacks, being ever ready to take advantage of a pine tree cut or blown down, gathering bracken or leaves and getting the gravel from a river bed and so on. It's all a labour of love, nothing being too much effort for my little angels. Good growing to all this season.

DAVID SHARP, 11 Branch Road, Loudwater, High Wycombe, Bucks. HP10 9UY

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GROWING TUBEROUS EUROPEAN ORCHIDS

This group of plants has an unjustifiable reputation for being difficult to grow, probably based on earlier attemps to grow them outside where they are subjected to the vagaries of the British Winter. It is important to realise that they are mostly plants for greenhouse cultivation and, once this has been taken on board, there is a substantial reduction in attendant problems. For example, as an alpine gardener, I find the genes of **Androsace** difficult to grow for any length of time but have had reasonable succes as a beginner with tuberous orchids. The purpose of this article is to describe the straightforward procedures involved in the hope of encouraging others to make a start with these beautiful and satisfying plants.

There are, of course, many European orchids with a rhizomatous life style - such as **Cypripedium** and **Epipactis** - which require rather different cultural techniques and are outside the scope of this account (see, for example, the account by N.Hart, 1990. Cypripediums in pans. National Pleione Report, 11-24). The genus **Dactylorhiza** possesses palmately-lobed tubers and for simplicity of cultivation is perhaps a good place to start. Many species can be grown in a range of composts but, in my experience and that of others, they often do better under garden conditions. The majority are perfectly hardy and cope well with Winter wet which is hardly surprising as most occupy damp habitats in the wild - often being referred to as "Marsh Orchids". These do well under standard peat garden conditions - I do have DD. **elata, fuchsii, maculata** and **majalis** thriving in raised peat beds and producing self-sown seedlings. They need no special attention other than occasionally dividing those which clump up rapidly.

There are however, exeptions. I have successfully grown **Dactylorhiza romana**

using the conditions described below and there is also **D. sambucina** which I have not grown but is known to be difficult in cultivation. We now come to the rest of the European tuberous orchids. The following have been grown under glass using a standard technique : **Aceras anthropophorum, Anacamptis pyramidalis, Gymnadenia conopsea, Orchis spp., Ophrys spp.,** and **Serapias spp.** We are, however, immediately faced with a dilemma in deciding how to grow these plants. The Sainsbury Orchid Conservation Project at Kew over recent years has pioneered work in both orchid seed and germination and culture of the adult plants. Briefly, successful seed germination and subsequent seedling growth has been achieved by sowing sterilised seed onto an agar plate which has been previously inoculated with the symbiotic fungus. Fungal isolates are derived from the living collection and it, therefore, follows that growing conditions must be consistent with maintaining the symbiotic association between the adult orchid plant and the fungus. Potentially, at least, this is not straightforward as these orchids in cultivation are susceptible to fungal infections and the necessity of maintaining the fungal symbiont precludes the use of fungicides. Kew contend that maintenance of this symbiotic relationship in cultivation is beneficial to the orchid. By contrast, Dr. Tom Norman who has popularised the cultivation of these orchids for many years suggests that the fungal relationship can be essentially ignored by the amateur grower. Whatever the truth of this situation, which incidentally has not been rigorously tested, an important point for the amateur is that the orchid species are in exceedingly short supply - most being unavailable commercially.

More than anything, it was the latter point which caused me to come up with a cultivation procedure which draws on both the above approaches. These European tuberous orchids, many of which are adapted to a Mediterranean climate, have a different seasonality of growth to the genus **Pleione**. Growth of the

dormant tuber is triggered by the rains of Autumn and continues throughout the Winter and Spring, followed by a period of Summer dormancy. Plants are generally obtained as dormant tubers around August or September and this provides a convenient starting point for the annual cycle. Plants are grown in free-standing, plastic half-pots following the Kew recommendation. The notion here is that a more stable moisture content can be maintained than with clay pots and that the half-pot enhances the air content of the compost. The pots are provided with basal drainage in the form of coares grit and the compost used is very free-draining. I have used varying amounts of the following components but have currently settled for equal quantities of : fine pine bark as used for epiphytic orchids (obtainable from Burnham Nurseries Ltd., Forches Cross, Newton Abbot, Devon. TQ12 6PZ) coarse grit; John Innes No.3; and oak leaf mold.

When potting up the above compost is used loosely, with only light firming applied, so that the air spaces are maintained. Old compost from the previous pot is not used to avoid possible carryover of fungal disease to the next growing season. As a further precaution, some grit laced with Captan is applied around each tuber before filling the pot. When planting the tubers, it should be remembered that their growth form is very different to that of bulbs. Both shoot and root initials are formed at the top of the tuber which should be covered with compost to a depth of at least 2.5cm. The pots are finished off with grit to provide a relatively dry surface as the rosette leaves often come into direct contact with the substrate in the pot.

The pots are maintained in a greenhouse devoted to a mixed collection of bulbs and alpines. An electric fan heater controlled with a thermostat is used to prevent freezing and the vents are opened as much as possible when external conditions allow. Further air movement is provided by an extractor fan which switches on when the greenhouse temperature rises above 5°C. The greatest pos-

sible care is taken with watering of the pots. The aim is to keep a reasonably constant moisture level, but to avoid prolonged contact with the shoot as this can encourage fungal disease. Water is applied carefully around the edge of each pot and, as far as possible, watering is only carried out on warm days. Occasional waterings of Benlate are carried out during the growing season as a further prophylactic measure. The greenhouse glass is shaded in March at the time when many of the orchids are in flower or spike. Watering is reduced as the shoot commences to die after flowering and the pots finally moved to beneath the bench for their Summer dormancy. During this time, it appears that excessive drought may be damaging and the pots are gently watered every 3-4 weeks prior to annual repotting in August or September.

As noted earlier, one of the main problems is the relative scarcity of these orchids in cultivation. A small number, such as the genus **Serapias**, will often form more than one replacement tuber but many species are not so obliging. Sowing of seed is unreliable unless the relatively sophisticated techniques used by Kew can be reproduced. However all is not lost as it is possible to carry out vegetative propagation in order to gain a modest increase in the number of tubers. The new replacement tuber found at the time of flowering is fully mature and, if removed at this stage, will flower the following season. Removal results in the production of at least one additional tuber from the underground part of the orchid stem. In practice, Dr. Tom Norman has found that the best time to do this varies with the genus. For **Ophrys**, when one or two flowers have opened, but later for **Orchis** which should be propagated when the flower spike is mature or starting to fade, and even a little later still for **Dactylorhiza.** In all cases, the plant is tipped out of the pot and the new tuber cut off and repotted for the normal Summer dormancy. The remainder of the plant is re-planted in a separate pot and its growing season extended for

as long as possible. Under my conditions, the plant is placed under the bench where there is glass-to-ground and watered fairly generously. At least one new replacement tuber will be found when repotting is carried out, but it will normally not be large enough to flower in the next growing season. I have found this so called "Spring" method easy to carry out and highly reliable. I have though, no experience of the "Winter" technique which involves manipulation of the plant at around Christmas time.

What of the future? Thanks to the work of a few dedicated individuals (see references below), cultivation of these orchids is now relatively trouble free at least when compared to the past. The major problem now is availability of plants for the would-be enthusiast. Micro-propagation has been successfully applied in some cases and there are nurseries getting interested in the possibilities of production from seed. Hopefully, in years to come, this situation will be remedied but it may well depend on creating the demand to justify large scale commercial production.

Useful References

Cribb, P. and Bailes, C. 1989. Hardy Orchids. Christopher Helm, London

Bell, S. Cultivation of tuberous European terrestrial orchids at Kew. Quarterly Bulletin of the Alpine Garden Society, 58, 96-100

Norman, T. 1989. The cultivation of European tuberous orchids. Quarterly Bulletin of the Alpine Garden Society, 57, 154-171

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SOMERSET REPORT

The 1990 season was almost a copy of 1989 with similar results - smaller pseudobulbs but flowers produced on smaller bulbs. Among my own collection **Tolima, Eiger, Limprichtii, Fuego** and **Rakata** flowered prolifically. White varieties **Clare, Avalanche** and **Alba** failed to produce any flowers. **Cairngorm** was the only white to flower with me. There was no obvious difference between those that spent the Summer out of doors and those kept in the greenhouse.

Being unable to obtain supplies of sphagnum moss I used local coarse mosses in my compost with no apparent deleterious effect. **Rakata** flowers were outstandingly large and handsome this year as also were **Shantung.** I grew **El Pico pheasant** for the first time and was delighted with it's overall shining deep red colour.It caused quite a stir among our Orchid Club members.

Rockwool again proved a very suitable medium. I use the water repellant type with Bob Dadd's special liquid feed. As this medium is inert a higher proportion of nitrogen is required compared to bark mediums. After initial potting the rockwool needs a wetting agent to assist water penetration. I find that 3 or 4 drops of Fairy Liquid to a pint of water does the trick. Rockwool needs more frequent attention during long dry periods and also in long periods of persistant rain. In the latter case I find it necessary to provide cover to prevent over saturated compost. When potting up with rockwool it is advisable not to make the compost too firm - just sufficient to hold the bulbs comfortably in place.

What has happened to that little gem **Maculata**?. No one seems to have it these days. I have lost quite a few over the years which all points to its cultural difficulties. Some say it needs higher temperatures, others say it should be repotted immediately after flowering. Are there any successful growers of this

little beauty who can give us some cultural tips?.
Apologies for the shortness of my article. (No apology needed Ivor. Thankyou very much for sharing your experiences with us). PB.

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THOUGHTS TOWARDS A GARDNERS CLASSIFICATION OF PLEIONES

The final word on the naming and the classifying of plants is of course the prerogative of the botanist. That is right and proper and gardners have to accept the specialists rulings even though decisions sometimes seem to be bizarre. However taxanomic botanists are really interested solely in wild plants. Cultivated plants come into a grey area - and botanists are frequently only too ready to disclaim any responsibility for the identification of garden plants.

Most wild plants are species; with hybrids between species being much less common. By contrast, in gardens most of the plants are hybrid in origin. First generation hybrids - that is hybrids in which the two parents are different species - are frequently recognisable as intrmediate and botanists have rules for their nomenclature. But second generation hybrids, in which one (or both) of the parents is itself a hybrid are notoriously difficult to recognise. Indeed different sister seedlings from the same cross frequently have no obvious family resemblance. Under these circumstances it is not surprising that the botanist washes his hands.

These introductory comments apply equally well whether the 'garden plants' that we are thinking of are roses, daffodils..... or orchids. However in the orchids we have a well established, but quite exceptional, system for registering the names of hybrids. I can well understand the commercial importance of this system but I am far from convinced that it serves any other useful purpose. Who among us could predict what **PLEIONE NINJA TURTLE** looks like even though we know its parents are **BLIND DATE** and **HONOLULU**?. Among my progenies of **Soufriere** for instance I have individual clones that cover almost the full range of Pleione shapes and colours. Several of these have sufficient promise for me to be bulking them up as possible worthwhile cultivars. My point is that if they make the grade they will do so not because they are **Soufriere** but because of their own personal merits. In my trials they are competing not so much against **Soufriere** as against other grexes, one for instance against named clones of **Versailles,** and another against specified clones of **Shepherd's Warning.** A few way out individuals that don't look like the rest of the family (indeed one only has my word for it that they are Soufriere) are setting their own standards.

Finding myself dissatisfied with the orchid system of hybrid nomenclature I naturally turned to wondering how do breeders cope in other plants. The answer is that registration is of clones, not of hybrids. Quite regardless of its parentage (and this is convenient if the parentage isn't known!) any meritorious seedling can be named. Typically it also has to be classified to a gardeners classification which gives it a more or less accurate impression of what it looks like.

We can illustrate this by looking at daffodils. I see that there is a new daffodil introduced this year under the name Jambo. It is classified as a 2Y-R. If you are interested in daffodils this tells you instantly that Jambo is a

narcissus with a trumpet not as long as a full trumpet daffodil, nor a little short cup, but a sort of half length trumpet. Further more the petals are yellow and the trumpet is red. In other words if you know your daffodils it is something like the well known and very beautiful Torridon and a good many other daffodils that are also 2Y-R. To the ordinary daffodil grower the parentage of Jambo is of little interest, but it is easy to find out that it is Shining Light X Torridon, both of which are also 2Y-R.

In my opinion there are real advantages in working towards a system of this kind in Pleione. Much of the structure is already in place. Thus the full name of one fine Pleione clone is Pleione **Vesuvius Leopard A.M.** The vesuvius part is registered (telling us that the parents are **bulbocodioides** and **confusa**) but **Leopard** is not - nor do we have a registration system for that epithet. My stand is that the important part of the name is **Leopard** not **Vesuvius.** If you buy a Leopard you know exactly what you are getting. It so happens that **Vesuvius** is a good grex with few duds so that if you buy a **Vesuvius** you are likely to get a reasonable plant, but this is certainly not so for every grex. In fact even with **Vesuvius** there is a problem. The **bulbocodioides** parent of leopard is the hexaploid **Yunnan.** Progenies of **Vesuvius** have been raised many times, always to the best of my knowledge with a hexaploid **bulbocodioides** as the one parent. It would be possible to raise **Vesuvius** using the diploid form of **bulbocodioides** - I am unaware if this has yet been done, but I do know that the progeny would be very different from **Vesuvius** as we already know it. My guess is that it would resemble **Shantung** rather than **Vesuvius.**

I am pleased to see that what I am suggesting re **Leopard/Vesuvius** is already practiced by the Alpine Garden Society. In their notice of the award of A.M. to **Leopard** they left out the **Vesuvius** part of the name.

This leaves us with one important step - that is to agree a gardeners class-

ification of Pleione. I have worked with my own version of one for years but I am not quite satisfied with it so this is really a discussion paper.

There are lots of different shapes in Pleiones, but in contrast to daffodils I think colours should take precedence over shapes when we come to classification. Even so no clone is worth recognising if it doesn't have a good shape. I recognise lots of shape faults, notably narrow petals, twisted petals, curled petals and 'droop'. Among shapes I recognise a standard pattern, and also **'Pogonioides'**, 'terrestrial' (with flower facing up) and **aurita.**

In my system of colour classification the plant is viewed just below eye level. There are then three main colour areas. They are:

1. the tepals, especially the lateral petals which should be broad, flat and forward facing. Ideally in the standard shape the dorsal is end on in this view so not very prominent, and the lateral sepals are largely obscured by the lip. Even so faults in either of them can upset the balance.

2. the trumpet, i.e. the outer surface of the lip where it is folded over the column.

3. the exposed forward part of the lip mouth (i.e. not deep in the throat). In the terrestrial shape one sees further into the throat and at the same time the outer surface of the trumpet is less prominent.

The tepal colours I try to distinguish are purple, pink, white, yellow, peach, apricot and polychrome, though these grade into each other so much that it is far from easy. In those flowers that I call selfs the trumpet colour is the same as the tepal colour; in bicolors there is a marked contrast between tepal

and trumpet. Bicolors are generally white trumpets with purple or pink tepals, or yellow trumpets with peach, apricot or polychrome. Until last year I thought all yellows were selfs, but now I have several yellow tepals with white trumpets. A further variation on trumpets is flushed when there is a slight suffusion of the tepal colour on the trumpet so that there is in fact a complete range from self to bicolor and arbitrary decisions have to be taken.

The lip mouth colouring is of course the most impossible part to characterise with such a variety of shades, intensities, markings, etc. so I try to give a general impression (e.g. grey, ginger,amethyst) as well as a more detailed description of just what there is to see. In fact this third category is so difficult that I tend to rely initially on the first two tiers only.

As an illustration, one of my classes is Purple self. This includes the following:

pogonioides shape: **speciosa 'Blakeway Phillips'**

aurita shape: **aurita**

terrestrial shape: **bulbocodioides 6X 'Yunnan'**
" " **bulbocodioides 6X 205**
" " several clones of **Stromboli**

standard shape: **Tongariro**, several clones
" " **Erh Hai**, several clones
" " **Etna 'Bullfinch'**

Common **limprichtii** comes in here - it has an odd shape

several clones of **Brigadoon**, semi-pog shape, frequently pronounced droop.

There is such variety here that I would hesitate to choose the best. I have 12 clones of flowering size in the standard shape group - all very fine with small differences between them. None is quite perfect. They are good parents and more progenies will flower soon. One day I will see one of this group of perfect shape, rich intense colour, no fading, lip nicely flared at the mouth with ample deep red blotches and brilliant yellow crests coming well forward. Then the grex will be of no significance; that plant will be a king among clones and it will have a suitably befitting epithet.

D.J. HARBERD.

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PLEIONES IN CHINA

Almost immediately after the end of Chelsea Flower Show my wife Iris and I found ourselves on a Cathay Pacific 747 bound for Hong Kong, and then on to Chengdu in the province of Sichuan in China. We arrived in Chengdu late in the evening and on the following day travelled in an eighteen seater bus along unmade roads with many potholes to our first Guest House in Wolong. I don't think our bus had any springs or shock absorbers as we had to catch our cases as they bounced about on the rear seat. Our driver just did not slow down whatever the road conditions. There were lots of interesting plants along the road but we had a long way to go and did not have time to stop and look at everything.

Before we reached the Guest House, in a steep sided valley we found our first pleiones. Unfortunately not in flower and not very large but pleiones all the same. These were growing at about 7,000ft. on almost vertical wet rocks in a moss and debris layer about half an inch thick. There were sedges and ferns with them in the deep shade. These were almost certainly **P. bulbocodioides.** A little farther along the road we found a colony of **Primula tenuiloba,** with tiny pale pink flowers. We found other colonies of pleiones in the Wolong area over the next few days always growing in deep shade on steep wet rocks.

From Wolong we drove to Emei town and spent four days exploring Mt. Omei - the fabled mountain that has more species of plants growing on it than we have growing in England. Although we found a number of interesting plants we were disappointed as the mountain did not live up to our expectations. There were so many steps that you could climb for hours - up several hundred feet and still not find anything very different. You then had to walk all the way back down again.

P. speciosa does grow on this mountain but we did not find it. Quite simply we could not get to the place where it grew in the time we had available.

We left Emei town at midnight on June 10th. to start our one night by train - and two day by bus - journey to Lijiang in the province of Yunnan where we arrived in late afternoon.

The next day we drove out of Lijiang towards a small gap in the hills which we could just see in the distance. The fields on each side of the tarmac road were cultivated, mostly with corn. As we drove along this road, climbing steadily all the time the land became much poorer and the fields of corn ceased with the land just being used for grazing. After driving for about an hour almost in a straight line - the road was unmade now - we began to see wild flowers. The red of **Incarvillea mairiei** stretched away into the distance and a

little farther along the road the dwarf white **Anemone rupicola** did the same. As we entered the hills the ground under the pine trees was covered with mauve **Roscoea tibetana.**

We eventually reached a bridge across a small river in a well forested valley. This was our destination - Bai Shui - meaning White Water. We leave the bus and start walking along the river passing a small clump of cerise **Primula poisonii** almost growing in the water. A little farther along the bank we find yellow flowered daphnes hanging over the water.

Not far from the bridge we found pleione leaves on the bank at the side of the river and also on a large rock almost in the river. They were mostly in the shade but some were growing in the full sun. These had smaller leaves than the others and were quite dry when we found them having only about $\frac{1}{4}$" of debris and moss to grow in. The bulbs on the rock in the shade had a little more depth of compost.

Farther up the valley, at about 10,000ft. we had to clamber along the steep slope in the virgin forest, holding on to the trees to prevent ourselves from slipping into the river twenty feet below. We rounded a corner and there in front of us was a bank covered in **P. bulbocodioides** in bloom. There were so many variations in colour and spotting on the lips that I did not know which to photograph first. It was a sight I shall never forget as I had not expected to see so many flowers this late in the year - June 12th. All these were growing on a very steep bank in a deep humus made up of leaves and pine needles. Within fifty yards of this bank of pleiones we found **Cypripediums flavum, tibeticum, margaritaceum** and **plectrochilum** all growing in the same conditions as the pleiones.

June 16th. found us leaving Lijiang for the last time on our way to Dali. Phillip Cribb, leader of our group, showed us where he had found **P. bulbocod-**

ioides on an earlier trip along this road. They were growing at the top of a pass in a thick layer of moss and humus. The bulbs were near the surface and shaded by the leaves of **Rhododendron yunnanense** and **Lyonia ovalifolia.** The soil underneath the humus was the usual crumbly red clay. All these pleiones were growing vigourously.

The next day found us on the road again from Xiaguan, where we had stayed overnight, towards Kunming. Phillip had seen **P. yunnanensis** in full bloom just off this road three years earlier. I cannot imagine how he remembered the spot but 147Kms. from Xiaguan he told our driver to stop and then took us to a site just off the road and there under the shade of dwarf rhododendrons and **Lyonia ovalifolia** were dozens of **P. yunnanensis.** They were growing on a steep slope of crumbly red clay with lots of humus on the surface. Some bulbs were growing in full sun and these had smaller leaves. The altitude here was 7,000 - 8,000ft.

As we had a long journey that day we only had a very short stop and not enough time to explore properly but I would guess that there were many more **P. yunnanensis** than we actually found.

That night we stayed in Kunming, spending the following day around the town and Botanical Gardens before flying back to Hong Kong and then home.

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PLEIONES DOWN UNDER

Pleiones are gaining international popularity and Tasmania, where I live, is no exception.

It was suggested to me last Summer that a letter-cum-article on our growing conditions and cultural methods would be of interest to U.K. pleione enthusiasts and altho' I'm guilty of dragging my feet, I happily agreed to write one.

Tasmania, a little island about 400 miles South of the Southern tip of Australia is the place from which the Antarctic explorations start (the port of Hobart) and located in the "Roaring Forties". The climate is mild when compared to the U.K. generally, buthas been likened to Cornwall in the West Country (goodness knows why "the West Country" when it's the most Southern county) where the influence of the Gulf Stream sweeping down the coast softens the rigors of Winter.

Our sunlight hours are probably greater with mid Summer (December) sunrise at about 5.30am and sunset at 9.30pm, and Autumn (March) 6.00am sunrise and 6.00pm sunset with the sun usually visible. However it does not get oppressively hot like the 1989 Summer I experienced in the U.K. whiched nearly wiped me out.

In my location we get maybe 5 to 10 frosty nights each Winter, rarely snow, with Summer average max/min temperatures of 52-72°F and Winter 40-52°F and an annual rainfall of about 50 inches.

I had always been led to believe that pleiones were shallow rooted being both epiphytic (growing on trees) and terrestrial with only a couple of inches of orchid medium on top of coarse pine cobbles being required.

However my experience indicates that a good four inches of free draining medium is fully penetrated by the root system with bigger plants resulting. No additional drainage is provided other than punching additional holes in the bottom of the plastic pots (note: squat pots not deep ones) and these pots sit on open mesh to keep them off the ground. When growing them enmasse plastic pots are replaced by the white polystyrene grape boxes collected from the

the local fruit merchants. These containers which are probably also used extensively in the U.K., altho' not aesthetically pleasing appeal because they are free and functional!

All plants are treated the same way which will horrify the purists, but there are only so many hours in a day and apart from **P. hookeriana** all do well and I have no cause to treat them differently.

They are sat on top of 3"-4" of medium after having trimmed the roots to about 1"-1½" and then half buried by adding additional mix. The bulbils are then thinly scattered over the top before watering. Then a little medium is scattered over the top of the bulbils more to bed them in than cover them.

Blackbirds, a scourge which the early settlers introduced into the country can play havoc scattering the newly planted bulbs and I therefore throw a net of mono filament anti bird mesh over all pots and boxes until they are established.

Having burnt the roots of all pseudobulbs one year I now never use charcoal, as I consider this to be the culprit. I used 30% of reclaimed Cattleya mix which was preponderately charcoal and I think that the charcoal had stored up the salts of spent fertilizer and then released them when heavy watering commenced. In fact like many orchid growers over here I have given up the use of charcoal altogether in all orchid mixes without any adverse effects. A most over-rated and unstable product in my opinion.

Another product I keep out of my mix is sphagnum moss which breaks down into a slimey mass and sours if nitrogenous fertilisers are used, thus damaging the roots. A wonderful product for promoting root growth in it's live and pure form, but not with nitrogenous fertiliser.

The various mixes and conditions under which Pleiones are grown indicate their wonderful tolerance, they are even grown with reasonable success in some

gardens when planted directly into the soil but this method is not recommended. They are primarily grown outside (i.e. not in greenhouses except when in flower and even then only to protect the flowers from the wet weather) in partial shade - ideally under shade cloth in an area sheltered from the wind.

The mix I have found that they snatch at as I go past is:

For 10 gallons.

1 part pine bark $\frac{1}{2}$-$\frac{1}{8}$

$1\frac{1}{2}$ " leaf mould (oak or myrtle)

1 " coarse sharp sand

1 " peat

1 " natural woodland sandy loam

1 " Poly beans (as in a bean-bag but preferably "minced" waste polystyrene $\frac{1}{4}$-$\frac{1}{8}$)

3 handsful of blood and bone

Each week they are watered with rainwater collected from the greenhouse roofs plus half strength fertiliser,rotating such trade names as Aquasols, Nitrasol, Phostrogen, and liquid cow poo on the "scatter gun" principle that they are more likely over a period of time to get a better balance of trace elements.

Also, during the week I water with pure rain water as required i.e. every two days in dry weather. They are watered more than any other orchid species I own and about 50% more than Cymbidiums.

Most people here lift the bulbs and store in a dry place during the dormant period, but last year, because I was in the U.K. during our Winter I left them outside still potted and altho' it was an unusually frosty and wet Winter they suffered no ill effects apart from overcrowding when they came up the following Spring. They are much more robust and hardy than most people think.

At this stage I have not tried the latest craze of growing them in rock wool (2 parts water absorbant and 1 part water repellent), but after having tried Cattleyas and Oncidiums in this medium for one growing season only the Oncidiums have shown marginally increased growth when compared to those grown in straight pine bark, so I don't expect any dramatic break through when I experiment next year.

If my methods are not already standard practice over there, then you may try them with a few pots - I think you will be pleased with the results.

I am always looking for yellow varieties or species, but of the forty odd I already own only the **Shantung** grex (Dr D Harberd) are yellow with **Shantung "Ducat"** being on it's own. If any one else has other pure yellows they are prepared to release I would be delighted to buy from them.

Happy Growing to every one.

Neville Harrop, 17 Auvergne Avenue, Newtown, (Nr Hobart) Tasmania, Australia 7008

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13th World Orchid Conference, Auckland New Zealand, September 1990.

Since the First World Orchid Conference was held at St Louis, Missouri in

October, 1954, the event has taken place every three years, usually on a different continent. Although the emphasis tends to be on tropical orchids, countries which have a largely temperate climate invariably produce enthusiasts and growers of local terrestrial species, and other plants such as pleiones, which may be hardy under the prevailing conditions. Japan is such a place, and the 12th W.O.C., held in Tokyo in 1987 was notable for its displays of native Calanthe species and hybrids, as well as a good number of other terrestrials and pleiones, including **P.forrestii**, which was openly displayed and sold.

The Conference Show in Auckland was divided between three connected halls, and the layout was such that easy movement around the stands was possible for all visitors. With so many displays, both from nurseries and orchid societies, it took several days to explore them all. The range of design was impressive, and considering that many societies had long distances to travel with their plants, overall standards were high, with many examples of superb culture on show. Most amateur stands had pleiones somewhere on them, either as prominent features, or more commonly, as convenient, small colourful gap-fillers. Overall, naming seemed accurate, although many plants labelled **P.pricei** had flowers which were too pale to be more than simple **P.formosana**, and some **P.limprichtii** was almost certainly **P.Versailles.**

From the far South of the country, around a thousand miles from Auckland, the Orchid Society of Southland made good use of beautifully grown pans of **P.limprichtii**, various cultivars of **P.formosana**, and the lovely **P.Shantung 'Miki'.** The Marlborough Orchid Society, located in the North East of the South Island, devoted a corner of their display to a range of **P.formosana** forms. Several societies are active in the South of the Noth Island, around the capital city of Wellington, and both the Wellington Orchid Society and the Hutt Valley Orchid Circle used various clones of **P.formosana.** North of Wellington, based around

the city of Palmerston North, the Manawatu Orchid Society featured very well grown pans of several **P.formosana** cultivars. From the small number of hybrid pleiones on show, there would seem to be plenty of scope for future expansion, especially as there are obviously some very successful growers. The widest range came from Wanganui, in the fascinating display mounted by Kevin Luff, a young enthusiast who had many examples of **P.formosana, P.speciosa, P.yunnan-ensis** and hybrids **Stromboli** and **Soufriere,** as well as fine plants of the Australian genus **Diuris.** The Wanganui Orchid Club seemed particularly trusting in placing pans of **P.Shantung** cultivars **'Miki'** and **'Muriel Harberd'** within easy reach of the thousands of visitors who thronged the show. From opposite sides of North Island, the Taranaki Orchid Society in the West and the Tauranga Orchid Society in the East both made good use of local selected **P.formosana** clones. Tauranga in particular, had a large island stand with, as a stunning centre piece, a two foot square container of **P.formosana** which appeared as a solid mass of flowers. Even the largest display, by the combined Auckland Orchid Societies, which featured so many brilliantly arranged orchids of all kinds, had pans of **P.formosana** at strategic points. We can only look forward with eager anticipation to the 14th W.O.C., to be held in Glasgow in April, 1993.

David Menzies, Glasgow Botanic Gardens.

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Grateful thanks to all contributors without whose generosity the N.P.R. could not exist. Please keep contributions coming.

Peter Bradbury.