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EDITORIAL

By the time this is printed most Society secretaries will have received a letter from the Orchid Council in respect of written contributions to the magazine. To date response from some quarters has been good but articles are becoming sparse. In fact, we now have more overseas contributors than local.

This is your magazine and its success is dependent on your contributions. The majority of articles have been written by the same few people but we need to hear from more of you, this will lead to a greater variety of opinion and knowledge through our pages.

Some articles have been criticised orally; this is good, but it is better that constructive criticisms be in written form as their publication could lead to interesting discussions in the journal. Some readers may consider that they are not expert enough to write on the subject of orchids. Remember, however, that the word "expert" does not mean one who knows all, but rather one who is skilled through practice or learning. Perhaps this may encourage some of you to write. After all, even if you do not exhibit at the local show but can grow and flower orchids at home, surely an article on your methods is not too much to expect.

The reason Associated Editors were appointed was to encourage written contributions from their particular area, not neces-

sarily to do all the writing themselves. Some of the Editors are doing an excellent job, others are not—for the latter I would suggest if you find that you are unable to fulfil this duty, please endeavour to appoint someone who can.

The quality of the magazine depends on the quality of articles submitted, and so far, our journal is maintaining a reasonable standard. Without a stock of articles to choose from, the variety and quality cannot be maintained.



Militonia hybrid

COVER PHOTO: Odontioda White Heron has as its parents Odontioda Aloette and Odontoglossum crispum. The Oda. Aloette parent in particular was a fine form, a cut spike winning first prize in its section when sent from New Zealand to Sydney to be exhibited at the Sixth World Orchid Conference in 1969.

The cross was made in May 1965 and the seed was sown in April 1966. Several hundred seedlings were planted out from flasks but only about 30 survived to flower. The survivors are all strong growers and several clones with superior flowers have emerged, many with a distinctive pink border inherited from the Oda Aloette parent.

Oda. White Heron "Dainty" received an Award of Merit from the N.Z. Orchid Society when exhibited at the Waikato Society 1975 Spring show where it also won the Martin Clark Cup for the best orchid in the show.

The name White Heron was accepted by the International Registration Authority in April 1975. This is the first registration of an odontoglossum hybrid from New Zealand and is believed to be the first both hybridised and raised in this country. Photo and summary by courtesy of Mr. I. D. James, Hamilton. This fine Odontioda is in the private collection of Mr. James.

READERS' ENQUIRIES

It is envisaged that this section will prove very popular and to enable as many enquiries as possible to be published, please keep your letters as brief as you can. All letters must contain the writer's name and address (nom de plume if desired) and forwarded to the Editor. No private correspondence will be entered into.

QUESTION: When repotting, should the ball of strong roots resulting from potbound plants be severed and shortened before potting on into fresh mixture? These brown coloured roots seem to have small growing white fibres set around the brown roots.—Mitch

Answer: All Orchids hate root disturbance. Unless division is necessary, it is better to leave the root ball alone and pot on into a larger size pot. Remove old crocks if you can do so without breaking the growing tips, leave them otherwise. Select a pot that will allow room for two further growths, put fresh crocks in bottom, position plant and add new mix round the side shaking occasionally to work the mix down. Should division be necessary, use a sharp, clean knife and cut through the plant and root ball. The lower two or three inches can at this time also be cut back. Dust with sulphur or dip in captan solution as a prevention against disease. Although a number of roots will be severed, less over all damage is done and cut roots will in time grow side roots.

QUESTION: Having grown Cymbidiums successfully for many years I have recently acquired some Cattleya hybrids. With the summer growth a few of them have developed purple colouration on the underside and towards the base of the leaves. I am hoping that this is not a disease, could you please identify for me?—P. Tom.

Answer: This condition is a natural colouration inherited from some Cattleya and allied species. Don't burn your plants.

LETTER TO EDITOR

Dear Sir,

In my article, "An Australian Trip", I notice an error, printers or mine is of little consequence, but I think a correction is needed for the benefit of our newer growers who could well run into trouble in attempting to grow in the stated compost of red gum sawdust and old fowl manure at the rate of two to one. At that rate the compost would be too rich and close resulting in the burning off or rotting of plant roots if allowed to become too wet.

I think Valley Orchids preparation is as follows. Coarse Red gum sawdust and several years old deep litter fowl manure are mixed in large quantities; low heaps to avoid overheating. It is turned frequently for three weeks by which time it has been converted to humus and is ready for use.

We have been asked if we use this compost and the answer is no. Not because I don't think it is good, but because we use more readily available materials in native sawdust and pumice and also because our plants are largely exposed to the weather and our rainfall is 40 inches a year more than Adelaide.

Yours faithfully,

Fred Burke

Pleased to have this point clarified—Ed.

ORCHIDS IN NEW ZEALAND

For many readers subscription time will expire with the next issues Vol. 1 No. 6.

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JOTTINGS ABOUT ORCHIDS

By Oncidium

A sideline of growers that is becoming quite popular is the collecting of postage stamps that feature orchids. In the philatelic world this type of collecting is known as thematic, in other words the collection of a theme. This takes many forms, and birds, butterflies, boats, animals, cats, spacecrafts, fish, statesmen etc. are just some of the popular groups collected by philatelists.



amongst others, however Hawkes "Ency. of Cultivated Orchids" proved that indeed *D. nobile* has a larger range than just the Himalayas as I thought. The Colombian and Australian stamps in the photo are two examples from this group.

The second section consists of those countries that issue stamps primarily for sale to collectors and the more attractive the subject the better. They often overlook their own species to show more "popular" genera. The Cuban stamp showing *Paph. glaucophyllum* is a typical example.

The third section deals with personalities, the Papua and New Guinea stamp illustrated showing Schlecter proves that indeed some countries do honour the early pioneers in the orchid field.

Another page is used for the commercial value of orchids, not many here, mainly the Dominica issues of 1951 and 1954 showing the drying of *Vanilla* beans.

This will give a brief insight perhaps into the several hundred different issues that have so far been printed. In most cases they are miniature masterpieces, in some the artists work would appear to leave a little to be desired, but they are all worth having.

Further Reading—The Orchid Review, September, 1975, P302

The common characteristic of orchids is a flower consisting of three sepals (small outside petals) and three petals, one of which is modified to form a lip. The stamen (pollen-bearing or male organ) and pistil (seed-bearing or female organ) are found in one column. All orchids have a single stamen, except four genera which have two.

PRODUCTION OF NEW FLOWERS

by A. H. Blackmore

34 Evelyn Place, Northcote, Auckland.

know the chemical content of the cell, but it is important to understand how it works. Within the nucleus of the cell are chromosomes and within them are molecules called genes, which decide heredity. All cells are continuations of other cells. Cells do not grow, they divide and their divisions constitute the growth of the plant or animal. The cell doubles all its components exactly.

Because of this exact duplication, we as gardeners, can propagate their exact kind by cuttings, grafts, back bulbs, meristems etc. Since the cells which divide to grow roots, stems, leaves or flowers are but extensions of the back bulb etc. the resulting plant is identical with the plant from which the part has been removed.

Each of the gene molecules strung together in the chromosomes can duplicate itself by what is believed to be a template process, each acting as a mould to form a new partner. Each gene makes an exact duplicate of itself which it deposits alongside and in this way another duplicate chromosome is produced, identical gene for gene with the original.

During the process of division, each chromosome splits apart like the two parts of a zipper to form the duplicate sister chromosome, each of which moves to opposite areas within the cell. The cell then divides between these two areas producing two cells.

Every cell in the body carries the full complement of chromosomes with the exception of the sex cells. These only carry half the number for when they join in conception they unite, making one cell carrying the full complement.

Chromosome Counts: The number of chromosomes in each cell varies with the type of individual, man for instance has 23 pairs, a total of 46. A *Cymbidium* orchid has 20 pairs, a total of 40. The normal cell carrying two of each chromosome, which decide heredity, are called diploids, "di" meaning two. When the nuclei come together to be fertilized

A farmer is naturally interested in breeding plants and animals. It is necessary in his business. Therefore having farmed for over 40 years and a portion of the time operated both a stud cattle herd and sheep flock, breeding was my business and hobby. Now retired, I can continue my interest by the study of the creation of new flowers, with special reference to orchids.

I am sure that you would like to look with me at several methods that can be adopted in developing new varieties through discovery, selection, hybridisation and mutation.

Discovery: Here all of us can take an active part, especially with the seedlings that we grow. Even though the parents of the modern hybrids are usually quite good and the resulting newly created flowers from these seedlings may be beautiful, the percentage of champions is very small. Because of this, the discovery of something outstanding is a thrill indeed. These discoveries should not be lost and propagations from them should be attempted. The Orchid Shows have their uses in allowing the discoverer to let others see, and later, probably the opportunity of getting a propagation. It is hoped that where possible, these discoveries are used as parents of future champions.

Not only can the discoverer make good finds in the orthodox, but sometimes the discovery of mutation can produce something very unusual, whether it be in colour, shape or growing habits; so keep your eyes open for them and see that they are preserved.

Basic information to help in selection and hybridisation: If we decide to create new plants it is a help to us to know something of how growth takes place. It all begins with that great creation—the living cell—of which all living things, plants and animals are made. That great Creator, who is the beginning and controller of all, left nothing out. Let us examine it. For our purpose we do not need to

to form an embryo, only one set and therefore one half of the number of chromosomes contained in the cells of each parent is transmitted. This union contains the normal number of chromosomes, thus the characteristics of both parents have been transmitted to the new life.

Hybridising: It is fortunate that with plants all members of the same group or family will cross-breed and we are able to produce new hybrids. In orchids, one genera will cross with a different genera if they belong to the same group, thus making orchid hybridising particularly interesting and rewarding.

Dividing the clone: Having created a new plant, which being an individual is called a clone, one can in almost every case divide it into many plants. In the case of the orchid this is usually done by straight division, then vegetative buds, that have remained dormant sometimes for years, will become active. The flowers from the division will be identical with the flower of the clone from which it came. In fact, even though one division may be in England and another in New Zealand, they remain the same clone. Division by the meristem method is employed of recent years and is the cause of allowing many people being able to obtain the best of flowers at a modest price.

Mutation: Many fine plants have come into being because of some abnormality appearing on the plant. If these mutations take place on cells which are in a position where it will divide to grow, it is possible to produce more plants which are continuations of the mutation. In other words, if the mutation has a vegetative bud on it, that bud will continue to grow.

If on the other hand the mutation appeared on one flower on a plant, its cells have ceased to divide where the mutation took place and no further promotion of the flower is possible. However if the mutation is within the sex cell of the same plant, self-pollination may make possible the creation of a new clone but as in the case of any seedling it is a gamble what flower is produced from the embryo creation.

Earlier in this article I mentioned that a Cymbidium orchid has contained in its cell 20

pairs of chromosomes. Although the total per cell is 40, there are only 20 different hereditary characteristic promotions. There are two of each. However, mutation has produced clones containing four sets of the 20 making a total of 80 per cell. These are called tetraploids "tetra" meaning four. Because of this, when a diploid flower is used to breed with a tetraploid, only half as many hereditary characteristics are transmitted from the diploid as from the tetraploid. Hybridisers are able to make use of this factor in the production of new flowers. Unfortunately, as the cells of the cross contain three of each kind of chromosome hereditary character, these triploids as they are called, usually fail to breed. The reason being that during fertilizing only half of the chromosomes from each sex cell are transmitted to form the new cell of the new embryo. One half of three cannot take place and is usually barren.

Induced Mutation: In the plant world nature changes existing forms either through cross-pollination and subsequent selection or through mutation. Induced mutation can be obtained by the use of a chemical called colchicine, a substance found in the autumn crocus (colchicum). It is poisonous and should be handled carefully. It has the unusual ability to double the number of chromosomes in the plant cell. Diploids become tetraploids. Bulbs, seed or plants can be immersed in a dilute solution of colchicine. I understand that one part of two per cent solution to nine parts of water is the mixture for immersion treatment for about two days. After exposure wash and plant. The immersion treatment is a shock to the plant so baby it afterwards; keep warm and out of the direct sun.

Some factors in breeding: New creations must be made continuously to keep up young stock. In breeding an endeavour is always made to produce new plants which will be better than the parents. To this end commercial breeders are continuously working, very heavy culling and careful selection makes possible the promotion of the best. Once a good plant is produced there is no end to the number that can be duplicated, especially since the meristem culture has been established.

PLASTIC versus TERRA COTTA POTS

By Russell Martin of Australia

Having now used plastic pots on the entire orchid collection for more than 10 years, it can be said without doubt, that growth results leave nothing to be desired, providing that the soft (P.V.C.) black plastic pot is used and the potting mixture blended for use in conjunction with them.

When my orchid growing began in 1946, terra cotta pots were in general use, with a tan-bark mixture and fowl manure—used in large quantities. The old theory then was to crock one-third of the pot, thus reducing the active growing area of the pot. It was also widely practiced to water well and allow the pots to dry out before watering again.

Due to the evaporative properties (cool-gardie safe) of terra cotta, the pots became very cool on a windy day and rapidly dried out. Once an orchid root reached this stage and the active root tip seals off, it takes some time for re-growth to begin again after watering. Terra Cotta also absorbs salts, which is evident by the white scale residue on the outside and base of the pots. This in turn becomes toxic after a period of time and eventually becomes detrimental to plant growth. Another disadvantage is, as one ages, the weight of the terra cotta pot, compared with its plastic counter-part.

With plastic pots there is no need for crocking and the whole area is utilised for growth. It is however advisable to use a wad of bracken-fern, tree-fern, or pine-needles in the base of the pot, to avoid the mixture being washed out of the drainage holes. Mixtures should be open to allow free drainage and should contain one-third of their bulk as coarse sand. Plastic never allows the mixture to dry completely and contrary to many early beliefs, plants in plastic containers can be watered heavily each day, without detrimental effects. Root growth is vastly superior in plastic pots and even in cold houses, root growth does not cease during cold winter months. As plastic is non-absorbant, there are no problems with salt

build-up and if black plastic is used, the heat retaining properties ensures that the plant does not become excessively cold, as is the case with terra cotta. Plastic also has an undetermined quality which is associated with static electricity and this could have some added advantage yet unsolved, which could assist plant growth.

SEEDLING OR MERICLONES

QUESTION—Some growers say that mericlone plants need culture different from seedlings ex flasks. Is this so? If so, what essential differences are to be noted.

Answer—A seedling is produced from a single immature cell which does not complete manufacturing its in-built chemicals and hormones until it reaches maturity i.e., flowering.

A mericlone is produced from an initial isolation of adult cells which already possess these inbuilt chemicals and hormones necessary for survival, and therefore has a definite advantage over a similar sized seedling.

Upon removal from flasks, seedlings must still be regarded a premature infants and the mortality rate can be very high if conditions are nt perfect.

However, the mericlone being of adult structure, recovers much more rapidly from the initial shock of removal, and in most instances is ready for potting into single tubes some four to six weeks after the removal from flask.

Orchids are members of one of the largest plant families in the world, coming second only to the daisy. They grow anywhere from the frozen tundra of Alaska to the chilly, wind-swept meadows of Patagonia (the farthest tip of South America) and even in the hottest deserts of Africa.

CYMBIDIUM ORCHIDS: PEST AND DISEASE CONTROL

by Joy Amos

PART 5

Vine weevil: Cream-coloured larvae occasionally found damaging roots, or orchids.

Control: Drench mix with diazinon or repot into fresh mix.

DISEASES—

Pythium ultimum: A water mould causing "damping off" of seedlings and meristems in community pots. Also attacks older plants, causing blackening of pseudobulbs.

Control: Good hygiene and careful watering to prevent infection. When removing from flasks or community pots, disturb roots as little as possible. Plant into sphagnum moss, which is sterile. If symptoms of damping off appear, drench with Terrazole e.c. at lowest rate recommended or with Captan. In older plants cut away infected tissue and allow the plant to dry out. Repot, drench as before, then water carefully and keep humidity to a minimum. Do not syringe or water overhead.

Phytophthora omnivora: Black heart rot. A water mould. Spreads rapidly. Lesions sharply defined. The entire leaf falls in a few days.

Control: As for Pythium.

Erwinia caratovora: Bacterial soft rot. Brown to purple watery decay of pseudobulb. Usually a wound pathogen. Warm humid conditions favour the disease.

Control: Cut away damaged tissue. Dust wounds with copper-oxchloride. Reduce humidity.

Sclerotium rolfsii: White mycelium at base of stem. Very small hard yellow sclerotes may be found in the mycelium later. Infection develops in hot humid conditions.

Control: Difficult. Isolate infected plants. Cool airy conditions. Cut out and burn infection if possible. Drench with benomyl. Destroy plants unless it is essential to keep them.

Cercospora odontoglossi: Leaf spot. Irregular dark-coloured lesions on under-sides of leaves.

Control: Lower humidity. Increase ventilation. Cut off and burn severely infected leaves.

Spray with Captan, Zineb or Feioam (NOT benomyl).

Botrytis cinerea: Grey mould. Ghost spots on petals. Tip burn of leaves.

Control: Ensure good air movement with ventilation and fans. Prevent condensation of moisture on the plants, with heat and ventilation. Water carefully, early in the day.

Spray with Benomyl, Captan, Thiram, Dichlofluanid.

Glomerella sp. Dieback from tip of leaf.

Control: Remove and burn damaged tissue. Lower humidity and improve air circulation as for botrytis. Spray with benomyl or copper oxchloride.

Gloeosporium sp.: Leaf spot. Circular or oval brown or grey sunken spots. Can kill leaves.

Control: As for glomerella.

Cymbidium mosaic virus: Mottled mosaic pattern in the leaves, with some black areas. The initial infection may be severe in a ring-spot pattern. Sap-transmitted by knives, cutters, and by propagation from infected plants.

Control: Grow virus-free plants in isolation from plants of unknown virus status.

Sterilise cutters when harvesting blooms and when propagating by division or back bulbs.

Sterilise in a flame or use a new blade or scalpel for each plant. There is no chemical control of virus.

New growers are recommended to start with virus-free plants and to refrain from introducing any plants of dubious virus status, however desirable they may be in other respects.

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SOME NEW ZEALAND ORCHIDS

by Jim Forrest,
19 Fairview Place,
Te Puke.

Pterostylis are the most popular and easily grown genus. In New Zealand they are usually called "Greenhoods," but have a picturesque Maori name, "Tutukiwi," recalling the resemblance of the long curved dorsal sepal to the beak of the kiwi.

The name Pterostylis comes from the Greek petron, meaning wing and stylos, style which refers to the wing-like extension on the column of these orchids.

Pterostylis flowers consist of a galea, or hood, composed of the dorsal sepal which is united with the petals. The lower sepals which are fused for part of their length, curve upwards on either side of the galea like "antennae." A narrow labellum, dark in colour protrudes through the opening between the galea and sepals. When it is touched it flies back trapping the insect between it and the column. The insect can only escape by climbing through the opening between the column wings. Here the pollen masses get stuck to its back.

A delicious nectar invites the insect to the flower and you can find "drink" insects inside greenhood flowers. As natural hybrids are rare, presumably each species has its own means of attraction or the insects believe in keeping to the same brand.

Pterostylis begin to flower in late autumn and some species flower well into January.

PTEROSTYLIS SPECIES

The genus Pterostylis can be divided into two sections—those with several flowers.

The multiflowered group normally produce more than one flower, and these tend to be more hairy. They also unfortunately, as if to make up for the floral excess, often do no more than replace the old tuber each year.

The single flowered group rarely produce two flowers and such specimens must be regarded as freaks (I have a Pt. banksii which does). This group make from one to five new tubers so a large colony soon forms.

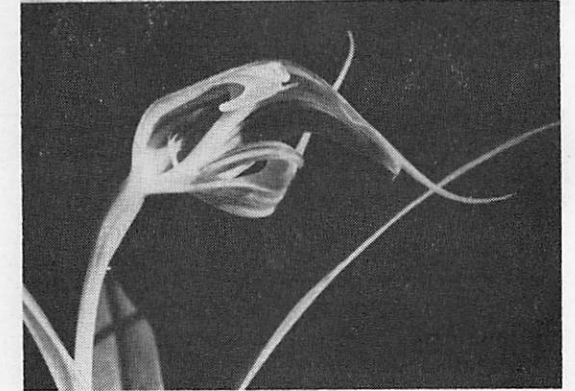


Photo: G. Fuller

Cross Section of Pterostylis showing narrow labellum in open position.

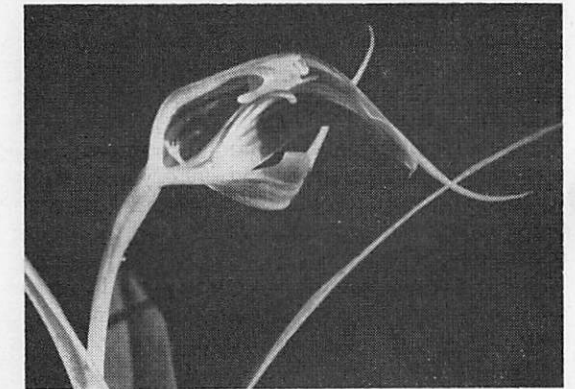


Photo: G. Fuller

Cross section of Pterostylis showing labellum in closed position.

A further way of dividing the single flowered group is between those that flower from a rosette, and those that produce a slender stem when they are going to flower. In the first group the flowering rosettes are the same as non-flowering ones. The other group is usually called the cauline (borne on a stem) group. In this group non-flowering plants form a rosette, while flowering ones send up a stem with narrow sheathing bracts, or narrow linear leaves.

CULTIVATING PTEROSTYLIS

For the most part they are easily cultivated. I grow mine in sand to which I add leaf mould and very old saw-dust. Good drainage is a must. I have found plants growing naturally in bogs, but they would not survive this way in a pot. Crock the pot well and cover with dry leaves, etc. to stop the mix blocking the drainage. Because our area is all pumice, I put a handful on top of the crocks for drainage. Also I believe terrestrials often grow near the surface, drawing nutrients from surface litter, but they reach down into largely poor material.

The tubers are generally more or less round ranging in size from a few millimetres, to over a centimetre. Large plants like *Pt. banksii* have large tubers and vice-versa. Bury the tuber two to three centimetres deep for large tubers, more shallow for smaller plants.

I use either clay or plastic pots, but if the latter you need to be more careful with the watering. With a large plant like *Pt. banksii* I put six tubers in a five-inch pot.

A massed display is most attractive, but this involves larger pots and once you get up to 10-inch pots and above the problem of rotting becomes acute because of the bulk of material.

Some species multiply quickly so I repot each year, others I just scrape off the top layer and add fresh material. Do not keep them more than two years in the same pot.

Repot early in the year as *Pterostylis* have a shorter rest period than most. Do not leave the tubers out of the ground, if you must, cover with dry sand or similar material. After repotting I place the pots in a cool shaded place under the benches in the shade house or the basement of my house. I keep a frequent

check on them as soon as shoots appear, they must be brought out into the light and watering started.

All my terrestrials are grown in a shade house because they burn in strong sun, but mainly to control the water, particularly in winter. We get torrential rains here, but it does no harm to put your plants out in a light rain.

I water from below in the cooler parts of the year because damp foliage on a cool night easily rots off.

If there is no sign of growth by April, I start the plants on the cycle anyhow but water very carefully until they do appear. Never let the pots dry out once growth has started or they may not flower.

When they are well in growth I find that they respond to light feeding with soluble fertilisers.

Once flowering is over do not dry the pot off or remove the foliage as this is when the new tubers are formed. The plant will let you know when it is ready to rest (late spring-early summer), then is the time to dry them off. Do not dry them rock hard, but it pays not to water until the next cycle starts. I store mine as I said in the basement.

WHERE CAN YOU SEE PTEROSTYLIS?

Pterostylis are found throughout New Zealand, from the North Cape to Stewart Island. They grow in partial shade, under low scrub or bush and can frequently be found among the grass on roadsides. Some species are found at low levels, others in the hills, some occur from sea level to a few hundred metres.

SOME COMMON SPECIES OF PTEROSTYLIS

Some 20-odd species are listed for New Zealand in the "Flora of New Zealand," but some of these are rare and local.

***Pt. banksii*:** Is one of the largest of all *Pterostylis* and fortunately common and easy to grow. The flower is large (up to eight centimetres long) green with white stripes and orange sepals. Grows in scrub in shady places throughout New Zealand. Flowers September-January.

***Pt. trillifolia*:** This is one of my favourites. A small plant usually found in large clumps. It grows from a rosette, the leaves of which are prettily veined. The sepals stand up giving the flower the look of an elf from the front.

My first imports came in long before the new regulations, and passed inspection, so were placed along with the rest of my collection. When I decided to import another lot the new regulations were being talked about so I built some polythene covered quarantine units into a new fibrolite hothouse and installed an under-sand heating cable to keep the units up to Phalaenopsis temperature. The second lot of plants arrived prior to the enforcement of the regulations so I expected they would be given the customary inspection and passed.

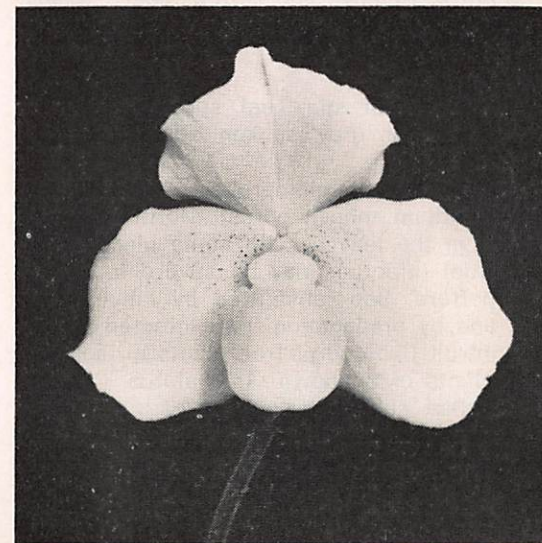


Photo by G. Fuller

Paphiopedilum niveum

However, it was a very enthusiastic young Port Agriculture Inspector who handled this shipment and he felt that some of the plants were virused and insisted that they be sent to the Plant Diagnostic Station at Levin. This of course was disappointing but it raised an interesting point as I had read in articles by

world authorities on *Paphiopedilum*s that they had not been proven to have virus. In about two weeks the plants were returned with a clean bill of health but for some reason I will never understand, the young inspector insisted that the shipment should be quarantined for a year. As I intended to import further lots of plants and did not wish to get in the Departments' bad books I meekly accepted the directive and placed them in one of the quarantine units which was in a fairly shaded position.

About three months later I noticed that the more recent imports were looking much better than the plants which had been there longer and on closer inspection I noticed that the leaves of the quarantine lot often had what looked like perspiration on them. It then occurred to me that the humidity must be very high and combined with the extra heat in what was now my *Phalaenopsis* house, they were really thriving. Within another month or so I began to see flower spikes developing on the quarantined plants and that really convinced me. I moved the first lot into one of the other quarantine units and they have grown much better with many making two flowers per spike and one, *P. concolor* had three flowers on the one stem.

With this method of culture the plants need watering about once a week as they seem to draw a lot of their required moisture through the leaves from the humid atmosphere.

The word "orchid" from the term orchis, may be traced back to Theophrastus (370-285 B.C.), a pupil of Plato and Aristotle and the name passed into the herbals of the middle ages. Gerard's Herbal 1633 and Parkinson 1640. By the late Eighteenth Century the first introduced orchids were recorded as being cultivated in England. In 1856 John Dominy became the first man to flower a man-made hybrid.

THE BELLATULUM GROUP OF SLIPPER ORCHIDS

by J. Campbell,
12 Norris Street, Prebbleton,
Canterbury.

This most endearing group of Paphiopedilum orchids has a relatively wide distribution centering round Thailand and the Malayan Peninsula and its islands. Quite a number of these species grow in cracks and eroded pockets on limestone cliffs overhanging the sea from just above the salt spray area up to about 20 metres. They are subjected to constant humidity which is reported not to drop below

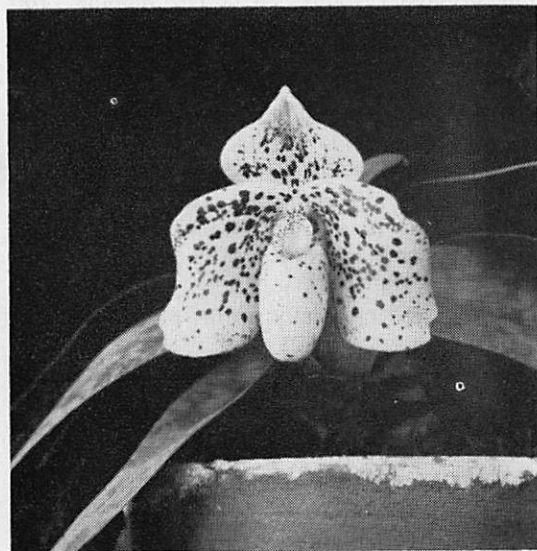


Photo by G. Fuller

Paphiopedilum bellatulum

85 per cent. and in that part of the world fairly constant high temperatures. It is interesting to note that many of this group have quite thick fleshy leaves almost like succulents and appear to have the ability to store up moisture and become quite flaccid as they use it up.

My first import of this group came from Thailand back in 1972 and included *P. niveum*, *P. ang thong*, *P. godefroyae*, *P. bellatulum*, and *P. concolor* which are most of the species apart from a few varieties and of course the quite rare *P. delanatii* (which I have been fortunate to acquire since). These jungle collected plants were quite knocked about with torn roots and bruised and broken leaves so I soaked them in a bucket of fungicide and insecticide solution with a tablespoon of honey per litre added. This honey trick was picked up from an old publication and is supposed to act as a pick-me-up and considering that the symbiotic mycorrhiza fungi living in orchid roots are presumed to convert plant foods to sugar for the orchid's use, then it may be quite beneficial. I have treated all imported plants in this manner and then I dry them out for a day or two before potting up.

As these orchids grow in very well drained localities with restricted root runs, I chose a well-drained medium and eight centimetres clay pots. I use equal parts of two centimetres long, coarse fern fibre and forest floor leaf mulch which contains a good proportion of native bark and put through an old sieve made from half-inch bird netting. I add two cupfuls of one centimetre limestone chips per bucket of mix and then remove all the fine material using a flymesh sieve.

One sometimes has difficulty getting long roots into small pots and it may be necessary to clip a few but the more left the better, and if a long-rooted plant is held over a pot and the pot revolved as the plant is lowered the roots will spiral round and usually fit in quite nicely. This free type of potting medium will work down among the roots very well if the pot is tapped or shaken as small amounts are added. I put a little sprinkling of dolomite lime around the plant after it is potted up and again every six months.

Found in shade in lowland bush, mainly in the Auckland province. Flowers from May to October and is thus one of the earliest to flower.

Pt. graminea: In many ways a smaller edition of *Pt. banksii*. Found in similar localities and flowers from September to January.

Pt. nutans: Very uncommon in New Zealand, probably the most common in Australia. It is easily recognised as the flower hangs down, hence its nickname, the nodding greenhood.

Pt. mutica: Is one of the rosette type with several small green flowers. Found mainly in the central North Island, it flowers in summer.

Pt. barbata: Is a member of the nifous group, a difficult one to cultivate. It has flowers like a running bird, and a labellum which is erect but thread-like. The labellum is covered in golden hairs. Flowers October to November.

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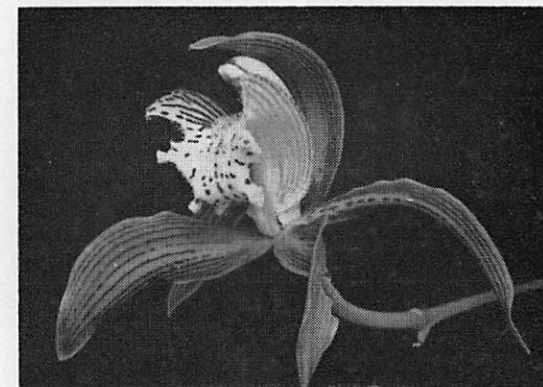
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Cymbidium tracyanum (Rolfe)

Burma and Northern Thailand are the home of this striking species. Growth habit is very robust and the broad pale leaves of this species are very persistent which means that it makes up well into large specimens which are even handsome when not in bloom. In some cases I have noticed that a proportion of the roots have the peculiar tendency to grow vertically upwards, a point which can help in identification.

The emerging flower spikes are particularly difficult to detect in early stages since they are concealed in the leaves surrounding the pseudobulbs but their presence is not secret for very long for they elongate at a rate unexcelled by any other Cymbidium. The spikes are far more attractive if left as a sweeping arch, otherwise the blooms look a little like a tribe of monkeys climbing up a pole. Up to twenty may be produced per spike, creamy—green, overlaid with brownish red stripes and spots. The labellum is yellow with crimson spots and stripes and notably hairy. They are fragrant but comparatively short lived.

It is interesting to recount that this species entered cultivation in mysterious circumstances, having been imported with *C. lowianum* with which it shares its habitat. It flowered for an unsuspecting Mr. H. A. Tracy of Twickenham in 1890 and was immediately awarded a First Class Certificate by the R.H.S., arousing considerable speculation as to its origin. George Fuller.

HINTS ON GROWING CYMBIDIUMS

by D. J. Langdale
of Yagoona, N.S.W.

Cymbidiums need sunlight, fresh air, water food and well drained compost to give the best results. Given these simple requirements in the correct proportion, Cymbidiums are amongst the easiest plants to grow.

Sunlight. They appreciate the full morning sun but require some shade during the heat of the day. Any method of shading that allows 60 per cent to 70 per cent of the midday and afternoon sunlight is satisfactory. This filtered sunlight effect can be obtained by the use of lattice laths, shade cloth, ti-tree woven into wire-netting, a trellis or simply a tree or shrub or suitable porch or veranda. Although I recommend 28 per cent light green ORCHID SHADE.

A mature, healthy plant generally shows a hint of yellow in the green of the leaves if it is growing well and receiving the correct amount of sunlight. Too much shade produces dark green leaves but seldom many flower spikes.

Watering: Never allow the plant to dry out. When the compost is dry at a depth of one inch in a medium-sized pot, watering is generally needed. Plants in small pots need watering more often than plants in large pots. Apply water plentifully when the plant requires it but do not keep the plant continually sodden. One heavy watering is better than several light waterings.

Compost: We recommend that a compost consisting of peat moss, rice hulls and sand is the best to use. In New Zealand pumice can be used to replace the rice hulls and sand—it is much lighter and easily obtained. Such a compost does not break down and because of this always gives excellent drainage and aeration. It affords a perfect medium for the roots to grow through and may be depended on to last for years. The composition of this compost is, in line with the findings of University of California research to find a compost for use by United States nurserymen. When used in plastic pots, no crocking is needed.

Feeding. Feeding of the plant is necessary at intervals of three to four weeks of sunny weather. During dull cold weather every five or six weeks is sufficient. Suitable complete plant foods are readily available from nurserymen and seed-merchants. Some are dissolved in water and applied after watering the plant. Others are sprinkled dry on the top of the compost in the pot and watered in. Decrease the Nitrogen content of the fertiliser between October and April.

Drainage: Good drainage of the pot is essential. This is automatic when using the compost described above. Composts which break down sometimes cause the drainage to block. If the water does not run freely through the pot after each watering, re-pot the plant immediately. Pots may be placed on benches or even on a couple of bricks to make sure that the drainage holes are kept open. Bad drainage will rot the roots and the plant will soon become diseased.

Ventilation. Good ventilation of the bush-house is the best guard against disease. However, Cymbidiums do not like windy, draughty conditions. Shelter from southerly and westerly wind is advisable. When Cymbidiums are grown in the open, a position on the northern side of an east-west fence or wall and on the north eastern side of a tree or shrub gives good results.

Pests. Well grown orchids are not particularly susceptible to disease but it is common sense to guard against the usual plant pests and diseases. Spray occasionally with a good all-purpose spray to which a little white oil has been added. When the buds appear, use an all-purpose dust. Use snail and slug baits and pellets when needed.

Potting: Do not be too ready to break up a plant. The best results are obtained by "potting on" as the plant becomes too big for its container. This means placing the plant undisturbed, into a larger pot and filling around it with new compost. Do this every couple of years until the plant becomes too big to

handle. This method of growing gives the biggest flowers and the greatest number of spikes.

When breaking up becomes necessary, break the plant into healthy three or four bulb pieces and put into smaller pots. Hold the piece to be potted with the base of the bulbs an inch or so below the rim of the pot. Fill loosely with compost and shake to allow the compost to fill in among the roots. As the shaking settles the compost, add more and shake again. Continue until the pot is filled and then firm gently around the edge of the pot only. Watering will consolidate the compost to the correct firmness.

When breaking a plant, disturb the roots as little as possible. Cut off any dead roots. Remove any leafless bulb (back bulbs) but leave one back bulb on any division less than three green bulbs. Remove the dead leaves and all roots from the back bulbs, taking care not to injure the shoots on the rhizome at the base of the bulb. Plant to about half the depth of the bulb in a box of peat moss and sand and keep moist. When a strong shoot and roots appear, pot the back bulb into a six inch pot. This growth from a back bulb should bloom in two or three years.

Breaking up a plant is generally done just after flowering and before the heat of the summer, or in February after the worst of the summer is over. Potting on the plant into a bigger pot may be done at any time in fine weather without risk. It is always best to break a plant when new green root tips are showing.

Flowering: Cymbidiums will grow well and flower freely under the conditions outlined above. However, for the more fastidious grower who wishes to obtain more perfect blooms a glass roof is an advantage. Whiting is painted on the glass to give shade or the glass may be lightly sprayed with white paint. This is a suitable shelter in which to flower your plants but it must be emphasised that a glass house or roof is not a necessity to the successful growing of Cymbidiums. Shade cloth can also be placed over glass, this saves painting the glass.

Red and pinks generally benefit by plenty of sunlight. This intensifies the colours. When

the first flower opens, place the plants in shade under the glass roof or in a sunroom out of the direct sun, as the sunlight will "wash out" the colour when the flowers open fully.

Most yellows and browns will take more sunlight than the other colours. Plenty of sun on the buds and flowers often results in attractive autumn colours. Yellows, particularly, benefit from the morning sunlight.

Greens should be placed in shade (for example, cheese-cloth under shaded glass) as soon as the buds begin to emerge from the sheath to obtain a clear green. If left in more sun some greens burn to give a bronze colour and some turn to lime and yellow tints.

White will be clearer if given almost as much shade as greens. Most whites will flush with pink if given more sun and sometimes this produces really attractive blooms. Too much shade will produce smaller, weaker flowers.

However, only experience will teach the grower the best methods to adopt with individual plants in his or her particular location and glass roof or glass house or sunroom.

Finally, Cymbidiums are easy to grow and with a little care and common sense will repay the grower with a profusion of attractive long-lasting flowers.

Miniatures generally prefer plenty of light.

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A.G.M. Orchid Council of New Zealand to be held 10 April, 1976, Toorak Hall, Hamilton at 1.30 p.m.