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SEPTEMBER/OCTOBER 1980

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ORCHIDS OF NEW ZEALAND

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Photo by courtesy of George Fuller, New Plymouth

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INSPECTION BY APPOINTMENT

CONFERENCE COUNTDOWN

Information from Conference Headquarters

The 1980 Conference, now imminent, has been planned over the last 30 months. This Conference issue goes to press before our final registration figures are known, but it is clear that well over 600 Orchidists will assemble at Ellerslie Racecourse in mid-October — a number beyond what we anticipated when we accepted the invitation to act as the Host Society.

We did not know what to expect.

Would we attract mainly New Zealanders? Would overseas growers attend in significant numbers? Would we feature mainly New Zealand speakers, or would we be able to attract international figures in the orchid world?

The whole picture developed gradually from its start in late 1977, and we now have the result: A top-flight panel of speakers from around the world, many overseas registrants, and a very large number of New Zealanders also attending. The biographical notes from our speakers appeared in the last issue of 'Orchids in New Zealand.' The papers they are to present are now with our printer and will be available to all registrants in the Conference satchels.

The satchels will also contain your Conference badge, your name badge, the tickets or invitations for the various functions you have nominated to attend on your registration form, maps of the city, brochures containing information you may need during your stay in Auckland, and a number of small 'extras.'

Our Auckland travel agents, South Pacific Travel, have spent many hours with our Conference Committee planning full and half day tours during Conference week. The local tours feature such points

of interest as Parnell Village, the Museum of Transport and Technology, (a unique establishment well worth a visit), native orchid territory in the Waitakere Ranges, a harbour cruise which will include a visit to Rangitoto Island (weather permitting), and a rural day in South Auckland. The many gardens of Auckland are included in the half day tours, and we should also mention that the greenhouses at Ellerslie will be open to our visitors during Conference week. If you have not booked for some of these tours on your registration form, don't hesitate to enquire at our Information Desk at Ellerslie, if you would like to change your mind.

South Pacific Travel have also been responsible for arranging the pre and post-Conference tours through New Zealand.

Another success story is the number of Societies who are competing at the Show. We have a large and most attractive venue, but it is going to be overflowing with orchids. The Australians have entered several exhibits in Class 1, and together with the New Zealand entries, our Show Committee have had to make numerous re-arrangements (a foot or so here and there) to accommodate you all. It is a great compliment, and we hope for the widest array of genera ever

seen under one roof. The early flowering precipitated by an uncommonly mild autumn and early winter has been something of a challenge, and not the weather we ordered for Conference year — then again, the strict limits on the size of each stand call for a much smaller collection of plants than most spring shows mounted by Societies and we don't anticipate any shortage of flowering plants for the 40 and 80 sq.ft. exhibits in Classes 2 and 3.

The keen competition prevailing today in orchid culture is reflected in the number of entries in Classes 4 and 5 — "Best Display Joint or Individual" and Best Display by a Commercial Orchid Grower" respectively.

A further feature at Ellerslie will be the commercial selling area on the first floor. The trading table at all shows is a big attraction with the public and these stands sold out very rapidly to orchid growers and those dealing in allied merchandise. There will be a book stall in this section, a stand selling pottery, and another with leather goods. The balance of the commercial stands, 20 or so, will almost all be trading in orchid plants, or orchid equipment.

On the ground floor, the Show venue, you will also find the Information Desk which will be manned throughout the four days, a stamp display featuring orchid stamps through the years, a corsage table, and the sales table for Conference souvenirs. Our calendar has already attracted wide interest, we are delighted with our coasters, and both souvenirs have been pre-sold through Societies. We hope the souvenirs we have selected will be memorable ones.

Registrations will be handled at Ellerslie on Tuesday and

Wednesday, October 14 and 15, from 9 am to 4 pm and we hope you will be able to check in during those hours if at all possible.

The Conference Committee, in the early planning stages, has been greatly heartened by the practical assistance offered in the form of what could perhaps be termed bridging finance.

Our final appeal is that your manual labour, as already requested through Society Secretaries, will be forthcoming. Our publicity team is working hard to attract many thousands through Ellerslie during the four days of the Show, and we will need all the help visiting Society members can give us in keeping a watchful eye on exhibits and slapping inquisitive fingers!

Work rosters are being prepared for two hour shifts in various areas from names submitted to us by Secretaries. Even if you are not officially rostered, you are all orchid growers, and will be able to impart basic orchid growing information to any of the public who may require it. All assistance will help make this International Show the success we have aimed for.

Exhibits in the Show venue on the ground floor may be set up from 1 pm on Tuesday, October 14, during the evening up to probably about 8 pm and on the Wednesday morning through to midday. Judging commences at 1 pm.

The commercial area stands will have two full days, Tuesday and Wednesday to set up.

The Conference Committee is holding weekly meetings, and has been for some months, attending to last minute arrangements. We believe everything is going very smoothly.

We have the registrations, we have the exhibits . . . all we really need now is for the best orchids to flower at the right time, and one week of perfect weather!

The above article is the last of a series written for the magazine by Beverly O'Dowda, Publicity Officer for the North Shore Conference Committee. Beverly has endeavoured at all times to keep our readers informed of Conference matters as they have come to hand. Writing articles at any time is not easy but to do this in conjunction with the Publicity Officer's job warrants a special mention. On behalf of the magazine committee I say 'thank you Beverly.' —Ed.

COOL HOUSE TOPICS

*by Phil Mayhead, 360 Carrington Street,
New Plymouth*

SPRING

This is one of the most interesting periods in the glasshouse, and one of the busiest. Many plants are in full flower and with more spikes to open it can be very exciting. The Shows are in full swing, and this year there is the "Big One" at Eilerslie.

Potting

This is the main repotting season, as the best time to repot many genera is when the new growths appear and the flush of new roots are showing. This ensures that the roots quickly establish in the new mix, and the shock of transplanting is minimised. In fact, I believe with the new bark mixes that the plants scarcely know they have been uprooted.

In repotting, tip the plant out of the pot, trim off dead roots, remove unwanted back bulbs and shake out the old mix from around the good roots at the growing end of the plant. Choose a pot that when the older part of the plant is held back against one side there is room for two new bulbs at the growing end, which gives, for most genera two seasons growth. The same size pot can often be used for mature plants.

Species that have been resting over the Winter months, this includes Autumn and Winter flowering sp. such as *Laelia anceps* (which is one of the most rewarding plants for the Cool House) *Odontoglossum rossii* and some *Oncidiums*, are best watched and when the new roots and/or growths are seen then repot if needed. There is no set time, as individual plants come into growth at different times each year.

Have a look at plants that aren't being potted to see if they have sufficient bulbs to support the new growths, any excess old bulbs can be back-cut through the rhizome and left in the pot, and next season you may well be rewarded with an extra plant. See P.52, Nov-Dec 1979 "Save Your Species") for more details.

Shading

This should be applied to the glass now as the sun is rapidly increasing in strength.

Remember we have had little or no shading over Winter to ripen the bulbs and canes, but this strength of sunlight will be too strong and will burn the more delicate new growths. Damping down will have to be increased to about once per week, or as the glasshouse conditions warrant, more often if there is a hot and dry spell of weather.

Staking

One thing that spoils a well grown plant is poor or absent staking of the spikes. It is too late to prop them up when the flowers are opening, but rather they should be trained from when they are quite short. This applies to cymbids, odonts and genera that have semi-erect or arching spikes.

When the spikes of cymbids are cut off, the plants can be potted if necessary and then placed outside in their Summer home. This column is not really "geared" towards cymbid culture as I grow only cymbid species and a few mini-hybrids and I feel a column of cultural notes about cymbidiums written by a cymbid expert is urgently required in this Journal.

CYMBIDIUMS

Seasonal Culture

by P.C. Tomlinson

Those of us growing Cymbidiums will now be experiencing the fruits of our culture. It is hoped that everyone has a "forest" of spikes revealing themselves on the mature plants in our collections as a fitting conclusion to a year of effort. The early clones will already be showing their splendour, but the flush of the flowering season is still to come, and much can still be done to ensure the efforts of the previous months produce the results so eagerly anticipated.

POTTING

No repotting should be undertaken at this time of the year, as there is not the root activity to

ensure rapid re-establishment of the plant. Any necessary repotting should have been completed by the early autumn, and none should now be undertaken until the spring. The only exception to this rule involves sick plants, where obviously root rot has occurred, and where problems with the potting mix are apparent, through it having broken down. It is a matter of accepting the risks of repotting in those circumstances where this is considered less than allowing the ailing plant to remain in an unsatisfactory condition. Such a repotted plant should be kept in a warm area if at all possible; especially given bottom heat if available to allow the essential root re-growth to occur.

TEMPERATURE

Cymbidiums can be grown without supplementary heat in winter, but should be protected from the worst of the elements. Ideally plants should be brought into a porch or glasshouse, but can remain outside if covered, for example, by a sheet of plastic to divert the worst of the rain. Plants not in flower can withstand low temperatures, even down to freezing, although should be kept above 5°C if possible. Flower spikes are much more vulnerable to low temperatures, and plants in spike should not be allowed to fall to these low temperatures if possible. If it is anticipated that the plants will be exposed to low temperatures during the winter months, then it is generally desirable to utilise a coarser growing medium; one that allows most of the water to drain away and which can be kept fairly dry during cold conditions. If a plant's roots are kept wet by a tight mix during cold conditions, growing difficulties can be experienced.

To obtain maximum growth of young plants, they should be maintained at a higher temperature, say above 10°C. Should young plants receive a set-back over the winter, this can retard the date of their eventual flowering considerably. Once they experience a check it can be quite some time before their growth can be brought up to a satisfactory level again. The provision of bottom heat at this time of year will considerably increase the growth of mericlones, seedlings and back bulb propagations.

FERTILISING

As the growth of the plants will be at the lowest rate for the year, cellular activity will be at a minimum level. Under such circumstances the plant is unable to take advantage of any fertilisers, and therefore none should be supplied at this stage. When increased growing activity is apparent in the spring, then fertilisers can be applied with benefit; nitrogenous fertilisers being used to ensure maximum vegetative growth early in the new season.

WATERING

At this time of the year, with vegetative growth at a low level, the frequency of watering should be reduced. If relatively warm growing conditions can be maintained, then watering say once every seven to ten days will be adequate. If unheated growing areas are maintained, then the plants should be kept relatively dry. If wet and cold conditions are maintained at the plants' roots, root death can occur, which will reduce subsequent growth. The plants which have the warmer growing species in their breeding (such as some of the Asiatic miniature species, and standards such as *C. erythrostylum*

and *C. insigne*) will be more prone to damage under such conditions, and should therefore be kept warmer and drier. Root damage is often revealed by the loss of flowers at the end of the spikes; the plant being unable to support all the developing flowers where appreciable root damage has occurred.

Some orchid flowers can be disfigured if water is allowed to remain on them during the cooler weather. All watering must be completed during winter with care, some clones in particular being very easily damaged if caution is not exercised.

LIGHT

In the autumn the plants should have been gradually exposed to increased light, receiving full light by the mid autumn period. This ensures the pseudobulbs are fully mature for the subsequent flowering. Any increased light should be given gradually to reduce the risk of burning of the foliage.

SPIKE MANAGEMENT

As the spikes appeared, they should have been protected by suitable stakes. This helps to ensure they are not accidentally broken off during the handling of the plants. It also enables the spikes to be trained in the form required. Do not tie the spikes firmly to the stakes (unless the plant is being transported); rather just enough to retain it in a position allowing normal growth to take place.

It will be obvious that different plants naturally have different spike forms; some are held erect, some are gracefully arching while others are sharply pendulous. Any staking must allow natural spike form to develop as this generally will produce the most attractive display.

As the spikes elongate, the amount and direction of light can affect the presentation of the flowers. As the spikes grow, do not move the plant around any more than is necessary until the spike shape is set. This allows the spike to form a natural and more even shape. If the plant is turned around in relation to the light sources, not only will the spike become twisted and mis-shapen, but the presentation of the individual flowers on the spike will be uneven, producing overall a somewhat unattractive result, and one that will be sure to disappoint. If a plant is moved, ensure that it is always returned to the same position, or, if moved to another site, that it receives similar light conditions, with particular reference to the direction and intensity of light.

For even flower distribution and natural spread on spikes, an even light source overall is required, if one side of the plant is shaded and the other receives strong light, the spikes will grow towards the stronger light source; if most of the available light comes from above and little from the sides, longer spikes will be produced than would be usual, often having a growth habit that would not be natural for the plant involved. Unless it is wished to have the flowers all facing the one way, even overall light will give the best results. Imagine the plant growing in its natural environment. It stays in the same place and generally receives even light. Try and provide similar conditions in your growing area for the best results.

In the manipulation of the spikes, any alteration or training should never take place in the morning. The plant builds up moisture during the

night, and with the rising sap, the spike will tend to be brittle. When the moisture level falls later in the day, the spike will be more pliable, and will be more easily trained in the manner desired.

LIGHT AND COLOUR

There is a close relationship between the amount of light received by the plant, and flower colour. The requirements of each plant will vary in this regard, and must be considered and adjusted in order that the desired results are obtained. While experience with individual plants is necessary, the following general rules apply.

Flowers with the stronger red, brown and darker pink and brighter yellow colouration require bright light during the development of the buds for a maximum colour to be produced. Once the flowers are open they should, however, be shaded to stop fading of the colour occurring.

White, green and pastel coloured flowers should be completely shaded for best results. Green flowers in particular must be heavily shaded at all times for optimum colour.

As the spikes develop, never peel the sheathing leaves away, as the buds can be easily damaged.

PESTS AND DISEASES

During the winter, few problems should be experienced. If any difficulties do arise, use sprays on flowering plants with care. The developing buds are very sensitive and can be easily damaged by some preparations. The use of powdered rose dust is generally considered to be one of the most appropriate materials at this stage, generally quite safe but effective against the ailments commonly experienced.

SPIKE REMOVAL

Flowers are part of the plant's reproductive process. Obviously as they grow and develop they are drawing food and nutrients from the storage organs in other parts of the plant; the longer they remain on the plant the more nutrients will be removed. If the spike is left on too long, the plant can be affected to such an extent that flower production the following year can be reduced. It is therefore generally recommended that spikes should be removed some two weeks after the last flower is open. As it takes several weeks for all flowers on the spike to open, this gives a reasonable period for the flowers to be enjoyed on the plant.

Do not bring a plant in spike into your home before the flowers are fully open. If the night temperatures are above 14°C, this can cause the buds to yellow and fall off; once they are fully open this problem does not arise.

PRESENTATION FOR DISPLAY

Whether taken into your home or to meetings or shows for all to see and enjoy, some attention to final detail will ensure the presentation of the plant and its flowers is to their best advantage. With many months taken already to flower a plant successfully, taking a few minutes extra to prepare the plant to enhance its exhibition is surely well worthwhile.

- Ensure that the pot is clean with all moss, slime and dirt removed.
- Remove any dead leaves from the plant, also any old leaf bases from the pseudobulbs, generally tidying up the plant overall.
- Clean the foliage of old spray residues, dirt, dust, etc. Remember when wiping down the

foliage to hold the bases of the leaves and wipe from base to tip. The leaves, especially from the newer growths, can be easily pulled off if care is not exercised.

- Ensure the plant is correctly labelled, with the name of the plant and grower.
- Ensure that the staking is sufficient to hold the spikes undamaged during the transportation and staging of the plant at shows.

Enjoy your plants and their magnificent flowers. Please remember that others also would like to see your growing success at our monthly meetings and shows.

If you are experiencing any growing problems, do not hesitate to ask other growers they will be only too happy to assist if they can.

DONATION

A thank you to the person who donated (anonymously) the sum of \$50.00 towards magazine expenses. The money will go into our colour block fund.

Show Dates

TARANAKI

Fri. 19 Sept. 1.00 pm to 9.00 pm
Sat. 20 Sept. 10.00 am to 8.30 pm
Sun. 21 Sept. 10.00 am to 4.00 pm
Queens Hall, Gill Street entrance,
New Plymouth

WELLINGTON

Sat. 25 Oct.
Sun. 26 Oct.
Mon. 27 Oct

St Oran's College Gymnasium,
Lower Hutt



By George Fuller, N.D.H. (N.Z.),
Curator Pukekura Park, New Plymouth

POLLINATION OF CORYBAS MACRANTHUS (Hook. f.) Reichb. f.

Ever since reading, at an early age Darwin's great work of 1862, "THE VARIOUS CONTRIVANCES BY WHICH ORCHIDS ARE FERTILISED BY INSECTS," I have been most fascinated by the subject. There is a modern book on the same subject, most beautifully illustrated and even useful for identification of orchids. It is called 'Orchid Flowers — Their Pollination and Evolution' written by L. van der PIJL & CALLOWAY H. DODSON, published in 1966.

Reading these books and other snippets from here and there, it becomes very evident that the pollination of each orchid is likely to be an act with fairly prescribed conditions, much more involved than the conventional bee prancing over a flower in search of honey and one begins to realise that relatively little is known about specific details of how pollination occurs in the seventy or so species of orchids native to New Zealand. We can generalise and assume that insects or other lowly creatures are involved, but if research from other countries is a lead, then there is a wealth of fascinating facts

concerning the incredible affinities between orchids and their pollinators awaiting discovery at our very feet.

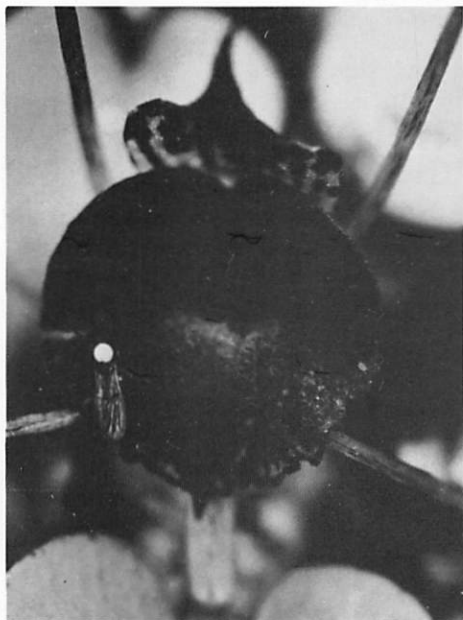
Patience and careful observation have helped me add a few stitches to what will eventually be a rich tapestry, for the spring of 1979 I observed and photographed pollination of *Corybas macranthus*., perhaps our showiest 'spider orchid.'

Since the orchid family is vast in both numbers of forms and geographical distribution it is not surprising that confusion in naming occurs. There is no exception in the case of the representatives from New Zealand so a clarification is required to ensure that identification of the orchid concerned is acceptable.

Most descriptions of *C. macranthus*. including that in 'Flora of N.Z.' by MOORE & EDGAR suggest that the leaf possesses a petiole (stem) which results in the flat leaves being thrust above the flowers, tending to hide them. The specimens in this survey, though tallying in other respects with botanical descriptions of *C.*

macranthus are definitely sessile (stemless) and consequently the flowers are displayed very prominently above the leaves.

This form is widespread in Taranaki if not elsewhere and is assumed to be correctly identified



as *C. macranthus* since it fits no other specific description.

The following observations were carried out on colonies introduced to the earth banks of the ferneries at Pukekura Park, New Plymouth. Although under the protection of glasshouses, there is no artificial heating. Flying insects have relatively free access.

Several species of corybas thrive in these conditions and in one area of vertical bank of approximately a square metre, *C. macranthus* & *C. orbiculatus* are growing densely intermingled, the latter coming into flower slightly later.

It was while inspecting this mixed colony on the 16th August 1979 that several mosquito — like flies were

noted bearing on their backs very neat spherical cream pollen masses. Although both species of orchid were in flower, the insects were only observed on *C. macranthus* and one was studied during its struggle to extricate itself from a flower.

I was very fortunate to be able to take several photographs of the insects, some with and others without pollen, but always associated with *C. macranthus* only. I was left in no doubt that I was observing the pollinator of this orchid, but how to get the fly identified was my next problem.



Armed with a tiny phial of preservative spirit, I had a remarkable stroke of luck on 26th August. A fly bearing a pollen mass alighted on the pointed tip of a nearby hanging leaf and 'plop!' It was mine. Try to imagine my excitement. First to discover, then to be able to photograph and finally to capture a specimen of the pollinator!

By the third of September, flowering was taking place of both species of orchid on the banks of the neighbouring glasshouse (No. 2) but here the colonies were not intermingled. A pollen-bearing fly was noticed on a late form of *C. macranthus* and R. Bickerstaff of Napier was on hand to photograph it.

On the ninth of September, several specimens were observed to be extremely active in No. 2 house and strongly attracted to the above colony but again, none to the nearby colony of *C. orbiculatus*.

No flies were seen bearing pollen despite being attracted to the flowers, though one was observed entering a flower.

This and another were caught and preserved.

Another specimen with pollen on its back was observed on a bloom of *C. macranthus* in No. 2 house on the eleventh of September but it eluded capture by flying off with its burden.

By the twenty sixth of September, the *C. macranthus* in No. 2 house seen being visited on the third of September had a well-formed seed capsule, as did many others in the colony, but there were none in the nearby colony of *C. orbiculatus*.

The three preserved specimens were sent to the Entomology Division of the D.S.I.R. where Dr Holloway found that they were fungus gnats. Strangely enough, three distinct species were represented and all were females. That bearing the pollen was *Mycetophila diffusa* Tonnoir 1927, one with a spot on the wing was *M. colorata* Tonnoir 1927 and the third was *M. subspinigera* Tonnoir 1927. It appears that little is known about these tiny flies.

Thus we have information about the pollination of *C. macranthus* but the disclosures pose more questions than they answer. Are all the species of the fly capable of transferring pollen? Are only females involved? Is each species of corybas reliant on one species of fly for pollination? Just how is *C. orbiculatus* pollinated? In its southern limits of distribution it is thought to be cleistogamous. (self pollinating.)

These and many other questions will be answered by individuals making patient and detailed observations. Guess where I will be, come September?



Orchids say "Thanks"

by C. W. Harman, Curator, Green Mountains
Botanical Gardens

It was in 1966 that the Green Mountains Botanical Gardens project was started. It was born of two ideas. Suggestions for ways to add to the attractions to bring people to the holiday resort of O'Reilly's Guest House, Green Mountains, Queensland, were being mooted and at this time large areas of privately owned rain forest were being clear felled, for grazing.

Now, here was a perfect opportunity to provide an added tourist attraction for the Guest House and at the same time save and re-establish in natural surroundings a large number of native orchids and other epiphytic plants.

First of all permission was obtained from the owners of the property to salvage and remove all we could from the fallen timber, before it was finally burnt. Over 6,000 Orchid plants were saved.

For the re-establishment of these plants, an excellent area of land adjacent to the Guest House was available. This area was completely surrounded by rain forest, and contained large boulders and trees ready to receive the salvaged plants.

What a pleasure it was to be able to put plants back into similar conditions from which they had come; no pots, containers, or artificial methods necessary here.

Orchids species saved included, *Dendrobium speciosum*, *D. gracilicaule*, *D. puglioniforme*, *D. schneiderae*, *D. teretifolium*, *D. linguliforme*, *D. tetragonum*, *Bulbophyllum elisae*, *B. exigeium*, *B. weinthalii*, *B. bracteatum*, *Sychochilus falcatus*, *S. spathulatus*, *Rhinerrhiza divitiflora*, *Calanthe veratrifolia*.

Naturally quite an amount of damage was done to the orchid plants during felling operations.

When huge trees came crashing to the ground, the orchids became just part of the debris. All the easily retrievable plants were first collected and loaded onto the waiting truck — even the tiny seedlings had just as much right to be saved as the big plants. The large plants, and those jammed under trunks and branches were a problem at first, but a chainsaw solved this, quickly clearing the way to get at the plants. Many were far too large to lift, let alone carry. Here the chainsaw was again used. Ever broken up an orchid plant with a chainsaw?

The worst damaged plants were those that had fallen victim to the bulldozer. These were really mauled, all mixed up with soil and litter, pushed in front of the bulldozer blade. Nothing must go unsalvaged. So these great heaps of rubble were searched for as many plants that could be salvaged, though I must say they were pretty sick and sorry.

All the plants collected were stockpiled in the area where they were to be established and then began the job of sorting and planting. The large plants were easy, just a matter of placing them on the boulders and the small plants were tied to the trees. Before any of the plants could be put into position, all damaged parts were removed, mostly this consisted of shortening broken and mutilated canes.

The plants that had been recovered from the piles of forest debris pushed up by the bulldozers were very wet and soggy. These were spread out in the sun for a few weeks to dry out, and then tidied up and planted. There was a hundred percent recovery and within twelve months, these plants were just as healthy as any of the others.

It is fourteen years since this project was started and all the salvaged plants have become fully established in their new home. As a matter of fact, it is hard to believe that they were ever growing anywhere else.

At flowering time in September — October, they are a major tourist attraction.

Most important, they were saved from destruction, and their way of saying thanks, is the large number of seedlings appearing on the rocks and trees. Each year more seedlings appear and some of the first have now reached flowering size.

New Zealand's Only Dendrobium

the lovely *Dendrobium cunninghamii*, Ldl.

by Ros Bickerstaff, 12 Enfield Road, Napier

New Zealand is proud of its share of the World's orchids, even though most have relatively small flowers. In this country we have 72 different species from 21 genera. Of these only six species are epiphytes. A large proportion of our orchids are shared with Australia and its neighbouring islands. With the N.W. Antitrade Wind as our prevailing wind, this is not surprising for orchid seed is finer than most dust particles, and even these are known to be blown across the 2000 km expanse of the Tasman Sea and be deposited in our country.

However, we have one species endemic to New Zealand, even though over 1500 other members of its genus are found in Australia and the East. How it arrived here, or how it originated is anyone's guess! this orchid is *Dendrobium cunninghamii*, Ldl. Although the flower is quite small (25mm) it is our most beautiful orchid. It has branching, pendulous canes which are usually up to a metre long, but, in certain sheltered areas, can attain two metres or more in length. Young canes are often erect, but arch and droop as they lengthen. The canes are slender (1—2mm) near the tips, but increase to 4—5mm at the base, with nodes at intervals of 3—4cm. From most of these nodes come branches, angled forward at 50—55°. Leaves are alternate, more numerous towards the tip, each having a sheath (c.1cm) and a leaf blade (c.3cm x 3mm). Small spurs develop midway from the lower axil to the top of the next sheath; these develop into flower buds. the flowers are usually white; sometimes they have small mauve-pink streaks near the tip of the petals and occasionally on the sepals, too. The petals are slightly wider than the sepals. The lip is white with an apple-green throat;

the side lobes are usually mauve-pink, and the main lobe is white, sometimes streaked with mauve-pink, and slightly crenulated.

This orchid is normally found as an epiphyte growing on tall trees. Occasionally, however, it is found growing on fallen logs. Through the depredation of animals and weather, these rarely survive more than a few years. On the shoreline of Waikaremoana, I found a fallen tree trunk, nearly a metre wide, with numerous large specimens growing on it. In addition, hundreds of young seedlings from 1cm to 10cm high almost covered the mossy bark. Three years later, I saw the same trunk. There were no live plants on it, only dead canes, and little clumps of withered roots, all that remained of the seedlings.

Dendrobium cunninghamii grows on a variety of trees, clinging to the bark, or lodged in the debris found in tree forks, especially those having clumps of perching lillies (*Astelia* sp.), or kiekie (*Freycinetia banksii*, A.Cunningham). In time, these clumps become so heavy that they break off in storms and tumble to the ground, where the plants die. To remain healthy, *Dendrobium cunninghamii* prefers to have plenty of light, especially morning sun, and

sufficient moisture to dampen the roots daily. This is why most of these dendrobium plants grow on the upper slopes of high hills bathed frequently by the rain clouds, or in places subjected to heavy dew.

I have found plants right throughout New Zealand, from Mangamuka, near Kaitaia in

without finding another plant, large or small, with alba flowers.

Young seedlings are slow to reach maturity. Some seedlings, collected in 1961 from a relative's farm near Galatea, flowered for the first time last January (1980). Also, some seedlings I gathered in Southland six years ago are now



Northland, to Stewart Island, and on both the eastern and western sides of the dividing ranges in both islands. They are also found on some of the islands off our coast.

Although fundamentally similar, there are numerous colour forms. These show up mainly on the lobes of the lip. Also, there are some variations in the tepal width and in the shape of the lip. I have seen alba forms in Northland, and again in the Urewera where they were growing alongside the common mauve-pink side-lobed forms. A couple of years ago, I found a clump of *Astelia* fallen from a rata tree. Among the debris was a host of plantlets of *Den. cunninghamii*, which I tried to save. Last year some flowered. One was an alba form, but the others had mauve side lobes. I have searched extensively in that locality since

only 5cm to 8cm high. They were only 1cm to 2cm high when collected. I still recall clearly how difficult it was to obtain these latter seedlings. I had stopped for a stretch in a bush area on the coastal road from Invercargill to Balclutha. I had walked to the edge of a steep bank. There, just in front of me, not a metre and a half from my eyes, was a *Den. cunninghamii* in full flower. Just below it, on the bark, were dozens of tiny seedlings. I was tempted. It was hopeless to try and reach over to them, so I scrambled down the cliff face, and then laboriously climbed the tree to where the seedlings grew. I selected five and returned to the car. It had taken nearly half an hour to get them. So close and yet so difficult to obtain. At home, I still have four husky plants growing strongly.

My best results are obtained when I grow plants in baskets lined with black horticultural plastic (to absorb warmth and retain moisture) and filled with leaf mould, fibre, bark and a little moss. At present, I am using drip irrigation. The plants enjoy these conditions. New growth is prolific. One of my oldest plants has over 1000 blooms each year during November—December. The flowering range seems to be from October to February. I have five colour forms growing at home, and hope that I might find further varieties among my unflowered seedlings, or upon some future trip into the bush.

Historical Background

It is surprising what facts come to light when one seeks to find out something about the man responsible for the discovery of this beautiful orchid, *Dendrobium*

scientific party which sailed with Captain James Cook. It was through Bank's influence that both separately had received appointments as Government Botanists to the Colony of New South Wales, which, at that time, kept an eye upon New Zealand's welfare.

In 1826 and again in 1838, Allan Cunningham (1791—1839) made visits to New Zealand. On his first visit, he had "been engaged to do botanical studies in the Bay of Islands area." He lists 589 new descriptions in his publications.

Richard, however, had taken service in the navy. In 1833, he deserted, and excited by the news of his brother's research and discoveries he, too, went to New Zealand. In 1834, it is reported in the writings of Allan Cunningham that Richard had collected a specimen



cunninghamii, Lindley, which perpetuates the name of its discoverer, Richard Cunningham (1793—1835).

But, who was this Richard Cunningham? There were two brothers, Allan and Richard, both keen botanists. These brothers were both well-known to Sir Joseph Banks, who was leader of the

of a new species of *Dendrobium* in the "North Island, near the sea." He further mentions that R. Cunningham found it in 1834, "at Whangaroa, growing on trees, pohutukawa." This plant was named by Lindley as *Dendrobium cunninghamii*, Lindley, and listed in "Botanical Register" 21, 1835. It is interesting to note that Charles

Darwin was also in the Bay of Islands area for a short time in 1835.

While Allan Cunningham was in New Zealand in 1838, he met, at Paihia, the missionary botanist, William Colenso, whom he trained in the systematic manner in which botanical discoveries should be recorded. Over 40 years later, on 11th August 1879, when Hon. Secretary of the Hawke's Bay Philosophical Institute, Colenso paid tribute to these two brothers "who may truly be said to have been martyrs to their favourite science — botany."

It is further reported in the "Transactions of the NZ Philosophical Institute" that Colenso had, in his travels near Norsewood, during the period 1879—82, found a variety of *Dendrobium* growing in pine trees (*Podocarpus spicata*). This plant he called *Dendrobium lessonii*, Colenso. It was later decided that it was just another form of *Dendrobium cunninghamii*, Ldl. (*Metrosideros tomentosa*, A. Rich)

Why had Colenso called them "martyrs to botany?" this set me doing further research. It appears that Richard, on his last scientific journey, had taken ill with pneumonia, from which he died. But, as yet, I have been unable to find out the cause of Allan's death.

It is little wonder that when our Orchid Council of New Zealand wanted a suitable orchid to head their correspondence, this beautiful *Dendrobium cunninghamii* was the one that was chosen for this honour!



Richard Cunningham was superintendent of the Sydney Botanic Gardens and in 1835 as botanist he accompanied Major Mitchell and party to explore the course of the Darling River into the interior. While on the expedition he was killed by aborigines when searching for plants alone.

His brother Allan, was then offered the job of superintendent — he took the post for a short time but found that the work was not satisfying. He returned to New Zealand to collect more species but contracted a severe chill and went back to Sydney to recuperate. He intended to go to London in 1840 but died in Sydney in 1839.

Their memorial in the Botanical Gardens is a beautiful marble win overlooking the waters of Farm Cove.

—Ed.

CHANGE OF SUBSCRIPTION TIME



As from July 1980 all subscriptions will become payable in June every year. July is the commencing date of each volume. For those whose subscriptions are due in June there will be no change. For those whose subscriptions fall due at other times of the year, a slip will be enclosed informing the amount due for the remainder of the volume. For example, if your subscription expires in February 1981, the enclosed slip will be a demand for two magazines only — March/April and May/June. As from June 1981 no slips will be sent out but there will be a tearout portion in the May/June issue for all renewals.

This will enable the magazine committee to budget for each following volume.

SOME PLANTS THAT I HAVE KILLED

by Don Richardson, Greentree, Manhasset, New York 11030

I have often said that I did not mind killing a plant if in the process I could find the reason for its demise. Unfortunately it is not always possible to find out the reason, or to learn what it needed.

Aerangis rhodosticta is one of my favourite orchids and it is quite rare, another reason why I do not wish to lose it. I had trouble until I read that it is usually found on small branches of trees overhanging waterfalls. At last I found the right spot hanging on the end of the intermediate house, facing North. One beautiful plant I managed to keep for over twenty years, it was mounted on a tree fern slab. Mr Mamman who had seen many in Kenya said it was the best that he had seen outside Kenya. A few months after his visit I noticed that the treefern was disintegrating, it was transferred to cork bark and promptly succumbed. I received two more plants which are doing beautifully on cork bark.

Aerangis rhodosticta is a striking miniature orchid with round, pure white flowers with anther caps of bright red, about twelve flowers to an arching spray, all on a plant under 15cm. Two selfed, fat seed pods, will I hope help to perpetuate the species. Another small plant of incomparable beauty and charm with arching sprays of bright orange flowers is:

Compantilla speciosa they spring from the base of tiny pseudo-bulbs, the leaves are leathery. I have had several plants over the past 25 years but could never seem to keep them long. In 1973 we collected it in Southern Ecuador growing on tiny twigs overhanging a swift river. Since seeing them in their pristine beauty, I have grown them on wispy

fragments of tree fern, where drainage is perfect. They are misted frequently, and for the past seven years they have been hanging near the *Aerangis*.

I have not been very successful with the Australian *Sarcochilus* with the exception of *Sarcochilus hartmanii*. The main difficulty has been in getting them established after their long journey. *S. hartmanii* seems indestructable.

Brachycorythis kalbreyeri the so called Sweetpea orchid is so beautiful in form and fragrance, they do resemble Sweetpeas. The plant is usually terrestrial with thick rhizomes. I grew one in *Cymbidium* mix for about ten years. Throughout the growing season it stood in a saucer of water in our cool house, it would be dried off in Winter. One particular plant in a large collection can be overlooked and this is what happened to the Sweetpea orchid. It comes from humid forests in Kenya and Sierra Leone. I have been unable to obtain another plant. So many *Oncidium*s are relatively easy to grow, however, a few present a real challenge. Perhaps the reason *Oncidium onustum* is difficult with me is because it comes from desert regions of Ecuador, growing on cactus while we maintain high humidity in our greenhouses. *Oncidium onustum* is a dwarf species with tufts of foliage, the scapes are slender, about a foot long, the flowers bright yellow, and comparatively large.

Dendrobium unicum perhaps better known as *D. arachnites* is difficult for me to keep, yet my good friend Dr Brubaker grows it like a weed. From Burma, it has weirdly shaped bright orange flowers on slender pseudo-bulbs. I know of no better way than to mount it on cork bark, water it well throughout Summer, then give it a drier rest in Winter. It is in beautiful flower as I write, I hope this time next year it will be better.

In 1956 we collected *Laelia albida* at about 6,000' in the state of Oaxaca, Mexico. I still have plants which flower every year. At about 7,000' on the same mountain *L.albida* gave way to *Laelia furfuracea* which is not as easy to handle, but should not be difficult. Both are lovely, *L.albida* with white to faintly flushed flowers, *L.furfuracea* with broader petals is a beautiful shade of satiny pink, four to five flowers to a stem, both are delightfully fragrant, we grow them in the cool house, hanging high on apple logs or cork bark. It is hardly fair to include them in this list. I should not have killed *L.furfuracea*. I would include one of the most beautiful *masdevallias*.

Masdevallia rosea. There are two forms, the best and largest we collected at about 10,000' near Loja in southern Equador. Accessable areas had been collected out when we were there in 1973 but by pushing farther and higher from the road we found a few in flower. Growing on rocks, in wet moss, a heavy scotch mist with good wind enveloped us at all times. The scapes about 13cm high had single tubular flowers rosy-carmine in colour, delicately fragrant.

These high elevation conditions, moist, and cool with good air

movement are hard to duplicate 17 miles from New York City where temperatures in July and August may reach 90°f 35°c or over for several days.

Near the interesting town of Banos Ecuador, at lower elevation on the side of a volcano the other form of *M.rosea* can be found. This one we have managed to keep, it is a little lighter in colour with slightly smaller flowers but no fragrance. It is a beautiful plant and we are thankful to have a form that we can grow. There should be no problems in the cooler areas of New Zealand where temperatures are not extreme.

I should add *Colax jugosus* to this list because I love it so, yet have killed several. They usually rot when water gets into the new growths, now we water with a solution of Benlate (Benomyl) 1 tablespoon to 1 gallon. I am sure it is available here. All our *Zygopetalums* are watered periodically with this systemic fungicide, it takes care of leaf-spot.

The reader will notice that so far all the plants discussed in this article are small, or miniature species.

The reason I have killed some of them may be that they are small, and therefore cannot receive individual attention in a large collection, sometimes we only have one or two plants to experiment with. I have killed large plants too both species and hybrids.

About 22 years ago I received a CCM/AOS for a beautiful specimen of *Diacrium* now correctly *Caulartron bicornutum* the next year it was dead. Potting mix had decomposed, roots rotted, and it was not noticed until it was too late.

My first FCC/AOS was won by a beautiful *Miltonia Hanover*. I was

offered \$400.00 US for the plant, which I refused. The next year it was dead, no explanation. I had kept Miltonias for years without problems, but had to loose this one.

I am reminded about it by my good wife Peggy.

At Greentree, four greenhouses are devoted to orchids, in the large palm house we grow the Vandas, many Dendrobiums, some large specimens of Oncidium ampliatum and miscellaneous other orchids. Seven other houses are used for growing a wide variety of plants for cut flowers, pot plants, and seedling bedding plants, and vegetables.

Outside gardens, a city house and garden plants for a summer home, plus decorating, take much time to oversee a few neglected plants are unavoidable.

Some of my orchid growing amateur friends can often do a better job with less plants and much loving individual care with constant handling, trouble can be spotted and quickly rectified.

In the main we have much fun with our orchids, and have made many friends throughout the world. This is most gratifying.

OBITUARIES

Miss Kathleen Alison M.B.E. Mr William James (Bill) Potter J.P.

It is with deep regret that we report the passing, within a mid-June week, of two of the best known orchidists in the country.

Miss Alison, in particular, was familiar to enthusiasts both here and overseas as a most discerning Judge of orchids and was responsible for the introduction of many fine Cymbidium and miniature Cymbidium clones into the country.

The New Zealand Orchid Society was formed in mid-1948 and Kathleen joined in December 1949. She maintained her membership and interest right up until her untimely passing on 11 June 1980. She was elected Treasurer in 1958 and President in 1967 and she had accepted the post of Assistant Registrar of the N.Z.O.S. Judging Panel just before her death. She was also the Society's Auditor for the last

two years.

Her M.B.E. was awarded in 1974 for her outstanding service and dedication as an Administrator of the Auckland University.

At the time of her retirement in 1974 she had the position of Bursar (and, at times, Acting Registrar) of the University and had served on the staff for 40 years. She held an Accounting Degree in her own right and was awarded an Honorary M.A. Degree in 1979 (5 years after her retirement). In the later years of her life she had taken a prominent part in the formation of the Orchid Council of New Zealand Judging Panel and both her quiet nature and her ever-readiness to impart her fund of knowledge to the many beginners, as well as more experienced growers, will long be remembered by her many friends and associates.



A week after Kathleen's untimely passing we were again saddened by the sudden death on 18 June of yet another New Zealand Orchid stalwart, Mr W.J. Potter — "Bill" to everyone who knew him. He joined the N.Z.O.S. five months after its inception and was an active member for 31 years.

Among his many creditable achievements and honours, probably the high-light was the Presentation of the N.Z.O.S. Gold Medal of Achievement on 18 May 1977, the Society's highest honour.

Bill was the instigator of orchid Judging in New Zealand and was responsible for the introduction of Judging Standards and Rules for both Shows and Awards almost twenty years ago. He served for seven and a half years as President over a period of four terms and was on the N.Z.O.S. Executive Committee continuously for 21 years and was responsible about seven years ago for the setting-up of beginners classes. As well as the Gold Medal, he was a Life Member and a Life Judge.

Few, if any, could match the service that Bill gave to his Society.

It must be remembered that for all of that period of Service he lived about 30 miles away from the various meeting places and seldom missed a meeting. While still continuing as a Judge and member of the Show Committee he anticipated the tremendous upsurge of interest in orchids and became the Founder and first President of

the South Auckland Orchid Society, in Papakura near to his home, and was later made its first Life Member.

In between all this he also took an interest and was an active member and exhibitor in the Waikato Orchid Society.

Ably supporting him through all of these years was his wife Effie who also took an interest in orchids but more on the Floral Art side.

To Effie and their daughter Jeanette and her husband and family as well as to the brother, sister and relatives of Kathleen Alison we extend on behalf of all the Orchid fraternity throughout New Zealand, our deepest sympathy and share with them in the sadness which surrounds the passing of two people who achieved so much in the pursuit and enjoyment of their hobby.

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Non-green Orchids of New Zealand

by Ella O. Campbell, Palmerston North

One of the fascinations of the study of orchids derives from the many strange forms and modes of behaviour that one encounters. Noteworthy are those species which have no visible sign of chlorophyll and so cannot manufacture food for themselves. There are five such species which are native to New Zealand.

I clearly remember my first encounter with *Gastrodia cunninghamii* while walking in January in the southern beech forest at the head of Lake Wanaka. I was watching my footsteps carefully on the uneven ground amongst the litter of branches and twigs left after felling of some of the larger trees when suddenly I found that some of the stems, though scarcely distinguishable from those surrounding them, were mottled brown in colour, about 60 cm tall, and carried 15—38 flowers which in face view were coloured white and silvery-grey.

Gastrodia cunninghamii is found throughout New Zealand and also in the Chatham Islands. Large specimens are up to 100 cm tall and the colour of the stems may be greyish instead of brown. It is associated with a variety of trees and shrubs. Once it was abundant in Fiordland and the Marlborough Sounds, but wherever wild pigs have access and root up the underground rhizomes, few, if any, plants remain. It has been called a saprophyte but in reality is a parasite on the fungus *Armillaria* which in turn is partly a parasite on the roots of trees and partly a saprophyte on litter. A suitable term to describe this habit of the orchid is epiparasite. The flowers sometimes have a distinct odour. Hover-flies have been seen to visit them for pollen but self-

pollination takes place readily and frequently.

Gastrodia minor is much more difficult to find. It has a slender umberbrown flowering stem, at most only 24 cm tall with 3—9 brownish flowers which rarely open and are generally self-pollinated.

One summer I joined other members of the Dunedin Naturalists' Field Club in a fruitless search through the area of manuka scrub in Opoho Creek, Dunedin, where Petrie first found it. Later I found it in mid-December growing very plentifully in a narrow belt of manuka scrub at the eastern end of Lake Manapouri. It has also been collected in the Central North Island, in Wellington and in Southland and apparently is always associated with a fungus that grows on the roots of manuka.

I went back to Manapouri in May, hoping that there might be fruiting bodies by which the fungus could be identified. But, amongst the tremendous wealth of fruiting bodies of all shapes, sizes and colours no one type stood out conspicuously. How the orchid recognises the appropriate fungus amongst all this array is a mystery.

Gastrodia sesamoides is recognisable in December or January by its slender brown flowering stem, smooth and shiny, some 45 cm or more tall, and with

10—15 yellowish or whitish flowers. The long column in the flower is distinctive.

This orchid was named by Robert Brown in 1810 from plants that he collected in the vicinity of Sydney, Australia. It has since been collected in several parts of Australia. In 1959 Dr. E.I. McLennan of the University of Melbourne made a study of the structure of the rhizome and of the fungus associated with it.

Rather surprisingly this orchid is also established in two small localities in the National Botanic Gardens at Kirstenbosch, South Africa, where it flourishes in plantations of English oak, *Quercus robur*, but has not spread beyond these areas. It is thought to have been introduced with Australian eucalypts (E.A. Schelpe pers. comm.).

In New Zealand it is local in occurrence and possibly here, too, it came originally from Australia. It is well-established at Silverdale, Auckland in a 1600 m² stand of *Acacia melanocylon* which derived from young plants introduced from Australia 100 years ago. Perhaps the *Gastrodia* may have arrived with them. As well it has been found in other parts of the Auckland province and at Queen Charlotte Sound white, although it was at one time plentiful near Takaka in Nelson, it has apparently disappeared and may not still occur there. I have found one plant in the Pohangina Valley and many colonies in the coastal region of the Manawatu, either amongst the rush-like *Leptocarpus similis* in slacks among the dunes or amongst *Pinus radiata* and *Cupressus macrocarpa* on old dunes at Foxton and in the Waitare and Santoft Forests.

It seems that *G. sesamoides* can associate with more than one kind of fungus, for that found by Dr. McLennan in Melbourne is different from the *Fomes* at Silverdale. As in the other *Gastrodia* species the fungus is also associated with the roots of woody plants or, as here at times, with the very fibrous roots of *Leptocarpus*.

Yuania australis is obvious in December when clumps of pinkish-white flowering stems up to 12 cm tall, appear above ground. These remain until February but gradually become less conspicuous as they turn brownish. The flowers at first are pinkish in colour; they scarcely open at all and customarily are self-pollinated.

Yuania has always been found under taraire, a forest tree of the laurel family which is endemic to northern New Zealand as far south as latitude 38°. A puff-ball fungus, which is wide-spread in the organic layer of the soil, establishes itself in the outer zone of the taraire roots and connects them to the extensive branching system of fleshy rhizomes of the orchid.

Corybas cryptanthus is recognisable in late spring by slender fruiting stalks which elongate after flowering to a height of 15 cm and are marked by red flecks. Flowers may be found from July to August, or occasionally somewhat later, but they are rarely seen as usually only the delicate, thread-like tips of the lateral petals and sepals project above the carpet of mosses and leaves on the forest floor. It has been recorded from many parts of New Zealand growing under *Nothofagus* or *Leptospermum*. Localities listed in the Flora of New Zealand Vol II are Auckland, Taupo, Wellington, Wanganui, Reefton and Manapouri.

Underground there is a fleshy branching rhizome, whitish in colour and sometimes flecked with magenta. There is practically no trace of the root tubers which form the underground system of other *Corybas* species. On the rhizome are low cushions bearing hairs. It is through these that the fungus gains entry to the orchid rhizomes. The fungus in the colony at Pinehaven, where Mr A.P. Druce first showed me plants of this orchid, was also growing among the litter of fallen beech leaves and twigs and on the fine roots of the beech trees.

There seems to be no doubt that the non-green orchids have been derived from ones with green leaves. Interesting in this regard is a non-green form of *Calochilus carnpestris* which has been found in Australia, as noted in "The Orchadian" 5 : 83, 186; 6 : 20 (1976 and 1978). So far this form has not been observed in New Zealand, but it is worth looking for.

There is also no doubt that the orchid must have a reliable source of food. This is very evident in the amazing *Galeola kuhlii* of Malaysia and neighbouring countries for its reddish-brown stem, climbing amongst other vegetation, may be 15 m or more long with a succession of yellow flowers — a truly remarkable sight.

All of the 5 New Zealand species are parasitic on fungi of a special type which can establish themselves on tree-roots or on other fibrous roots which have some degree of permanency. From such a base they can exploit the neighbourhood and can obtain food from a wide variety of complex substrates such as wood and bark on the forest floor and may at times even be parasites on living roots.

The system is a very delicately balanced one. Each of the New Zealand orchids has a limited range of one or a few fungi with which it associates and these fungi are different for each orchid.

CYMBIDIUM COMPANIONS

Ros Bickerstaff, 12 Enfield Rd, Napier.

EPIPHRONITIS

This is a manmade genus. It was made by the Veitch Nurseries using the two species, *Sophronitis coccinea* and *Epidendrum radicans*. The result is a really beautiful miniature reedstem *Epidendrum* having the colour of *S.coccinea* (Pron. — coc-sin-ee-a). It is relatively easy to grow, needing shelter, moderate moisture and plenty of fresh moving air, to keep the foliage dry as it is susceptible to rot. *Epiphronitis Veitchii* seems to be the only hybrid available. Try to get a plant, you will love it.

GOMESA, R.Brown.

This genus was named to honour the writer of a book on the medicinal plants of Brazil, Dr. Bernardino Antonio Gomes, a Portuguese naval physician and botanist. These plants are related to the *Odontoglossums* and are found in Brazil. They are mostly epiphytic and enjoy a well-lighted position, which is sheltered from winds. Give good drainage. I use fibre, bark and punice and small pots. The flowers are greenish-yellow in dense masses on arching spikes, slightly fragrant. Mine flower in February-March and are long-lasting. I grow *G.glaziovii* (syn.scandens), and *G.recurva*.

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Fletcher Brownbuilt became involved with the manufacture of Durolite, a glass reinforced polyester sheeting nearly 20 years ago. However it was two later developments which led to our interest in horticulture. The first was the introduction of the Du Pont TEDLAR film as an integral part of the base sheet. The second was our access to research from overseas which clearly demonstrated that higher yields could be obtained from crops grown under glass reinforced sheeting. (grp). Today greenhouses manufactured by Fletcher Brownbuilt are part of a substantial building systems business and already in this country there is in excess of half a million square of Fletcher Brownbuilt Greenhouses, sheathed with Durolite f, in use. In addition a considerable quantity of the material has been used for re-cladding a wide variety of existing structures.

WHAT IS DUROLITE F: Durolite f is not just another PVC plastic sheeting. PVC materials are thermoplastic, subject to quite rapid deterioration of visible light transmission values and whose long term performance has yet to be achieved or proven. Durolite f on the other hand is a thermosetting material. It is not effected by even extreme changes in temperature, has a low coefficient of expansion and a very high resistance to impact damage. The incorporation of Tedlar, a polyvinyl fluoride film, on the weather surface, screens, and reduces the transmission of UV light overcoming the problem of surface erosion experienced by the early manufactures of grp sheeting.

The diffused light transmission properties of Durolite f are now well proven, and while minor discolouration may occur after a period of 8 to 9 years, the actual visible light transmission qualities are maintained. This unique feature is due to the fact, that, when the sheet is new some of the visible light is actually reflected, but as the sheet weathers the reflectivity of the sheet is reduced and a proportional increase in the amount of admitted light takes place. From experience to date we would expect Durolite f to have a commercial in service life of at least 15 to 20 years. There are, however, no guarantees or implied warranties issued. Durolite f sheeting can be readily fixed to any structural frame, and, as other speakers will confirm, will give satisfactory performance. Durolite f is a long term performance material. It is not just another plastic sheet.

There are three major reasons why Fletcher Brownbuilt Greenhouses are starting to dominate the market with documented results:

Over all improvement in crop quality; a 10 percent increase in crop yield; a 25 percent reduction in basic fuel costs.

Initial Cost: The initial cost is often said to be higher than for the traditional timber framed glasshouse. However surveys clearly indicate that when all costs are taken into account the Fletcher Greenhouse is competitive especially when compared with other brands of steel or aluminium structures, and erected costs, anywhere in New Zealand, of around \$6.50 per square foot for houses averaging 3000 square feet and \$5.00 per square foot for houses of 15,000 to 20,000 square feet prove this. These prices include the house complete with ridge and eaves vents and ready for operation.

Maintenance: In considering initial cost one must look to annual maintenance costs. Here the Fletcher Brownbuilt Greenhouse offers definite advantages as time and user experience has proven.

Crop Protection: A grower must decide for himself the relative importance in protecting his crop. A flimsy lightweight structure may be adequate for areas experiencing low wind speeds and a warm climate. But protection is necessary for areas experiencing high wind speeds, adverse weather conditions, snow and other vagaries of climate. The Fletcher Greenhouse is not only designed to ensure improved growing conditions, but also to meet all relevant local and national building codes. A design certificate is issued with every house certifying compliance with the codes, based on a wind loading of 40 metres per second and snow load of 600 mm. In addition the structural frames are strong enough to carry suspended crop loads.

Heating Costs: You will hear from Dr. White of the effects that Durolite f can have on your direct and indirect heating costs. When compared with glass, Durolite f will reduce heating costs upward of 20 percent, and with the application of a film to the underside of the purlins a further 30 to 35 percent reduction is possible.

Crop Yields: Because of high light levels, especially during inclement weather, better temperature control, and the light diffusing properties of the Durolite f sheeting, crop yields exceeding those grown under glass have been recorded. The results have of course been variable, but generally speaking the claim of increased crop yields has been substantiated by grower experience.

For further information — Fletcher Brownbuilt Stand 25 Orchid Conference

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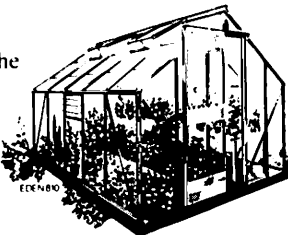


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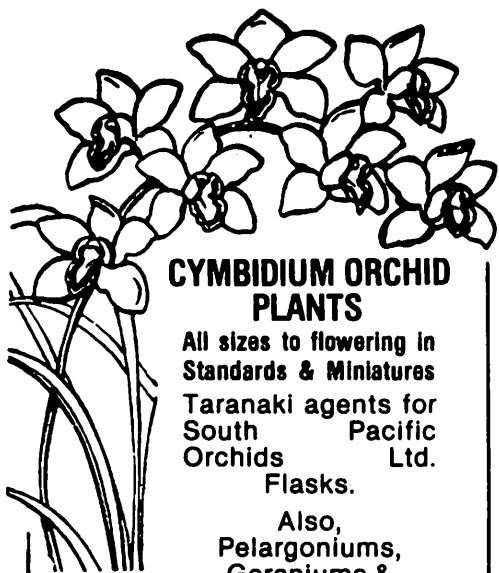
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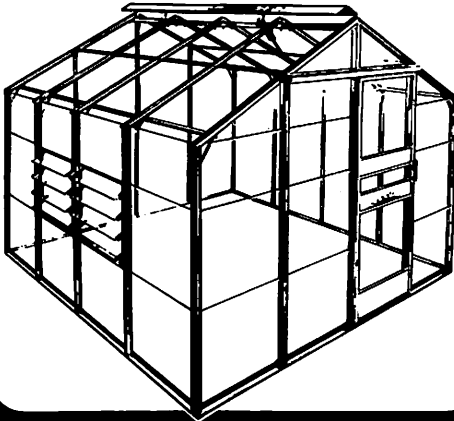
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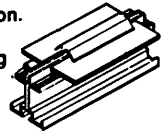
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P20 DOWN'S DELIGHT 'MASTERPIECE' (4N) x SLEEPING CASTLE 'CHAMPAGNE' (4N).

D. D. 'Masterpiece' is one of our new tetraploids. It flowers in May and is much sought after since appearing on the cover of our 1979 catalogue. S.C. 'Champagne' is an oatmeal colour, long spiking and a striking orchid. Expect ultra-early, shapely greens and yellows. Show & cut flower. 100% 4N.

P23 VALLEY SONNETT 'DONCASTER' (4N) x VALLEY PARADISE 'SHANGRILA' (4N).

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P14 ROTHERSEY 'BLACK LABEL' (3N). By arrangement with Burkes' Orchids of N.Z. we are able to offer this clone that carries up to 18 near 5" brown flowers on a strong, trained straight stem.

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