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MARCH/APRIL 1980

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ORCHIDS OF NEW ZEALAND

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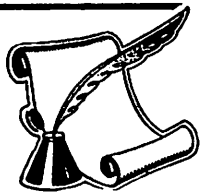
Cover Photo: Maclellanara Pagan Lovesong 'Murray Anderson' AM/AOS. The new inter-generic name Maclellanara (early 1978) is named in honour of the late Mr Rod McLellan = Brassia x Odontoglossum x Oncidium. Mclna Pagan Lovesong is Odcdm Tiger Butter x Brs verrucosa. The colour block of this lovely flower has been generously donated by Mr Andrew Easton of Featherhill Exotic Plants, California, U.S.A. This plant has pride of place in Mr Easton's private collection and the varietal name is of a New Zealander.

LETTERS TO THE EDITOR



Dear Sir,

I was most impressed with the high quality photograph reproduced with the excellent article entitled 'Orchid Import Restrictions' in the November/December issue. Usually the only photographs are restricted to Pukekura Corner, and these certainly enhance the botanical descriptions.

Is there any technical reason why we cannot have one or two photographs with every article in the magazine?

Your faithfully,
Keith Goodwin.

There is no technical reason why black and white photos cannot be used with every article — all we require are good quality photos.

ED.

TUTUKIWI ORCHID and FERN HOUSE

Thanks to the generosity of our friends and visitors we now have funds available to purchase flowering size orchids, other than Cymbidiums.

Please forward details to Tutukiwi Orchid and Fern House, P.O. Box 30-553 Lower Hutt.

Tutukiwi Orchid and Fern House is the property of the Lower Hutt City Corporation and is situated adjacent to the Town Hall. Tutukiwi is open for free public viewing seven days a week.

Dear Sir,

The November/December issue of Orchids in New Zealand (page 47) made the rash statement that rust diseases do not occur in New Zealand Orchids.

I would like to correct this, as north of Auckland many of our native terrestrial orchids which we share with Australia, Thelymitra, Microtis etc. are host to a rust disease, probably crown rust (puccinia coronata) fortunately the repeated use of the fungicide zineb will give adequate control.

Very truly yours,
Allan Jones.

In the article on "Orchid Import Restrictions" we were concentrating on intercepted exotic rust diseases and the statement that "none occur in New Zealand" was referring to these. We had quite overlooked the fact that rust diseases do occur on New Zealand native orchids and we are grateful to Mr Jones for bringing this to our attention.

The rusts of native orchids known to the Ministry of Agriculture and Fisheries are: ***Uromyces orchidearum*** *on* ***Caladenia carnea;*** *this rust also occurs in Australia.* ***U. microtidis*** *on* ***Microtis unifolia;*** *also occurs in Australia.* ***U. thelymitrae*** *on* ***Thelymitra caesia, T. longifolia;*** *this rust also occurs in Australia and Indonesia.*

As far as we know these rusts are highly specialised and do not infect exotic orchid species.

Crown rust ***(Puccinia coronata)*** *is an introduced species that has a wide host range amongst the cereals and grasses with alternate hosts overseas in the families Rhamnaceae and Elaeagnaceae; as far as we know there are no alternate hosts of crown rust in New Zealand.*

A.F. Rainbow
A.J. McCully
Ministry of Agriculture and Fisheries.

A REVIEW OF THE BREEDING FOR RED CATTLEYAS

By U. Sharland and M.J. O'Connor
South Africa.

Colour in Cattleyas is due to pigments contained in the plants' cells. The presence or absence of these pigments is determined by the genetic make-up of the species and of the plant itself. Colours may be segregated into three classes — (1) White, (2) Yellow, and (3) Red and Blue. The pigments responsible for such colours are either Anthocyanins, Anthoxanthines, or Plastid pigments. The former two are sap-soluble compounds consisting of the true colouring matter chemically united to one or more molecules of a sugar. The latter are non-watersoluble pigments existing as granules in the cytoplasm of the cells of the flower parts. The plastids are yellow or orange substance belonging to the group of compounds known as caratinoids (the colouring matter of carrots and squashes). Plastids are rare or absent in Cattleyas.

The Anthocyanins are responsible for scarlet, red, and blue colouration. The Colour of the Anthocyanin may be altered by Structural or internal changes of the molecule, that is, in the way the colouring matter is united to the sugar. The degree of acidity or alkilinity also affects the colour. The more acid the cell sap, the redder the colour, and the more alkaline the sap is, the bluer the colour.

The Anthoxanthines which are related to the Anthocyanins are united to a different sugar, and their colour ranges from ivory to deep yellow. When Anthocyanins are absent, this may be directly responsible for colour. When both Anthocyanins and Anthoxanthines are present, they may, if in the same cell, blend in the same manner in which paints are mixed. When they are in different cell layers, a background effect is produced. This, however, is practically the same as a blend to the naked eye. When Anthocyanins and Anthoxanthines do combine, the resultant colour is bluer. As both are formed from common precursors, (building blocks), a balance exists, and if more of one is formed, less of the other is consequently formed.

Colour of orchids has been an important point in the breeding programmes of hybridists. Red in species Cattleyas is unknown, and commercially red Cattleyas are not much in demand as cut flowers. However, to the orchid enthusiast, a good red cattleya is still a goal. to be aimed for.

Half a century ago, C. Hurst predicted that large red Cattleyas would be produced by crossing Sophronitis coccinea with the best large white Cattleyas. However, this line of breeding produces mainly lavenders. Breeding with Sophronitis did, however, produce some reddish-purple flowers, e.g. Sic. Anzac registered in 1921. The large red Cattleya was still not to be had. But breeding with

_sophronitis continued, producing small red Slcs. e.f. Slc. Falcon. Slc. Falcon (Lc. Aureole x Sl. coccinea) was made over forty years ago, and as a parent was very disappointing, because of the extreme delicacy of its progeny, but with modern advances in breeding, it is coming to the forefront as a good parent for reds, when crossed with male or pollen parents, such as Slc. Anzac "Orchid-hurst", Lc. Lee Langford "Copper Queen," Pot. Gordon Siu "Red Radiance," Norman's Bay "Lows," etc.

An unexpected breakthrough came when Mr Loe Ozella crossed Lc. Lee Langford "Copper Queen" with C. Nigrella. Although this cross contained no Sophronitis blood, the resultant Lc. Marie Ozella, which bloomed in 1957, was a large Laeliocattleya, with a high percentage of fire-e ngine reds, reddish-plum, and some extremely dark reds. The reason for the red without Sophronitis blood is thought to be due to the bleeding of Anthocyanins and Anthoxanthines as discussed briefly earlier.

Another line in breeding for reds could be by crossing dark reddish-lavenders such as Ardentissima. Nigrella, Firebird, Fabia, Tethys, etc., with yellow Laeliocattleyas such as Lee Langford "Copper Queen," Edgard van Belle, Canberra, Mysedo, Grande, etc., and the best results of these breedings crossed again with red Sophros. Lee Langford "Copper Queen" crossed with some semi-albas has made some excellent yellows and reds, such as "Lena Baldwin," "Rouge," "Coral Sea," and as a parent to reds should be watched. Lc. Langford "Copper Queen," with its Dowiana background when crossed with C. Nigrella, produced Lc. Marie Ozella, and when crossed with Lc. Edgard van Belle produced the oft-awarded Lc. Belle of Celle, which is a magnificent deep ruby-red.

From these breedings it becomes apparent that when we use a dark reddish-purple such as Slc. Anzac "Orchidhurst," and cross this with other dark lavenders, the resultant progeny is dark like the parents. When crossed with a clear yellow, the resultant progeny are more bronze and yellows than reds. When crossed with orange the resultant progeny are more reds than bronzes and yellows. In this respect C. aurantiaca, a species little used for breeding previously, has a bright future, and already has some awarded red progeny, e.g. Slc. Jewel Box. Another point to emerge from the struggle to produce fine large Cattleyas, is that tomato red is recessive in character.

Before going further with these trends in breeding for reds, a breakdown of the breeding of some well known reds may help in our understanding of what is required to make a red Cattleya. Firstly let us examine Slc. Anzac which though not red, provides a building block for many future Slc. hybrids. Slc. Anzac is Slc. Marathon crossed onto Lc. Dominiana. If these two are broken down into the basic species, we would find L. purpurata, L. cinnabarina, S. coccinea, C. Mossiae, and C. Dowiana appearing twice. Slc. Falcon is Lc. Aureole x S. coccinea, and Lc. Aureole broken down to species level is L. Tenebrosa, C. bicolor, and two parts C. Dowiana. These are just some of the red Sophronitis crosses, and others include Slc. Paprika, Slc. Brandywine and Slc. Vallezac. Other

reds containing no Sophronitis influence, and when broken down to species level are — Lc. Marie Ozella, which is Lc. Lee Langford "Copper Queen" x C. Nigrella, and these are made up of L. tenebrosa, C. bicolor, C. Mossiae, C. labiata, and two parts C. Dowiana. L.C. Lena Baldwin is L.C. Lee Langford x Lc. Memoria Peter Sander (a white with coloured lip). Multigeneric crosses which are reds are Potinara Gordon Sui which is Slc. Radians x Bc. Hartland. Broken down to species, this gives S. coccinea, L. cinnabarina, C. Mossiae, C. Gigas, C. labiata, C. Perciviliana, and C. Warneri. Another red Potinara is Carousel. Crosses using C. aurantiaca include Slc. Jewel Box, which is Slc. Anzac x C. aurantiaca. Lc. Eva, a small red, is L. cinnabarina x C. aurantiaca, Lc. Red Gold is Lc. Charlesworthii x C. aurantiaca. A pure Cattleya cross giving some fine reds is C. Tango x C. Lodigessii. this list is only a few of the many red Cattleyas, and by breaking them down to species, one notices that the species that predominate are C. Dowiana, S. coccinea, L. tenebrosa, L. cinnabarina, and C. aurantiaca. Let us now examine some of the species, and see what characteristics are passed on to their progeny. C. Dowiana, a yellow labiata-group Cattleya tends to intensify lavender. The progeny have good shape and size. The lip pattern and scent of Dowiana is dominant. Rhyncholaelia Digbyana also has a dominant lip pattern. Cattleya aurantiaca, a small many flowered, cupped orange bi-foliate is dominant for shape, but the flowers are larger and clear coloured when crossed. Cattleya granulosa is also dominant for shape, as well as for number of flowers, isthmus lip, and bronze to red coloured flowers. The orange and red of Laelias is predominant over the lavenders of Cattleyas, that is the reverse of C. Dowiana.

Laelia cinnabarina is dominant for its orange colour and is near dominant for shape and growth habit. Laelia harpophylla is also dominant for orange colours, and is near dominant for shape. Sophronitis coccinea is dominant for colour and shape, with few small flowers on short stems. There is also a high sterility with Sophronitis.

About a decade ago, Laelia Milleri was discovered, and we are all familiar with its deep red multi-flowered starry appearance. It has already produced some very fine awarded smallish red hybrids, such as Lc. Rojo (Milleri x Aurantiaca), Slc. Jinn (Milleri x coccinea), and L. Zip (Milleri x tenebrosa), to name a few. Shape-wise and size-wise it still has to prove itself, but had it only been discovered about forty years ago, we wonder what its inclusion in a red breeding programme would have produced by now.

Now that some fine red Cattleyas have been bred, what lies ahead in the breeding of reds? In a young society like ours, where very little hybridization is done, we can only wait expectantly and admire the best of the new crosses as they emerge. We can, however, speculate and wait to see if such crosses materialise and see whether our predictions do in fact produce fine red Cattleyas.

PUKEKURA CORNER

By George Fuller, N.D.H. [N.Z.],
Curator Pukekura Park, New Plymouth.

Corybas oblongus (Hook.f.) Reichb.f.

In the glamour associated with orchids we tend to respect the flamboyant and overlook the tiny gems. For this reason our New Zealand native orchids are sadly neglected — or have been until recently.

I cheat a little here, for the subject of my photograph was not taken at Pukekura Park but in another park a few kilometres away. Needless to say however, attempts have been made since, to establish a colony here.

The genus Corybas has a wide distribution encompassing an area from the Himalayas eastward to the Philippines and southward to Australia and New Zealand. I recently read to my astonishment that plants of this seemingly fragile genus had been found on no less a rugged spot than the inhospitable MacQuarie Island 1770km. south of Australia! Surely a most unlikely location for any orchid.

Corybas are characterised by a single, usually heart-shaped fleshy leaf which tends to lay close to the growing surface or only a few centimetres above it. The flower, (usually one) arises close to or actually on the leaf and is dramatically modified. Most New Zealand species have the petals and lateral sepals elongated into filaments, giving rise to the popular name of 'spider orchids'. They most certainly look like something from the creepy crawley world.

They survive the unfavourable growing season by shedding their

leaves. Unlike most orchids we grow, they have underground spherical tubers about 3—5mm in diameter. These send out shoots and leaves when favourable growing conditions return. Some species have very efficient methods of vegetative increase but this should not be taken to mean that they are easy to cultivate. Hawkes has a good illustration on page 130 by Rupp showing growth habit of C. pruinosus but my facetious imagination sees more humour than plant physiology. Surely they are convicted hob-goblins prancing about — or are they really prawns?

I was greatly thrilled to find my first C. oblongus and the closer I looked the more enchanted I became. The leaves are about 2cm across and quite granular in texture, though not as crystalline as some species. 'Crystalline' is the only fitting description for the delicate bloom however, for on magnified inspection it is so translucent that it looks as if it would melt. There is a sub-tending leaf-like bract just below the bloom and the green dorsal sepal cowls over rather like a hood. As previously mentioned, petals and lateral sepals are drawn out into long filaments spanning approximately 5-6cm. but it was the labellum which most attracted me. It forms a funnel-like structure very heavily suffused with maroon-purple. The periphery is lime green, markedly serrated and just to give a touch of perfection, on each point of the serrations this specimen has a dash of maroon-purple.

I made several observations of the colony I found and they indicate that there is a tremendous amount to be learnt about the native orchids that we tramp on when we go for a nature ramble. Unlike some species, every mature-sized leaf (i.e. over about 1cm.) bore a flower but the density of leaves per unit area was low. It may have been coincidence but I only found plants on steep surfaces though horizontal shelves existed. Although covered with mosses etc. the banks would be fairly dry in, the dormant (late summer to autumn) period.

It is difficult to give advice on pot-cultivation of native terrestrials and especially Corybas species, mainly because I have little experience. One method is to take a substantial piece of the growing site and place it in a container but this can have problems in the long-term. I'm sure that the difficulties will be overcome by making mixes of materials we already use or have access to. Peat, leafmould, fine bark chips, sphagnum moss etc. and perhaps in some cases local soils should provide the answer.

I conclude with a few observations with which we should temper our enthusiasm for collecting. It is unlawful to collect in a National Park, reserve or even from private land without requisite authority. It is vandalism to collect even with authority if you have no chance of ensuring survival of the plants or if you are not using them for scientific purposes. It is conservationism if you endeavour to save plants threatened by land development, erosion etc. Acknowledge that these are plants with quite complex lifecycles and wherever possible, they are best left where nature has ordained they should be so that others may enjoy the thrill of finding and hopefully studying them.

Whither the New Zealand Cymbidium Export Industry

by Andy Easton, P.O. Box 262, Goleta, CA 93017, USA

As a Cymbidium hybridizer with particular interest in the needs and futures of New Zealand orchid exporters, I would like to make a few observations.

It is not necessary for me to stress that New Zealand has a unique climate. But it may be appropriate to remind growers that the New Zealand Cymbidium cultural methods are also unique. I know of no other Cymbidium producing area which grows its mature plants as cool. In many ranges that I have visited, plants are let go as low as 0 deg. C. on a regular basis in winter. While this is not detrimental to some plants and some flowers, it does pose problems. Let me illustrate.

Any variety with a strong erythrostylum background like Bethlehem, Good News, even Fred Stewart or Winter Fair hybrids, will never deliver its full potential unless night temperatures are maintained between 10—14 deg C. throughout the cooler months. Below this temperature range flower size is reduced, roots are lost and blooming time retarded. Other clones like Cariga 'Canary,' varieties with strong red lips are often Remus FCC hybrids, will develop "lip bleeding" at low night temperatures. This colour diffusion is accompanied by evolution of endogenous ethylene and flower life is drastically shortened.

There is another more insidious effect of low temperatures in the mid-season and late blooming clones. It is known that Cymbidium root tips tend to become brown and inactive when night temperatures are consistently below 7 deg C., especially if these night conditions are accompanied by cloudy, cool days. Consequently many later blooming varieties when grown in New Zealand fall short on two counts, Because the flower spikes mature when the roots are inactive, they must develop using energy stored in the pseudobulbs and flower size is reduced. This is a common complaint one hears about New Zealand flowers from overseas importers like Gary Gallup of Gallup and Stribling. They are able to make this comparison because with the distribution of mericlones, overseas growers are also growing the same variety and are familiar with its characteristics under their conditions.

Of even greater significance is the little recognised problem of aborted buds at the tips of flower spikes. When spikes initiate they generally do so in the late summer and early autumn. At this season, plants are in active growth and are, hopefully strong and vigorous. A set number of buds form on each initiated spike, the greater (up to a genetically determined maximum) the more robust a plant is. Then when active growth is allowed to slow or even cease during the cold,

short days of winter, the same plant is not able to support the development of all the buds that it has previously initiated. Consequently it will abort some buds, those closest to the tip of each spike. These aborted buds are invariably visible on Cymbidium spikes throughout New Zealand in the late winter and spring months. I will leave each grower to estimate the economic impact of these insidious losses but let me assure you they are substantial.

Now, I am sure it is possible to develop a strain of Cymbidium that will better withstand the cooler conditions prevalent in New Zealand. It probably won't be done in one generation however and when one realises that a generation (to include meristem selection and propagation) may be as long as 15 years then such a goal is a distant, if eminently desirable one. But New Zealand exporters must pay much more attention to June and July export markets. Italy in particular is a major importer of Cymbidium flowers in June and Northern hemisphere growers, fighting Thrips, Aphids and late spring hot spells, just don't have sufficient flowers left after Mothers' Day to satisfy current demands. I am tired of hearing growers tell me there's no export market to the Northern hemisphere in July. Don't tell the Aussies — they've been shipping out every export quality flower they can produce in July for years!

I am not advocating expensive houses and massive heating systems either because although New Zealand has possibly the worlds' largest reserves of natural gas, I'm sure it's not going to be a cheap resource in the future. But growers should do much more to conserve daytime solar heat in production houses, select the warmest winter growing site possible and line with polythene film. All these inexpensive steps will do much to expedite blooming time and increase production per square metre, two key factors influencing profitability.

Some varieties currently grown in New Zealand are as productive and reliable there as they are in the locality where they were first selected and meristemmed. Such a variety is Jung Frau 'Dos Pueblos,' probably more widely grown in the US, Australia and New Zealand than any other Cymbidium. Incidentally, it has never become popular in Europe because a similar, though in all respects inferior, clone was marketed throughout Europe and even in New Zealand as Jung Frau 'Dos Pueblos' and proved unsatisfactory. Sometimes a clone such as Hawtescens FCC, largely out of favour in the rest of the world, will remain locally popular as it has in New Zealand. It is a clear, late blooming yellow, more productive under New Zealand conditions than elsewhere. Such are the idiosyncrasies of Cymbidiums.

One thing is certain and that is the orchids for future commercial meristemming in New Zealand will come from seedlings. It does not matter one whit whether the seedling was hybridized in California or Kati Kati, what is important is that it is highly productive bearing the finest export flowers under New Zealand conditions. Maybe even this is a too generalised statement. It is not inconceivable that a clone proving ideal under Waikanae conditions would be a disappointment in Whangarei. After all there is 5 deg.

of latitude difference between the two areas, equivalent to the distance between Sand Diego and San Francisco, two Cymbidium growing areas in the U.S. where quite different clones are favoured.

This year I have visited the major Cymbidium producing areas in the Southern hemisphere: South Africa, Brazil, Australia and New Zealand. Despite what you might have read or been told, all have their advantages and disadvantages when compared to New Zealand. With intelligent variety selection, aggressive marketing and a commitment to reliable, quality Cymbidium production, I believe New Zealand growers will enjoy a unique Southern hemisphere production niche in the years ahead. But lest growers become complacent let me remind you such a potential will be shattered by greed, lack of co-operation between growers and the inability to develop an integrated Cymbidium export production. The ultimate position of New Zealand Cymbidiums in the Northern hemisphere markets, rests squarely in your hands.

COUNCIL ESSAY AWARD

Readers are reminded that copy for this award must be in the hands of the Editor on or before 30th April 1980. 2000 to 3500 words on any orchid subject. Two cash prizes will be awarded, one of $100 and one of $50. The Editor, Orchids in New Zealand, 30B Waiwaka Terrace, New Plymouth, New Zealand.

OCNZ Awards 1978

Award No. 5/78. Maxillaria picta 'Belmont' — Mr J. Mason — Cultural Certificate. Sepals pale tawny yellow inside and whitish. spotted with purple outside. Petals similar with a red basal streak. 41 flowers in a 15cm pot.

Award No. 6/78, 7/78: Odontocidium Crowborough 'Moxham' — Mr F.R. Askin — HCC/Cultural Certificate. Dimensions: Natural spread 51mm, Dorsal Sepal Length 23mm, Width 14mm; Lateral Sepals Length 21mm, Width 12mm; Petals Length 26mm, Width 11mm; Lip Length 22mm, Width 20mm. Petals and Sepals gold-yellow. Heavily spotted with chestnut-brown. Lip ivory with gold throat. Crest chestnut. 4 spikes, 3 in bloom. 61 flowers, 30 buds.

Award No. 8/78: Cym. San Francisco 'The Beat' — Mr G.A. Grimson — HCC. Dimensions: Natural spread 104mm. Dorsal Sepal Length 74mm, Width 43mm; Lateral Sepals Length 70mm, Width 42mm; Petals Length 71mm, Width 35mm; Lip Length 31mm, Width 35mm. Polychrome. Petals and sepals deep cream, yellow base overlaid, flushed and veined with deep greenish-tinged rose. Labellum cream with maroon splashing at apex, flushed rose at edges. Column rose-maroon. 1 Spike, 10 flowers, 3 buds.

Award No. 9/78, 10/78: Den Bardo Rose — Mr G.W. Rabe — HCC/Cultural Cert. Dimensions: Natural Spread 27mm. Dorsal Sepal Length 16mm, Width 8mm, Lateral Sepals Length 15.2mm. Width 9mm; Petals Length 15mm, Width 5mm; Lip Length 11mm, Width 8mm. Petals, Sepals and lip soft rose pink with a glittering crystalline texture. A complete mass of bloom.

Award No. 11/78: Den. speciosum — Mr J. Roper — Cultural Certificate. Petals, Sepals and lip creamy white. 38 spikes, 60 blooms per spike.

Award No. 12/78: Cym. Jungfrau 'Dos Peublos' — Mr S.G. Woodbury — Cultural Certificate. Petals, Sepals and lip glistening white. 10 spikes, 120 blooms.

THE HOT HOUSE

Brian Cosnett
Wellington Orchid Society

One of the fundamentals in growing orchids is to simulate as closely as possible their natural environment. The warmer growing varieties which originate from the equatorial countries such as Asia with high average temperatures and high humidity the whole year round require special treatment in this part of the world. The most satisfactory way to control the environment is the hot house where light, heat and humidity can be controlled and brought into line with their natural environment.

One of the warmer genera requiring special treatment is Phalaenopsis. I find this one of the most rewarding orchids and, provided the right growing conditions can be achieved, flowering continues throughout the year. We know this genus of orchids does best when it is —

(a) Not exposed to direct sunlight.
(b) Kept at a high humidity and the air kept moving.
(c) Not subjected to temperatures below 60 °F (15 °C).

In this article I will endeavour to tell how in the Upper Hutt valley I have controlled these factors in a very small hot house which measures: length 3 metres, width 2 metres, height approx. 2 metres, with sides of 1.050 metres.

Light: The north facing end of the glasshouse is glazed, the south end is fibrolite, the roof and sides are clad in corrugated translucent plastic. This means there is a light gradient from the north to south end in the house with the light intensity lowest near the south wall.

Near the glass end a few Vanda, Dendrobium and Cattleya plants enjoy the strongest light intensity. Behind these I grow about 50 Phalaenopsis in about 1,000 foot candles of light on fine days. On the south wall are mounted a couple of propagation hot boxes for small plants. Over the hot boxes are suspended fluorescent light fittings about two feet above the box surface and as well as providing illumination at night they are used to supplement daylight over the winter months. The tubes used in the lights are ordinary cool white Type 33. These are manually switched and are on about two to three hours mid-winter.

Humidity: The aim is to keep this high and the humidstat in my house seldom reads lower than 60% — most times it reads 80% or more. The floor on both sides of the house is covered with plastic sheeting and on this is a layer or two to three inches of river shingle and stones. This is watered thoroughly once a week in winter and about three times a week in summer. In addition green moss and weed is encouraged to grow where it will and daily a fine mist is sprayed over the plants in the morning. There is always a plastic bucket of rain water near the fan heater which serves the dual function of —

(a) A supply of ambient temperature water for daily spraying.
(b) A source of evaporating water to humidity.

Air Circulation: Air circulation is a must in hot houses where the humidity is kept high, if fungus diseases are to be avoided. Gentle circulation with lower velocity fans is preferable to gale force winds produced by some types of fans. In my house a small fan runs 24 hours a day circulating air around the hot boxes. The automatic fan heater blows warm air at low velocity when it comes on, and a third small fan mounted high is switched on during the warmer weather to boost air movement. This system of fans in conjunction with louvre ventilators on the north and south walls effectively control the temperature rise in summer to about 32 °C (90 °F) maximum and ensures the necessary air changes to maintain a healthy environment.

Heat: If you haven't heard of the energy crisis then your pocket will have felt its effect. No matter what fuel you use to heat your glasshouse — coal, fuel oil, gas or electricity — all have increased in cost dramatically over the last two years. The winters too appear to be colder, or perhaps it's me getting older. I can only say I am thankful that my hot house is small and relatively economical as far as heating is concerned. The volume of air is small and there is no wasteful high level to heat above the plants. We know hot air rises and in many houses I can visualise the dollars that must be burnt up in warming that air high above the plants.

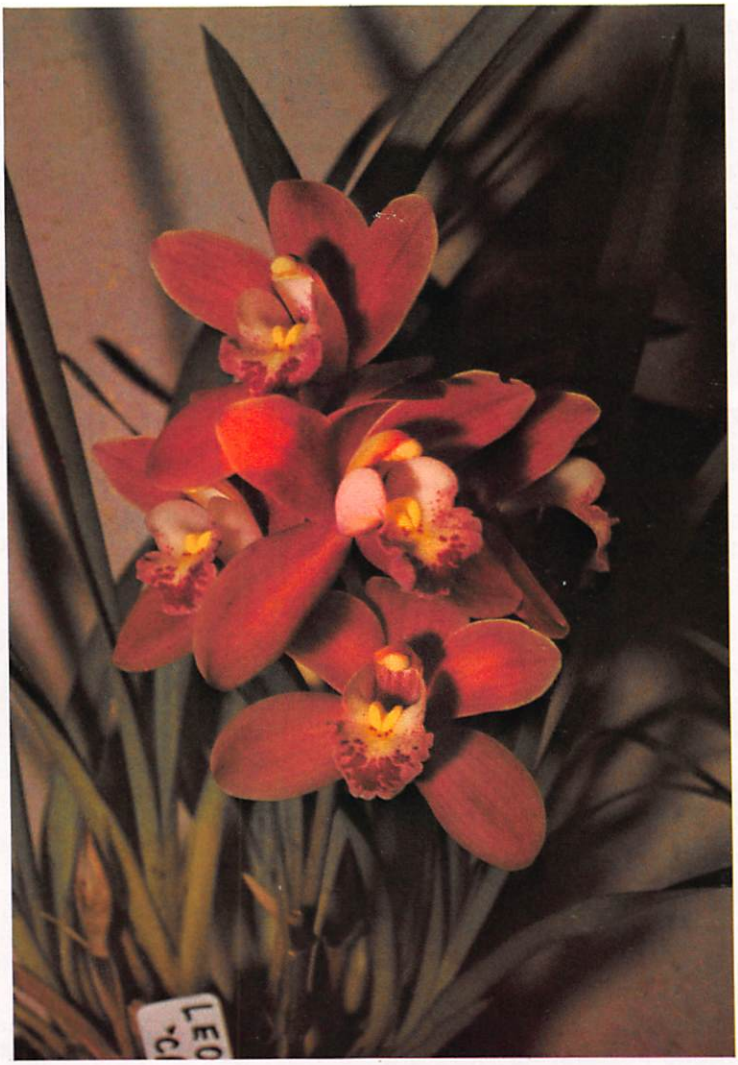
Alas, there is no such thing as cheap heating. The problem is worsened when trying to grow warmer varieties in areas such as the Upper Valley where frosts can be severe.

In my small house I use an electric fan heater thermostatically controlled as a means of heating. The heater element is 500 watts, i.e. half a kilowatt, and the fan blows warm air at a low velocity. On very cold nights the temperature does not drop below 15 °C (60 °F). To achieve this economy, insulation must be used. Glass, plastic, fibrolite and soil all have poor insulation properties. For inside insulation I have heavily painted Pinex which does not absorb moisture, covering the fibrolite and thick 1/16 inch clear plastic covering the glass and corrugated plastic. I used these materials because they were given to me — there are others which would do the job of insulation as well. For example, wood such as marine ply could replace the Pinex. Prior to using the thick clear plastic I used thin plastic sheeting of 0.0015 inch but found this rapidly became grimy with dust and sprays and it had to be replaced each year because of its tendency to reduce light transmission over a period of time.

As I said previously, the floor is covered with plastic sheeting, river shingle and stones which prevents losses in the soil — no doubt sawdust would do equally as well.

I estimate that if I did not have the insulation the fan heater would have to be increased to 1,000 watts (1 kw) i.e. double to maintain the minimum temperature of 15 °C (60 °F). The higher powered heater of course would mean increased bills.

Every hot house has a thermometer but where is it positioned? In my house the recording maxi-min thermometer is mounted well away from the heater about half way up the wall and out of any direct sunlight which may come in through the glass end and give false readings.



Cymbidium Leodogran 'Cradlemont' has proved a popular second generation miniature because of its ease of culture and free flowering habit. The colourful flowers are carried on a strong stem and displayed above the foliage. The clone derives from the cross of C.Sweetheart X Liliana made by Bowers & Wigelsworth of California and registered in 1963 by Paul Miller also of California. Species in the background of this cross are C.tracyanum, C.i'ansonii, C.insigne, C.eburneum, C.lowianum, C.grandiflorum, C.pumilum.

A Thought: While talking about maintaining the heat in a hot house — have you ever thought what might happen one very cold frosty night if the heating failed due to a power failure, blown fuse, or the like? It could easily happen and the house drop to freezing temperatures. I know the colder genera like Cymbidiums will stand it, but I can not afford to try it with Phalaenopsis or other warm genera — the least damage would be all the flower buds go brown and drop off, and the worst the ultimate loss of many plants. In a future article I will tell of a method which I have incorporated to warn of such an occurrence.

My Ten Favourite Catasetums

by Shirley Goodwin

With 110 different species in existence, the following must rank as my favourites:

WARSCEWICZII a small-growing plant with pendulous spikes of green striped flowers, very fragrant and delicate.

OERSTEDII heavily scented flowers, green with purple markings, and with its frilly lip uppermost.

RUSSELLIANUM pendulous spikes of lovely grey-green flowers with dark green striping, and a rose-like scent.

VIRIDIFLAVUM strange hooded flowers in pale green with the lip uppermost and sepals and petals like folded wings.

JURUENSE brown spotted outstretched flowers with a spiky white lip.

PILEATUM certainly the most dramatic Catasetum, and the national flower of Venezuela. It has large flat ivory-white flowers with an almost round lip.

FIMBRIATUM spicy-scented yellow flowers with red spots. The lip is fan-shaped and frilled around the edge.

TRULLA another species with a fimbriate lip. The sepals and petals are green striped with brown.

SACCATUM resembling some strange insect, these flowers look triangular at first glance, and are in apple-green shades.

BICOLOR a delightful plant with masses of purple flowers, the sepals and petals held stiffly back and the short white lip in contrast.

All in all, a fascinating genus, and as one section of it produces separate and completely different male and female flowers at different times or on different spikes, you never know just what you will get, although the male flowers tend to predominate, especially in cultivation. Coupled with the habit of shooting its pollen at the slightest touch, Catasetums are one of the most complex and interesting of all orchids.

P.O. Box 2039, Rotorua.

OCNZ Awards 1979

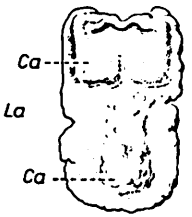
Award No. 1/79: Vanda Chavananand — Mr J. Brljevich — HCC. Dimensions: Natural Spread 100mm; Dorsal Sepals Length 50mm, Width 50mm; Lateral Sepals Length 55mm, Width 53mm; Petals Length 47mm, Width 48mm; Lip Length 20mm, Width 20mm. Petals, sepals and lip mauve and burgundy. 1 spike. 16 blooms, 2 buds.

NEW ZEALAND INDIGENOUS ORCHIDS

by Albert H. Blackmore

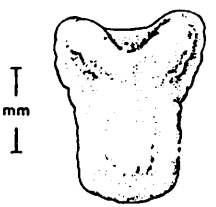
(Continued from last issue)

14 **MICROTIS** has three species in New Zealand, namely oligantha, parviflora and unifolia. They are terrestrial.



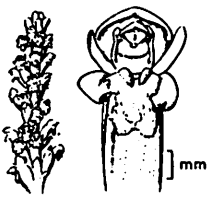
M. oligantha

(a) oligantha, found in North Island central highlands. In South Island it is widespread and locally abundant in Canterbury foothills in tussock grasslands both damp and dry places. Flowers green, widely spaced in time, October to February.



M. parviflora

(b) parviflora, found north of Auckland to as far south as Volcanic Plateau and south from Takaka district on dry banks. The three Microtis species appear to like country which freezes in winter. Flowers green to yellowish green, labellum broad at base. They are very small and are crowded on the stem. Flowers October to February.

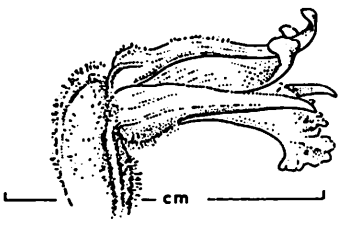


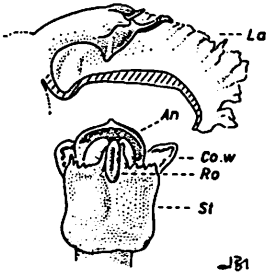
M. unifolia

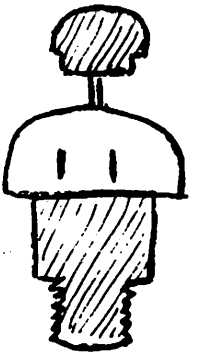
(c) unifolia, found in both Islands on open banks and in poor highland grasslands. Flowers green, from October to February.

Note that the three species are distinguished by the labellum and callus as seen in drawings.

15 **SPIRANTHES** has one species namely sinensis. A terrestrial is found in both Islands from sea level to 3000 feet in grassy and scrubby damp places. Flowers small, pretty pink or white, with white labellum. Flowers fragrant, October to March according to altitude.







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