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## Contents



## Editorial

### Toowoomba 1993

I attended the Second Australasian Native Orchid Conference in Toowoomba, Southern Queensland, on 17-19 September. The Carnival of Flowers is an annual spring event there, and the whole atmosphere was like Hamilton on Show Day.

The Australians at this conference were for the most part those dedicated to growing and hybridising their native orchids. Papers on that subject prevailed, and since the main species in Queensland are the epiphytes, discussion on (and displays of) epiphyte hybrids dominated.

This has been an area our Group has neglected, while we have been devoted to clarifying what we know of the wild species - a conservation rather than a cultivation and display emphasis - and I suppose it raises the old questions about the value versus the danger to conservation of cultivation. This conference finally convinced me: the fact of thousands of flasks of native species for sale must reduce pressure on wild populations.

Interestingly, while there I met Christchurch couple Gaile and John Creegan, and Aucklander David Young, who intend to form South and North Island New Zealand groups affiliated

with A.N.O.S. with hybridisation and shows in mind. I have invited them to keep us in touch via the pages of the *Journal*.

The season was late for terrestrials in that hot country, but I was delighted to see *Pterostylis baptistii* - a big green and brown species - and the red *P. pedunculata*, as well as *P. hildae* and *P. erecta*. The *Caladenia carnea* on display was much bigger than any I have seen from New Zealand, and must be a different species.

It was good too to hear of terrestrial hybridisation in South Australia - using *Caladenias*, *Pterostylises*, *Thelymitras* - and others, and to see the interesting results - often sterile after only a couple of generations, unlike the epiphyte hybrids which seem to retain fertility much longer.

On the last day conservation was the major theme. Neville Howcroft of Papua-New Guinea presented a delightful paper on the vast orchid flora of his country, beautifully illustrated - there are twelve genera that are represented by species growing at over 3500 metres altitude! Tad Bartareau gave a fascinating account of his Ph.D. studies on pollination of Queensland epiphytes by native bees; Kingsley Dixon described conservation of West Australian orchids in masterly fashion. All of it had lessons for us.

There were dark hints of the name changes to come: *Dendrobium* will be split into several genera - and ours probably isn't going to be a *Dendrobium*. Likewise *Pterostylis* and *Caladenia* will become several genera (the big filamentous Australian species will be separated off). Some recognised species will be recognised as hybrids. Oh dear.

As always at such events, the contacts made in the intervals and at the social functions were as valuable as the formal presentations.

## *Pterostylis linearis*

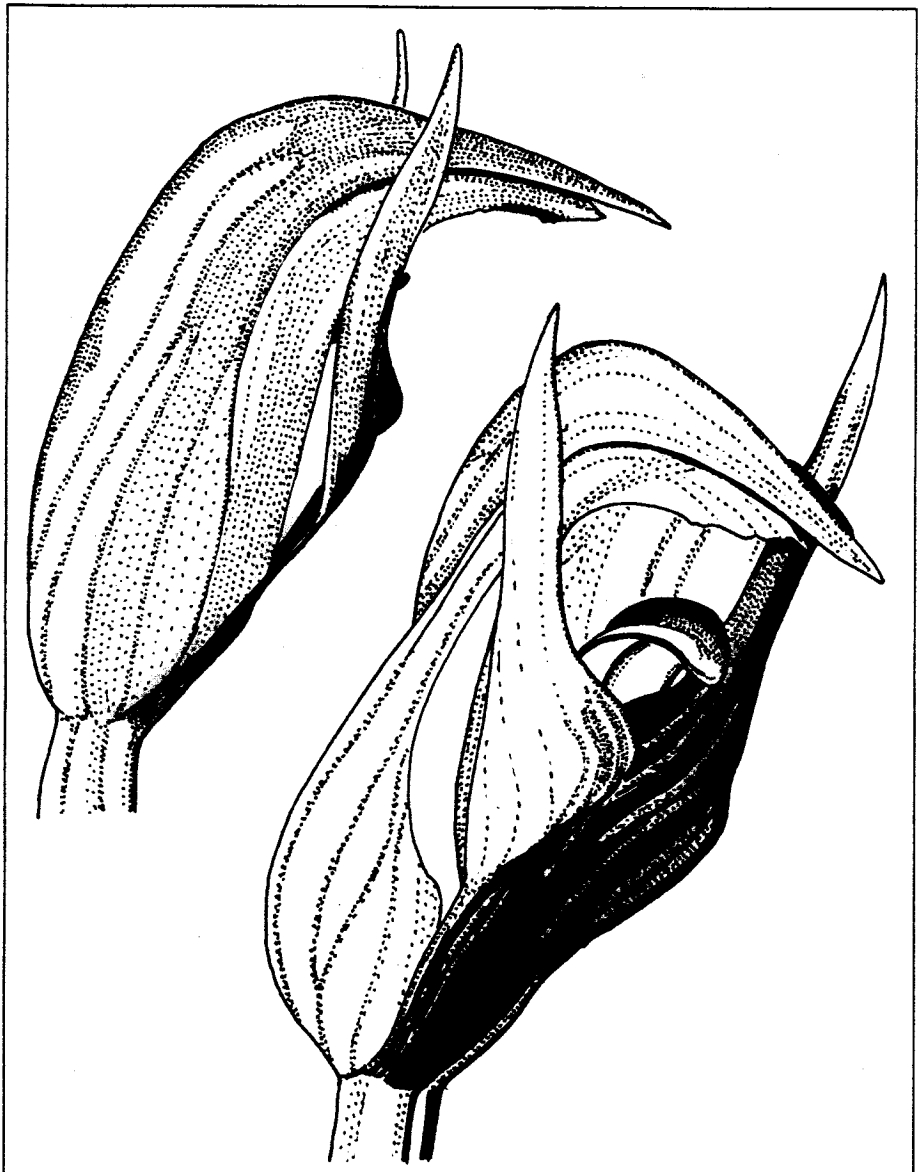
In 1949 Dan Hatch described a *Pterostylis* he found in the *Hypolaena** bogs of the Central Volcanic Plateau in 1944 as *P. furcata* var. *linearis*, but Lucy Moore included it under *P. montana*. Many now consider *P. linearis* to be a species separate from *P. montana* and *P. furcata*.

I had not seen it until in December last year Bruce Irwin directed me to a swamp ("Take your gumboots" he warned) left off the main road in past Irirangi south of Waiouru. We passed a side-road called Maukuuku (an old Maori word for orchid tubers) which I took to be a good omen, and shortly came to a stop near the corner of a wetland.

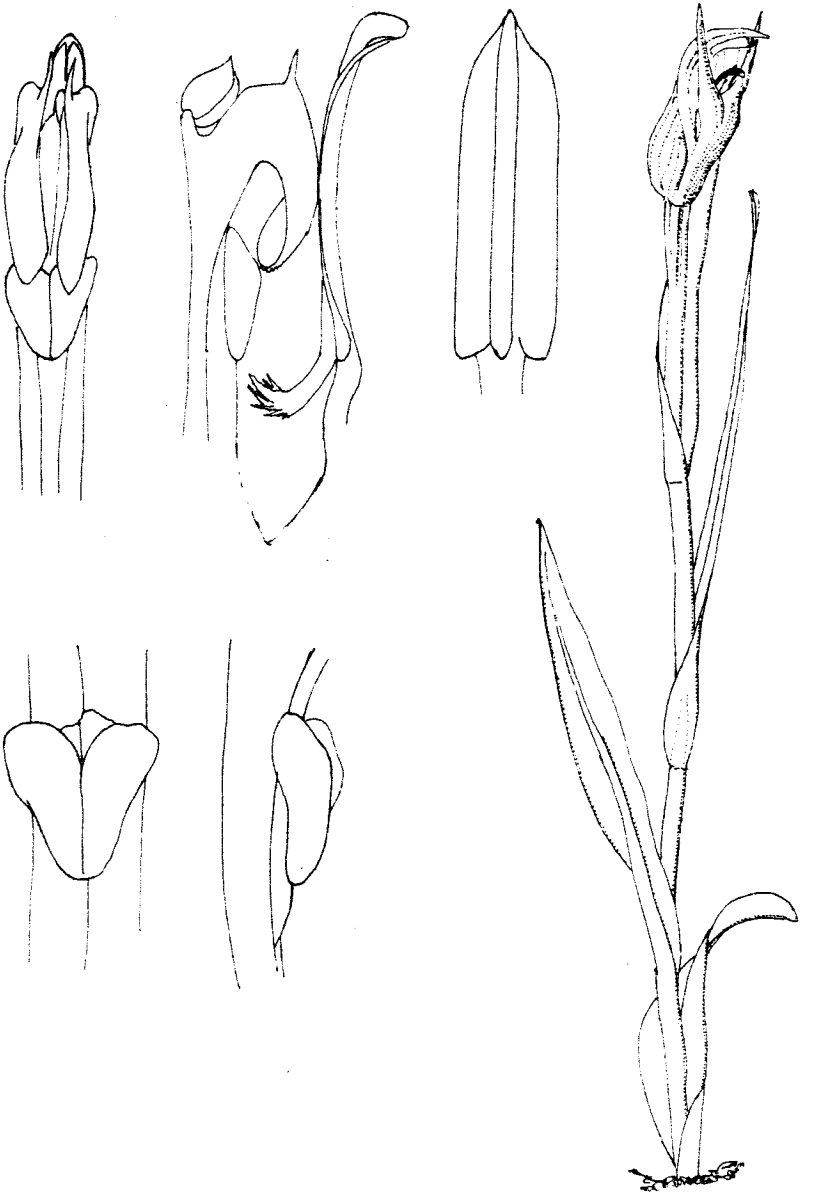
The *Pterostylis* were not exactly thick on the ground, and it took me some time to find even a few young flowerless plants, but then I saw a couple in flower. First impressions? an unusually pale sickly-looking white-green, not the bronze of *P. montana*, but in many ways structurally similar, so one could see how Lucy Moore could regard it as the same.

There were more differences than just the colour though: the bog habitat is wetter, the leaves more erect; the flower leaning forward somewhat, its flat lateral sepals erect, less wide-spreading, straight rather than curled; the galea slender (less "box-like") than that of *P. montana*. The labellum is straight (does not twist), and the stigma is quite heart-shaped, as opposed to the prominent but by no means cordate stigma of the *P. montana* specimens I have seen.

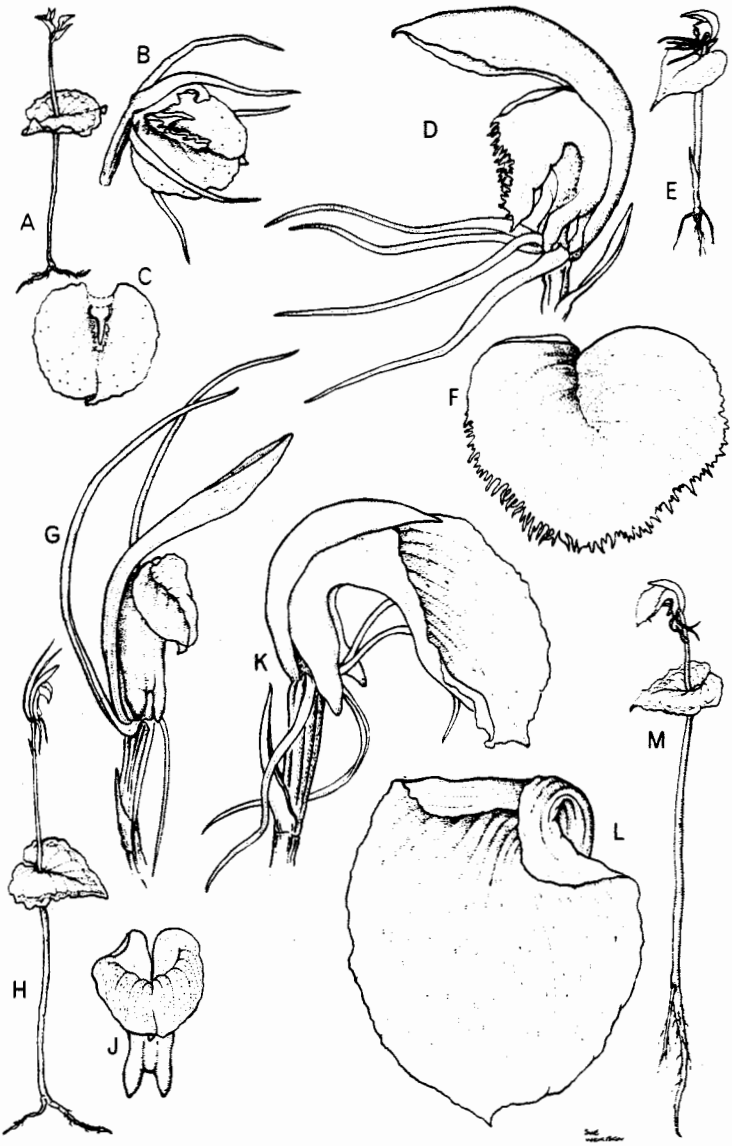
* *Hypolaena* is a wiry rush now known as *Calorophus*. It forms hummocks in the swamps, and *Pterostylis linearis* grows on the hummocks.



*Pterostylis linearis*



*Pterostylis linearis:* (clockwise from top left) - column, column & labellum, labellum, plant, stigma.




## Close relations

*Acianthus* and *Corybas* species: one of the excellent illustrations by S. Wickison from BA Lewis and PJ Cribb's *Orchids of the Solomon Islands and Bougainville*. Royal Botanic Gardens, Kew, 1991. p53.

A-C *A. vulcanicus;* D-F *C. gemmatus;* G-J *C. mirabilis;* K-M *C. ~~longipetalus~~ longipedunculata.*

## Original papers

# ***Corybas longipetalus* (Hatch) Hatch *nom. illeg.***

by Brian Molloy, Manaaki Whenua - Landcare Research, Lincoln.

In the last issue of this journal, Dan Hatch formally raised *Corybas macranthus* var. *longipetalus* Hatch to species rank, using the combination *Corybas longipetalus* (Hatch) Hatch. However, since this name is spelled exactly like the name based on a different type that was previously and validly published for a New Guinean orchid of the same rank, it is illegitimate in terms of Article 64 of the *International code of botanical nomenclature* (Greuter 1988)[1], and must be rejected. It cannot be taken up and used for the New Zealand orchid so named by Hatch (1993).[2]

The combination *Corybas longipetalus* was first published in 1923 by Rudolph Schlechter, and is based on *Corysanthes longipetala*, the name given to an orchid from West Irian (formerly Dutch New Guinea) by Henry Ridley when he described it in 1916. The formal citation of these names is as follows:

> *Corybas longipetalus* (Ridl.) Schltr. *Feddes Report. Spec. nov. 19:* 21 (1923) based on *Corysanthes longipetala* Ridl. *Trans. Linn. Soc. ser. 2. 9(1):* 207 (1916). Holotype: *C.B.Kloss*, BM (*fide* van Royen 1983).[3]

A copy of van Royen's illustration of *C. longipetalus*, apparently drawn from the holotype, is included below.

Rudolph Schlechter, an esteemed orchidologist, appears elsewhere in the taxonomic literature as an author of New Zealand orchid names, e.g. *Corybas matthewsii* (Cheeseman) Schltr., and *Townsonia viridis* (Hook.f.) Schltr. And Henry Ridley is probably better known for his classic book *The dispersal of plants throughout the world*, published in 1930 by Reeve, London. He also wrote *The Flora of the Malay Peninsula* (1922-25), and was the chief promoter of the rubber trees there.

Although the orchid named *Corybas macranthus* var. *longipetalus* is more correctly placed in the *C. rivularis* complex, I suggest we retain the name *Corybas macranthus* var. *longipetalus* for now because (1) that name is available and identifies unambiguously the orchid from Waitangi Stream, Waiouru described by Hatch in 1947, and (2) the appropriate rank of this orchid is not yet clear from the studies of this complex by Bruce Irwin and myself.

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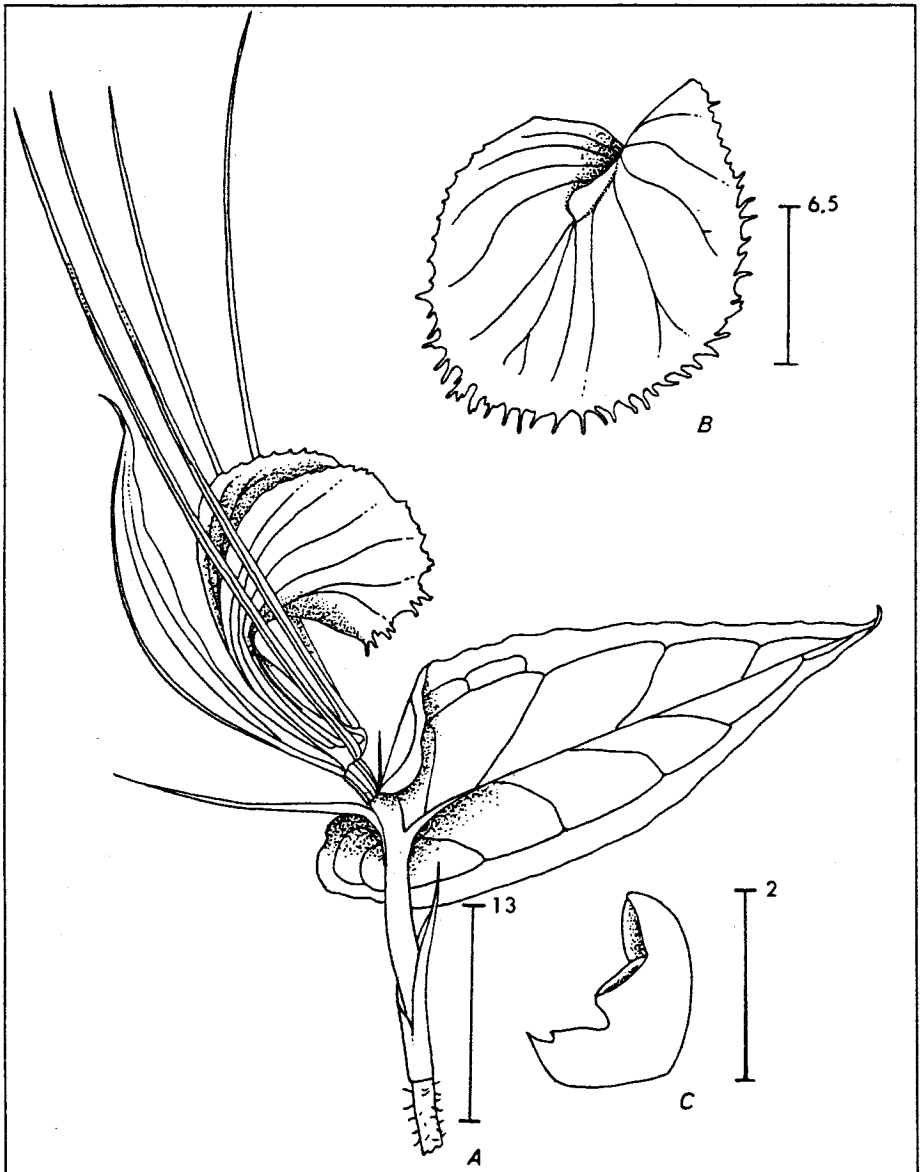



*Corybas longipetalus* (Ridley) Schlechter, from van Royen P. *The genus Corybas (Orchidaceae) in its eastern areas.* Vaduz, J.Gramer, 1983.
Key: A. habit; B. lip, oblique frontal view; C. column with stigma and anther.

## Orchid artists

### Owen Edward Gibson (1928 - 1978)

by Eric Godley, Research Associate, Landcare Research NZ Ltd

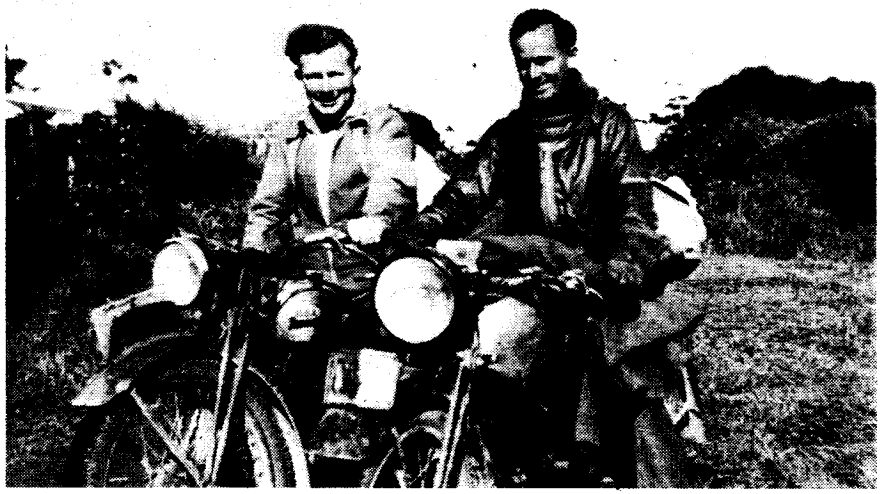
Owen Gibson was born in New Plymouth on 29 March 1928. His father, Cedric T. (Sid) Gibson, a builder with an interest in native plants and horticulture, had been dux of New Plymouth Boys' High School. Owen went there too, from 1942 to 1944, and his record notes that he played junior cricket, participated in the Cadet Unit, and "enjoyed craft subjects - especially wood-work at which he was gifted".

By 1944 Owen had also acquired a good knowledge of native plants. He shared this interest with his friend Bruce Irwin, who had come from Wanganui in 1939 as a seventeen year old, to become a draughting cadet in the Department of Lands and Survey, New Plymouth. Here Irwin met Sid Gibson who encouraged his interest in plants, and in orchids in particular. Until October 1943, when his pilot training began, Irwin worked in a military mapping group at New Plymouth and later Manaia (South Taranaki); and during this time he often saw Sid and Owen Gibson, and much of the joint work on Mount Egmont was done.

In 1945, after leaving school and finding no vacancies in the Forest Service, Gibson went to work at Duncan and Davies. He studied painting in watercolour at night school, and became interested in painting native orchids. In May 1946, just before his eighteenth birthday, he discovered *Corybas aconitiflorus (C. cheesemanii)* at New Plymouth;[1] and in December 1947 he sent fresh material of *Townsonia viridis (Acianthus viridis)* to E.D. Hatch from the Ohakune Track, the first North Island record.[2]

In July 1947, Irwin returned from a year in Japan with Jayforce, and shortly after was posted to the Land Development Branch of Lands and Survey at Te Kuiti. Thereafter his main contact with Gibson was by letter. Meanwhile their collections and those of E.S. Richardson from Mount Egmont and its foothills gave new localities for six species of *Pterostylis*.[2] Also from Mount Egmont was a novel greenhood which Gibson drew.[3,4] In naming this species *Pterostylis irsoniana* Hatch "endeavoured to acknowledge the labours and enthusiasm of Messrs. J.B. Irwin and O.E. Gibson, who between them have done much to elucidate the orchid flora of Mount Egmont".[3] Their work led to a list of 29 orchids from the Mount Egmont Ranges, published in 1953.[5]

In January 1949 Gibson collected on Ruapehu again, finding *Acianthus viridis* on the southern slopes, and *Gastrodia minor* at the Waihohonui Hut;[6] and in October of that year he and Irwin went north on their motorbikes and spent several days near Kaitaia "searching for some of the rare orchids reported many years previously by R.H. and H.B. Matthews".[7] They discovered *Thelymitra* "sanscilia",[8] and near Wellsford, on the way back, Gibson found in fruit a peculiar orchid which lacked leaves and tubers.[7] They brought their novelties to Dan Hatch's home at Laingholm, Auckland, where Dan took the photo reproduced here and confirmed that the Wellsford orchid was something special. He later called it *Corybas saprophyticus* and then *C. cryptanthus*.[8,9]



Owen Gibson and Bruce Irwin at Dan Hatch's house, Laingholm, October 1949, after discovering *Corybas cryptanthus* near Wellsford

Hatch and Gibson collected together on Mount Egmont in December 1950;[6] and Irwin and Gibson's last excursion together was about 1958 to Arthurs Pass. In 1961 Gibson and his wife Phyl went into business at Waitara, where their "Seaview Plant Farm" specialised in Proteaceae. Owen named *Leucodendron* "Safari Sunset" bred by Mr Bell, Wanganui, and the flax "Yellow Wave" bred by Felix Jury, Waitara.

In June 1978, after a long illness, this exceptionally keen-eyed orchid collector and artist died at Waitara. His ashes were scattered on Mount Egmont.

For help with this note I am very grateful to Mrs P. Gibson (Waitara), Bruce Irwin (Tauranga), Dan Hatch (Auckland), Mr T.T. Ryder (New Plymouth B.H.S.) and George Fuller (New Plymouth).

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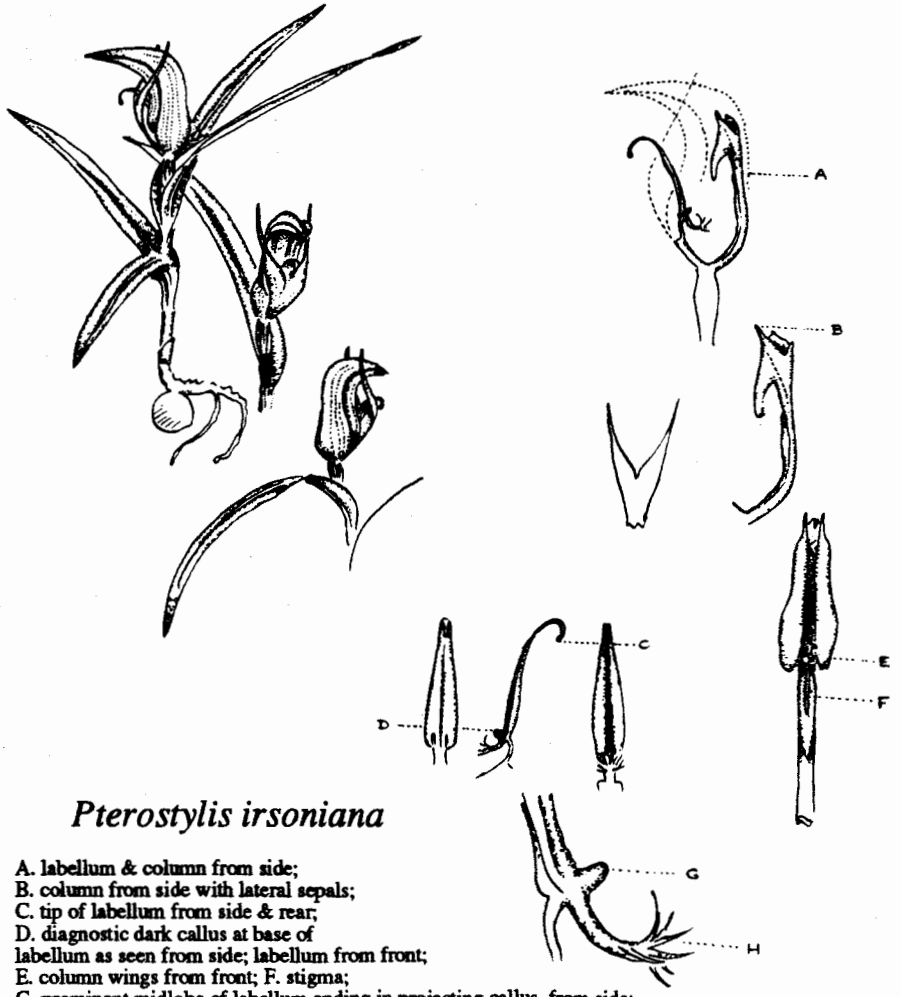
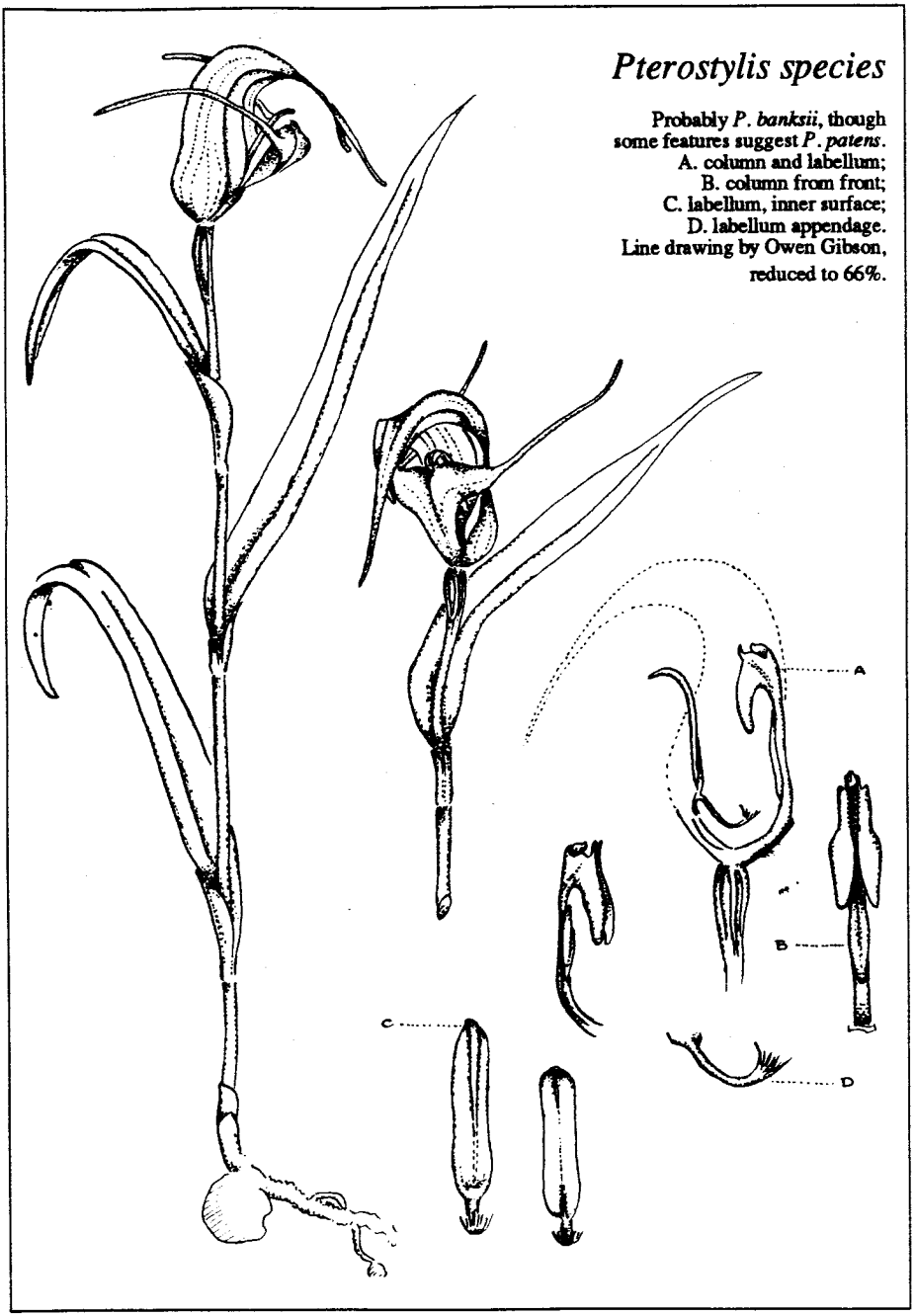


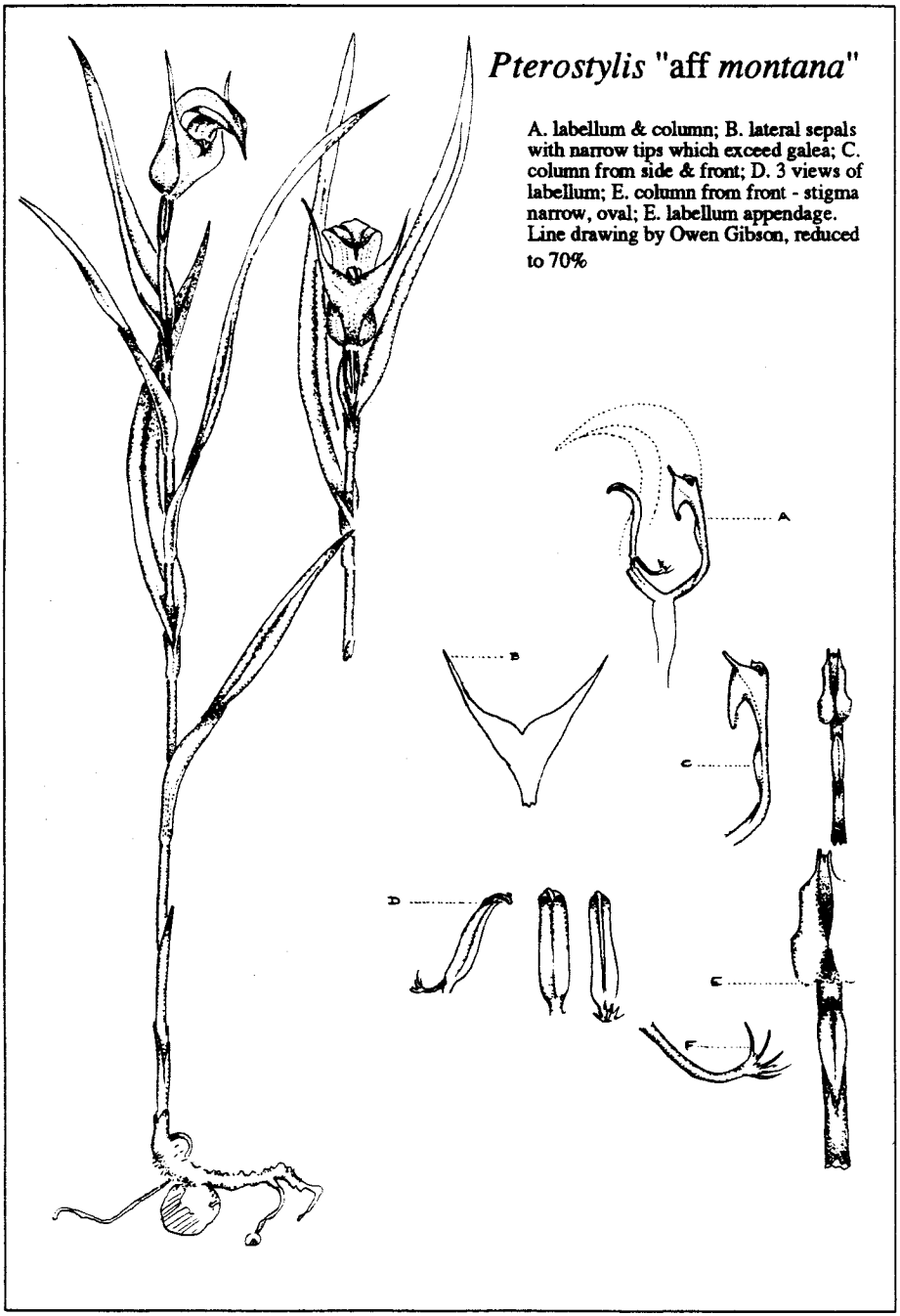

*Pterostylis irsoniana*

A. labellum & column from side;
B. column from side with lateral sepals;
C. tip of labellum from side & rear;
D. diagnostic dark callus at base of labellum as seen from side; labellum from front;
E. column wings from front; F. stigma;
G. prominent midlobe of labellum ending in projecting callus, from side;
H. laciniate tip of labellum appendage.
Line drawing by Owen Gibson, reduced to 77%.



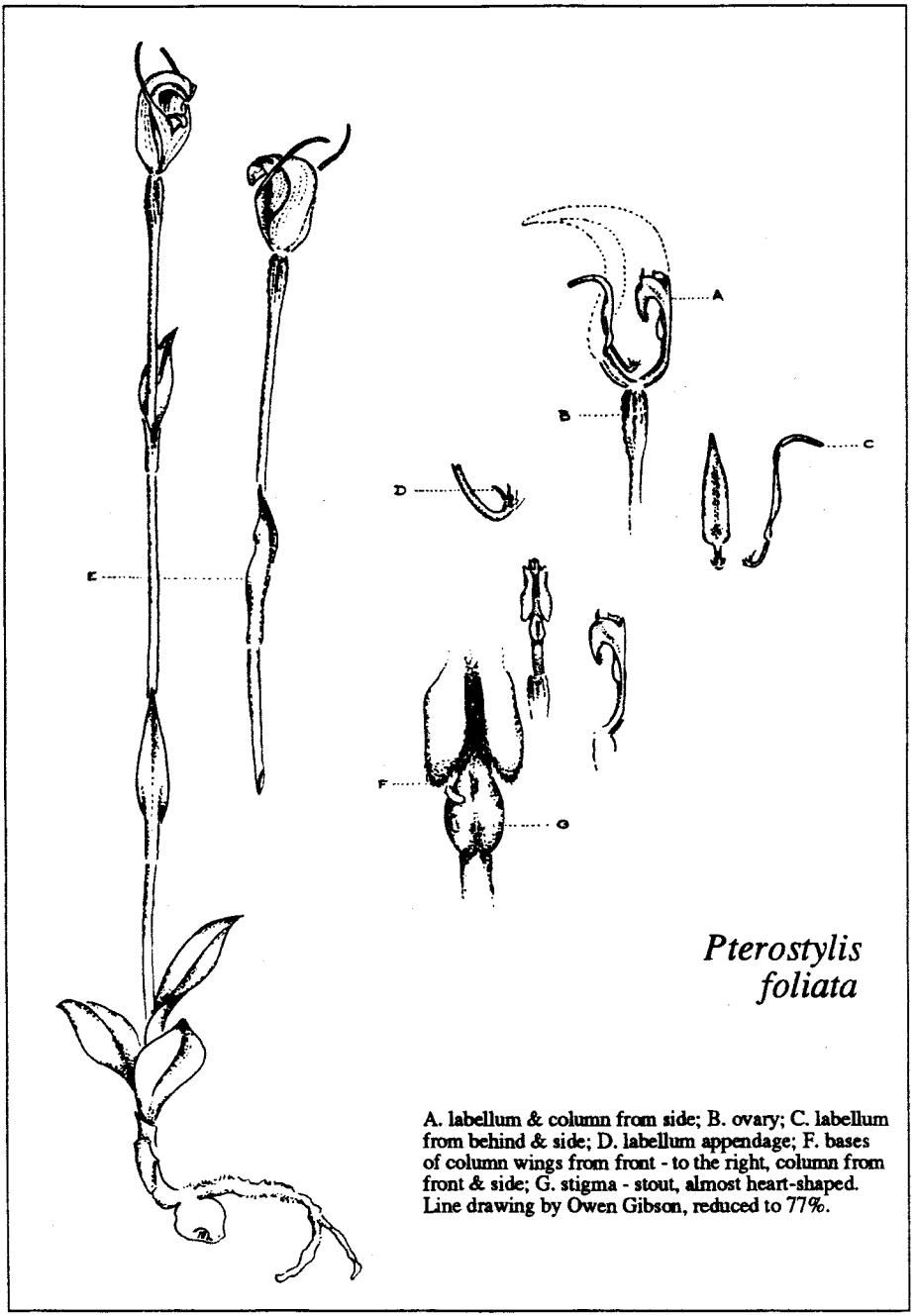

## *Pterostylis species*

Probably *P. banksii*, though some features suggest *P. patens*.
A. column and labellum;
B. column from front;
C. labellum, inner surface;
D. labellum appendage.
Line drawing by Owen Gibson, reduced to 66%.




## *Pterostylis* "aff *montana*"

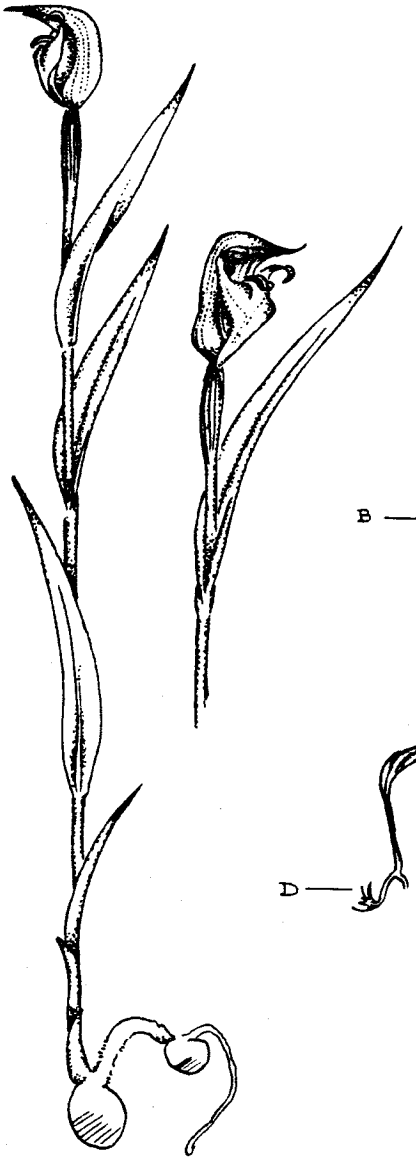
A. labellum & column; B. lateral sepals with narrow tips which exceed galea; C. column from side & front; D. 3 views of labellum; E. column from front - stigma narrow, oval; E. labellum appendage. Line drawing by Owen Gibson, reduced to 70%



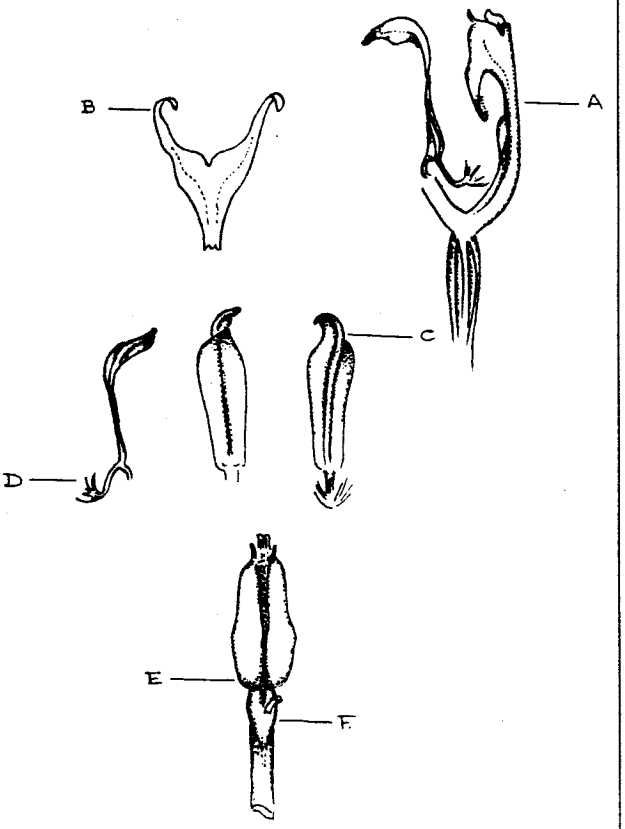

*Pterostylis foliata*

A. labellum & column from side; B. ovary; C. labellum from behind & side; D. labellum appendage; F. bases of column wings from front - to the right, column from front & side; G. stigma - stout, almost heart-shaped. Line drawing by Owen Gibson, reduced to 77%.

# *Pterostylis montana*



A. labellum, column & ovary from side; B. lateral sepals, their margins flat - on mature flowers these sepals often droop as shown; C. labellum from rear, showing prominent raised midrib; at left, labellum from front showing tip strongly twisted to right; D. labellum from side; E. column wings from front; F. stigma. Line drawing by Owen Gibson, reduced to 80%



***Comment** (by Ian St George): a collection of twelve of Owen Gibson's watercolours and line drawings was shown to me by George Fuller in New Plymouth in August. There were watercolours of various scenes, and of several orchids - Drymoanthus adversus, Orthoceras novae-zeelandiae, Thelymitra formosa, Corybas cryptanthus, Pterostylis irsoniana, Acianthus sinclairii and A. viridis, Dendrobium cunninghamii. There were five line drawings, reproduced here reduced in size; the notes on the drawings are based on those made by Bruce Irwin, Tauranga.*

*Owen Gibson is thought to have lent a large collection of his botanical illustrations to somebody shortly before his death in 1978. Their present whereabouts is unknown. Needless to say their discovery would be significant.*

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## Digby Keith Forrester Graham (1935-1979)

Digby Graham came to Whangarei from Shanghai when he was six. As a boy he tramped, watched and photographed birds, and at twelve painted his first orchid.

He gained the Diploma of Fine Arts at Auckland University in 1958, and taught for sixteen years in Christchurch. He was a highly respected art teacher, and attended and spoke at national seminars on art education.

While in Christchurch he had been developing his interest in orchids - notably *Paphiopedilums* - and began to paint them, with the intention of producing a book.

In 1975 he returned to Northland, to teach in Whangarei. That year Digby Graham made a discovery. The cool scientific language of his paper in the *New Zealand Journal of Botany* gives little clue to the thrill of his discovery -

> "The Motutangi Swamp of *c.*5670 ha (14000 acres) lies between Houhora and Rangaunu Harbour on the eastern side of the North Auckland Peninsula (NZMS 1 N6). Its peaty soil is densely covered with rushes, interspersed with flax and manuka. On 31 August 1975 I found an unfamiliar orchid near the western edge of the swamp. About two dozen plants were seen, none with any sign of a flowering scape. By 27 October several plants had developing scapes and one of these plants, transplanted to Whangarei, flowered in the first week of November, producing seven flowers. It was then identified as one of the Australian tongue orchids, *Cryptostylis subulata* (Labill.) Reichb.f., representing a genus not previously reported in New Zealand. On a third visit to the area, on 7 February 1976, further observations were made, colour photographs were taken, and a representative series of specimens was collected and pressed." [1]

It was the first New Zealand record of *Cryptostylis subulata*, one of a number of sometime visiting Australian orchids, their light seed no doubt blown across the Tasman on the westerly winds. *Cryptostylis subulata* now seems well established in the swamps of Northland.

Digby Graham never did publish his book of *Paphiopedilum* paintings. He died suddenly in 1979, and the book was put together (beautifully) by his widow Robin, who related,

"Digby's research led him into the fascinating world of collectors from time gone by; he found much humour in discovering amusing events in the era of the great "houses" of Great Britain. They provided the basis of anecdotes told and retold with eloquence and delight." [2]

Perhaps in the course of his research he read Anthony West who wrote,

"Many (orchids) are... startling in their mimicries, and their appearance of an altogether animal vitality, their suggestions of carnivorousness, are almost repellent. There are people who are even frightened of them and who can never quite overcome a lingering suspicion that the most ordinary purple airline orchid may not have it in its power to sink its fangs into any flesh carelessly exposed to it, to cling there, fattening itself like a leech. This was a favorite fantasy of the last century when the craze for hothouse orchids was at its height, and there must be a dozen variants of the story of the orchid collector attacked and drained of his blood by his latest aquisition." [3]

Even the lugubrious R.M. Laing (or was it Ellen Blackwell?) was moved to write of orchids -

"Grasshoppers, mosquitos, dragonflies, butterflies, swans, pelicans, the skin of the tiger and of the leopard, the eyes and teeth of the lynx, the face of the bull, the grin of the monkey, the head of the serpent, the tail of the rattlesnake, frogs, lizards, even the head of the extinct *Dinotherium*, are all mimicked by them." [4]

Eye of newt, toe of frog - a witch's plant.

One of Digby Graham's drawings from Northland is the spider orchid *Corybas rivularis* (is it Bruce Irwin's *Corybas* "Kerikeri"?); it hints darkly at just such a notion. He brings up from our subconscious a suspicion we always had about the orchid. We look and we say, my goodness, he's right, there *is* something sinister about it: there is a weird, brooding animal quality. He exaggerates the curves, rounds the planes, fleshes out the thin parts. His spider orchid has tentacles instead of petals and sepals, the opening of the labellum is the gorge of an alien creature. There is a lowering threat.

This is surrealism in botanical art.

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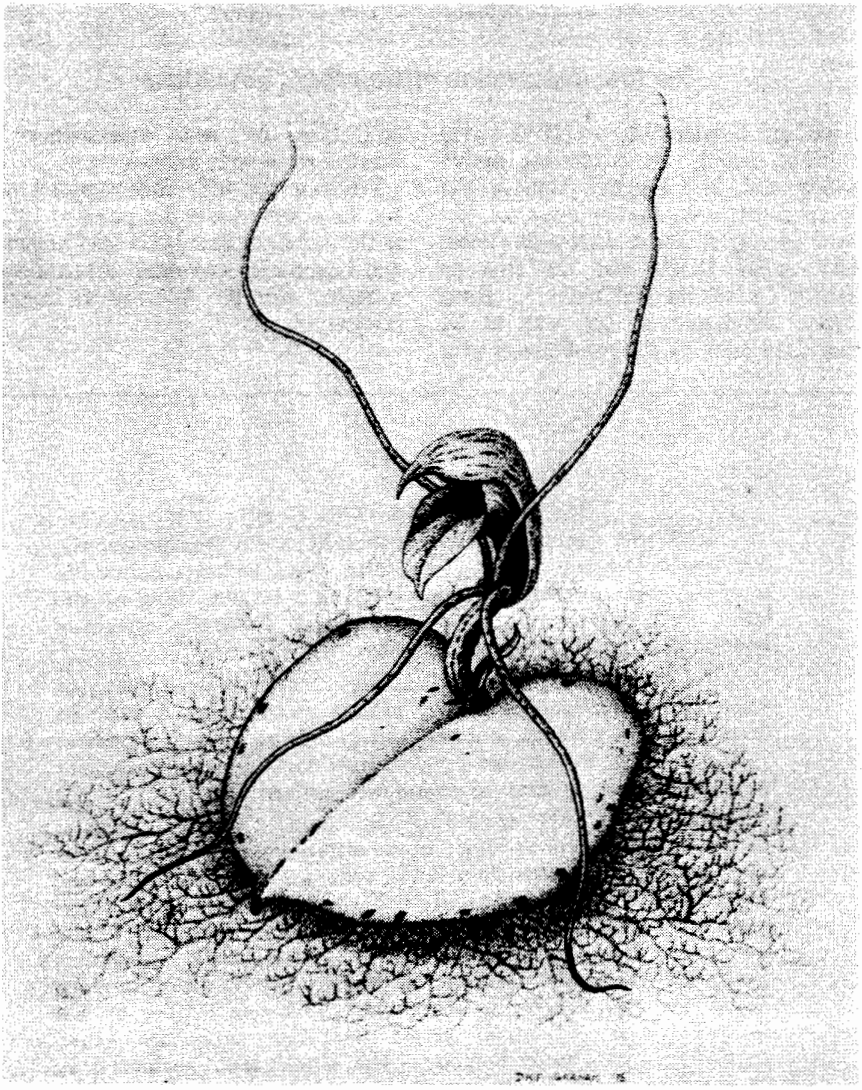


Spider orchid, *Corybas rivularis*. Pen drawing by Digby Graham 1975.

Historical reprint

## The first description of *Caladenia iridescens*

Dr Richard Sanders Rogers (1862-1942) published widely on Australian native orchids, and, in a lengthy paper in the *Transactions and Proceedings of the Royal Society of South Australia* (1920; XLIV: p328 tXIII) was the first to describe *Caladenia iridescens*. Rosa Fiveash illustrated it: she was to be recognised later by the publication of a collection of her watercolours of Australian orchids in book form.

Whether the tall, dull-coloured plant we have seen under the pines at Iwitahi is the same as this 10-20cm "unusually and beautifully coloured" Australian, is a matter (for the moment at least) of conjecture.

CALADENIA IRIDESCENS, n. sp.

A slender plant 10-20 cm. in height; stem reddish-purple, beset with fine hairs, a small clasping subulate bract below the middle, a tubular scarious sheath from 5-10 mm. long at the base; leaf narrow-linear, 5-8 cm. long generally reaching beyond the bract, sparsely hirsute.

Flowers usually solitary, rarely 2, a dusky-red mingled with iridescent golden tints, rather more than 2 cm. in diameter; ovary hairy, narrow, elongated, on a slender pedicel 7-10 mm. long, subtended by a narrow acute lanceolate bract; habit approaching that of *Caladenia carnea*, Br.

Lateral sepals spreading as in *C. carnea*, falcate-lanceolate, 11-13 mm. long; upper-surface a deep red (almost claret-colour), sometimes passing into a greenish-gold at the tips; lower-surface dull gold, iridescent, studded with dark-reddish glands. Dorsal sepal erect but much incurved, about 10 mm. long, contracted towards the base, spathulo-lanceolate, rather wider than lateral sepals, its dorsal surface glandular and similar in colour to the lower surface of the lateral sepals. Lateral petals narrower than the other segments, about same length as the dorsal sepal, coloured as in the case of the lateral sepals.

Labellum ovate on a short claw, about 5 mm. long; lateral lobes definite, erect, rather acute with entire margins and transverse red stripes, anteriorly merging into 2 or 3

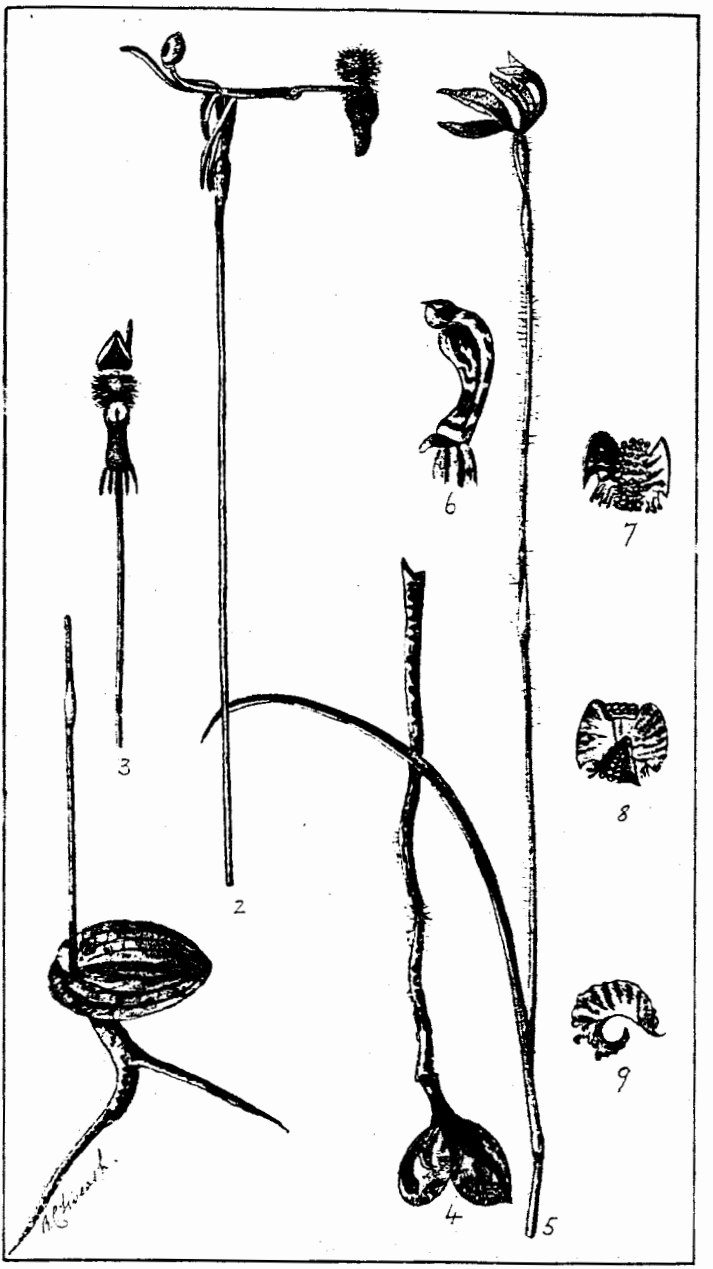
blunt or clavate teeth; the middle lobe rather broadly triangular, recurved, dark purple and very glandular, with long clavate glandular calli on its margins; lamina between the lateral lobes entirely covered with rather crowded wide-headed short pedicelled dark-purple calli arranged in four rows, the calli becoming sessile without definite arrangement on the tip of the middle lobe and extending to the extreme apex. Column about 6 mm. long, much incurved in its upper part, wings wide and splotched with red, its dorsum marked with intermittent red lines. Anther pointed, incumbent; pollen-masses in two lamellated somewhat triangular pairs easily removed on a needle, no caudicular or other connection with the rostellum. Stigma situated immediately below the anther, fleshy, concave, semicircular in its lower border, the upper border passing into a sticky triangular rostellum.

*Hab.* — Hall Gap, Grampian Mts., Victoria, Mr. E. E. Pescott, 30/10/13.

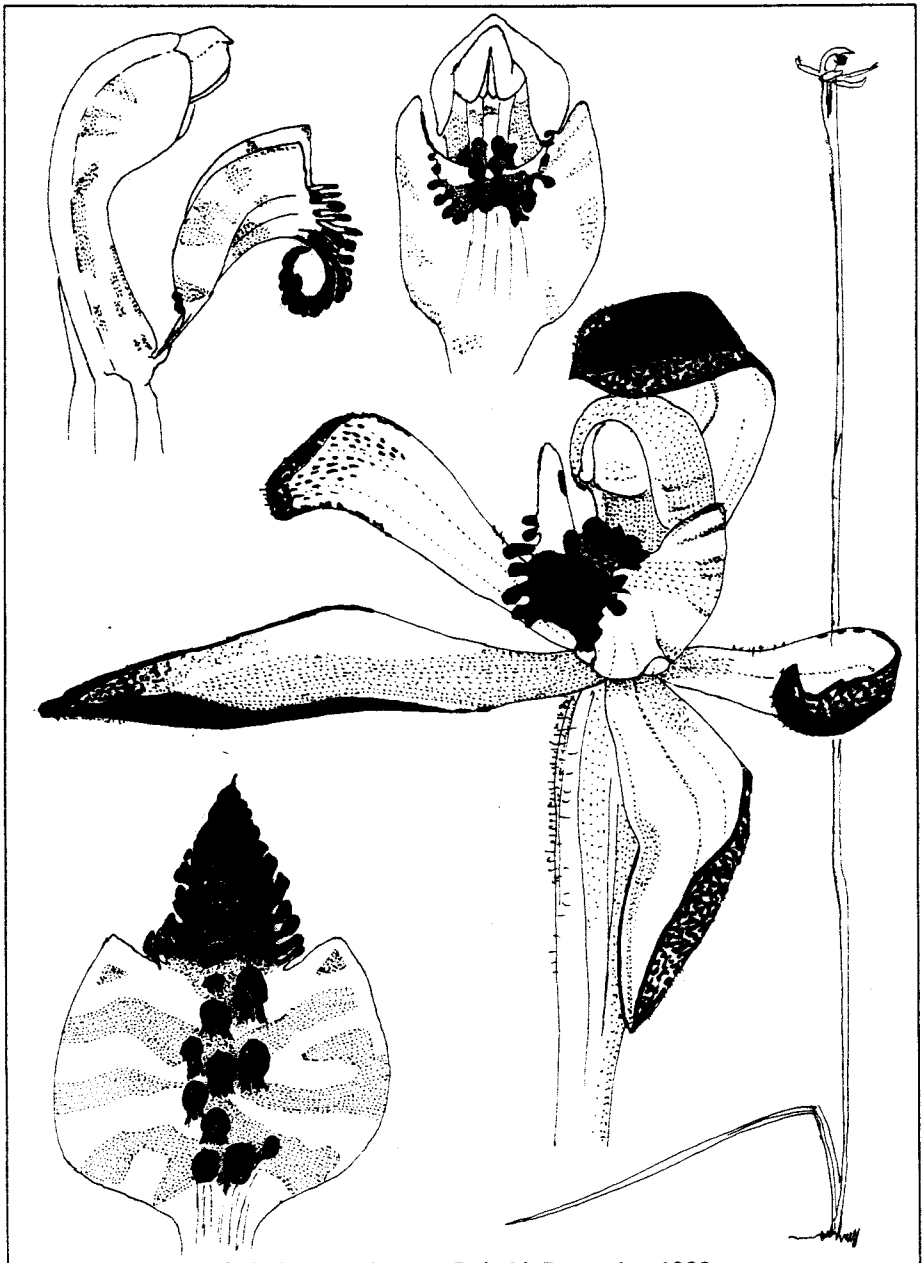
The unusual and beautiful colouring of this orchid gives it at first a very distinctive appearance, but a careful analysis shows that it has close morphological affinities with *Caladenia congesta*, Br., and *C. testacea*, Br. *C. congesta* has, however, very much larger flowers which are almost always multiple; the labellum has a very long narrow middle lobe, without any marginal appendages but completely covered with densely-packed fleshy flat-topped calli, arranged transversely so as to give to this lobe a somewhat terete corded appearance; on the lamina behind these, the calli are still as densely packed, they are all sessile with the exception of the pair next to the claw, they are very fleshy and flat-topped. and are arranged longitudinally in two rather obscure rows; the labellum is nearly twice as long as that of the new species.

In *C. testacea* the lateral lobes of the labellum are usually ill defined and sometimes practically obsolete; the calli Oakleigh, Warrandyte, Healesville, Dandenong (C. French, junr.); Gisborne (G. Lydell); Sale (T. S. Hart); Blackburn (The Misses Coleman); Queenscliffe (G. Coghill); Sandringham (A. H. Tadgell); Port Albert.

It blooms in September and October.




*Drakaea Jeanensis.* *Caladenia iridescens.*



*Caladenia iridescens*, Iwitahi, December 1992

# Notes

## Tongariro Natural History Society Memorial Award

The Secretary, Tongariro Natural History Society, PO Box 238, Turangi.

CLOSING DATE 31 MAY

The award is offered annually and is open to any applicant for study concerned with flora and fauna, geology, vulcanology, weather and natural and human history of Tongariro National Park. The award will be up to $1000.

❀ Conservationists - see if this doesn't make your teeth itch: (from the *Orchadian* 1993; 10 (12): 473): "Between May and July this year (1992) 44 Antarctic beech trees, some more than 800 years old, have been cut down near Plateau Beech Picnic Area in Werrikimbe National Park. These old giants were brought down so the vandals could get the orchids high up in the canopy."

❀ Maureen Young reports *Corybas macranthus* in the north: "I have recorded it from Logues Bush, Tomarata, and from the hills north of Mangawhai. Neither of these localities is very far north of Warkworth, but I have other records from the Waiotemarama track just south of the Hokianga Harbour, and from Maunganui Bluff, where the plants had the largest leaves I have ever seen on a *Corybas*. "

❀ Dan Hatch wrote (about *NOGJ*47) "The *Pterostylis allisonii* you mentioned in Rupp's paper was a manuscript name of HB Matthews'. The plant was actually *P. foliata*, collected in November 1922 'some miles out from Rotorua'

"I was interested in your note on Nancy Adams and the ilustration of *P. patens*. This was the plant that started me on my career as an amateur taxonomist and I converted her 1970 painting into a bookplate" (below).

*The drawing in the last issue was wrongly dated 1986 - it should have read 1966. The painting from which Dan took his bookplate was done later -*

❀ Noeleen Clements wrote (20 September), "Local orchids become more interesting each week with *Pterostylis trullifolia*, *P. alobula* and *P. rubricaulis* still flowering; *Caladenia alata* in great profusion; *Cyrtostylis oblonga* flowering well; buds showing on other *Caladenia*, *Prasophyllum* and *Thelymitra* species"

❀ *We are always on the lookout for observations, papers, notes, orchid records etc. for the Journal. Please write - the more people do so, the more interesting the Journal will be - Ed.*

❀ Steve Savage wrote, "I have recently photographed a double-flowered *Pterostylis alobula*. One flower opened for only 4-6 days and seemed to be perfect; the other seemed to be blind and stayed tightly in bud. Plant height 5.5cm; both flowers arose from the fourth leaf area: Mahikapau Sound, in open manuka scrub on a dry north-facing hillside grazed by goats. The other plants in the colony were single-flowered but very small. Nearby a friend found a double-flowered *P. montana*, both flowers perfect."

❀ Bruce Irwin is still seeking plants from the *Corybas rivularis* complex (see *NOGJ*47). Please send them to him at 195 Bellevue Rd, Otumoetai, Tauranga.

❀ Ian St George is similarly seeking various *C. trilobus* specimens. At 22 Orchard St, Wadestown, Wellington.

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## Australian cultivation notes

We reprint here a number of excerpts on cultivation from the publications of various groups affiliated to the Australasian Native Orchid Society. Much of the advice will apply to NZ species, but not all techniques that are appropriate for Australia are apt here. We are a cooler and damper country overall, and experimentation with local materials and conditions is likely to provide better results than rote adhesion to Australian formulae.

Growers should refer to Doug McCrae's chapters in *The New Zealand orchids: natural history and cultivation* for details on New Zealand conditions.

1. Cady L. Growing ground orchids. Native Orchid Society of Queensland's *Native Orchid Bulletin* 1993; 24 (9): 97 (in turn reprinted from the *Journal* of the Australasian Native Orchid Society [Darling Downs Group] October 1971).
2. Neil Finch's formula for bark treatment. Native Orchid Society of Queensland's *Native Orchid Bulletin* 1993; 24 (9): 99.
3. Marshall L. Discussing potting mixes with Helen Richards. A.N.O.S. Victorian Group *Bulletin* 1993 (May): p7.
4. Kasomenakis S. Growing Australian terrestrial orchids under lights. A.N.O.S. Victorian Group *Bulletin* 1993 (April): p8 (reprinted there from other publications in 1989 and 1990).

## 1. Growing ground orchids
### by Leo Cady, Kiama

This statement covers a large number of species, for wherever we travel we are usually sure of finding some type of the 'Groundies' present. The writer only intends to discuss the method he has found to be successful.

The compost, in which the orchids are to grow, being the all important question, will be discussed first. A mixture is made of black sandy leaf mould, that found under trees in sandstone country is ideal, and soil from the natural habitat of the plant. This soil or loam varies with the genus one is dealing with, and experience will show the grower how much to use. It is thought better to have the mixture a bit on the sandy side to start with, than have it too heavy. To this mixture is added a small part of very old cow manure (powdered). The manure can be left out if not available.

This mixture can be used with success for any of the following genera: Pterostylis (Greenhoods), Caladenia (Spider or other type), Corybas (helmut orchids), Cryptostylis (Tongue orchids), Caleana (Duck orchid), Spiranthes (Ladies tresses), Acianthus (Gnat or Pixie caps). In fact, it can be used with confidence as a basis for any of our terrestrial orchids.

Where plants are found to like a heavier type of soil, the compost is to contain a much larger percentage of the original loam that the plant was collected in, together with a proportion of well-rotted leaf mould. Such plants belong to the genera Thelymitra (Sun orchids), Glossodia (Wax Lip orchid), Prasophyllum (Leek Leafed orchid) and Diuris (double tails).

Potting is of importance as one has to provide perfect drainage. Take your pot, usually a 3 or 4 inch is large enough, Place a large 'crock' over the drainage hole and then add about one inch of granulated charcoal or small chips of old pots, the former being preferred. Add about two inches of compost. The tubers can now be spaced around the pot allowing plenty of room for the plants to multiply. Some of the Pterostylis may make up to four tubers per year. Now the pot can be topped off with compost.

Watering is another important thing to attend to. Overwatering must be avoided at all costs, and it is much better to underwater a plant if in doubt of its dampness. When the dormant period arrives, the compost should be gradually dried off. Dipping is the preferred method of watering.

Repotting should be carried out every year, after giving the plants seven or eight weeks from flowering to harden off their new tubers. This period of drying out varies with different genera. If the tuber is left three to four weeks after the green part of the plant has disappeared, it should be ready to repot.

Shading - this point is one to watch, and the best way to overcome the problem is to take notice of this feature in the plant's natural habitat. If it is found in the full sun as are Thelymitra and Diuris they should be placed in the sunniest end of the glasshouse and the reverse for the shade lovers, the Pterostylis,

Corybas and such. For those people not possessing a bushhouse, a position of semi-shade would be right for the shade plant, and for the sun lovers, a position beside a shrub or under trees where the tree shelters the plants from the midday heat, for these plants like their tubers to be kept cool. If an outside position is used, more care will be required in watering as pots will dry out much faster than in the bush house. Draughts must also be avoided; the more sheltered the position is the better.

Manure is usually a controversial subject with all orchid growers and probably no two would agree to the same thing, but it has been noted that at least two of the above genera(Pterostylis, Cryptostylis) show marked benefit from an occasional dose of weak liquid fowl or cow manure. Both plants show a marked increase in root growth and in larger flowers.

It has also been found that Pterostylis will do equally well in the following two mixtures; tan bark Cymbidium compost, and a mixture of sandy loam, leaf mould and chopped tree fern fibre. The main thing to remember is that they must be provided with perfect drainage.

Terrestrial orchids can be removed at any period of their growth, but preferably just as the plant breaks ground. Tubers vary in depth. It appears to be governed by two things - (a) Climatic conditions and (b) Soil condition. The harder the soil the shallower the tubers usually, but they rarely go deeper than three inches. A sturdy trowel or fork seem the best tools for the job and should be inserted a little away from the plant. It is most important to remove the tuber intact. The soil is then carefully broken away from the tuber and stem which should be kept moist and not allowed to dry out.

## 2. Neil Finch's formula for bark treatment

Chemicals required to treat one bag (1.75 cubic feet) of bark.

1) Mix the following dry chemicals

| | |
|---|---|
| Urea | 130G |
| Dolomite | 350G |
| Potassium sulphate | 25G |
| Ferrous sulphate | 35G |
| Copper sulphate | 10ml (2 teaspoons) |

2) add chemicals to bag of bark
3) fill with water and soak for two weeks
4) drain and rinse thoroughly with fresh water
5) use

## 3. Discussing potting mixes with Helen Richards
by Lorraine Marshall

At the early March meeting Helen Richards led a discussion group during which a number of experienced growers shared their knowledge with the group. The discussion covered ingredients, watering techniques and pre-potting treatment of pinebark.

EPIPHYTES

INGREDIENTS - PINE BARK and GRAVEL (optional)

Some growers use pinebark only while others prefer to add one part of coarse gravel to three parts pinebark. The pinebark must be from mature trees and individual pieces must be hard and thick. Paper thin pieces of bark tend to sit closely together and trap water between their layers while "woody" or "stringy" pieces soak up water and retain moisture within the pot - these situations can cause roots to rot.

Pinebark is sold in several grades from quite small to large, chunky pieces. The grade you select is largely dictated by your shadehouse conditions and the way you water your plants.

Small, seedling size plants generally require a fine grade of bark. Plants plants grown under shadecloth or out in the open need a coarse, open pinebark mix as plants grown in these conditions get watered every time it rains whether they need watering or not. You have more control over plants grown under a solid roof - those in a finer mix will need much less water than those grown in a coarse mix. If there is high humidity in your glasshouse you should use an open mix.

If gravel is used it is preferable to use stones which are the same size as the bark pieces to ensure that pots do not remain wet.

The main things to remember are:

* The mix must not retain water.
* Always sieve the "fines" out of the pinebark before use.
* The mix must be coarse so that plant roots are exposed to air.
* Always repot any new plant purchased.

PREPOTTING TREATMENT

Untreated pinebark should be soaked for three to four days in order to remove harmful substances (toxins?). The pinebark can be sieved to obtain different grades. Large pieces can be broken up by running the lawn mower over them.

WATERING

Water whenever the mix dries out - this varies according to your growing conditions and the weather.

SUPPLIERS

Pinebark can be obtained from most plant nurseries - Debco package a bark which suits many growers. Those with large collections may prefer to purchase from bulk suppliers - two bulk suppliers recommended by members are: Pro Pine, Nursery Lane, Ballarat, and Pine Gro, Bacchus Marsh.

TERRESTRIALS

The basic terrestrial mix consists of:

Coarse Sand - 2 parts
Rich Mountain Loam - 1 part
Leaf Mould - 1 part
Buzzer Chips - 1 part
1 Tablespoon Dolomote or Lime and 1 Tablespoon Blood & Bone per 9 litres of mix.

A mix based on these ingredients suits most terrestrial orchids, however "Rufa" Group *Pterostylis* and *Caladenia* benefit from the addition of an extra part of coarse sand.

Many people find some difficulty in obtaining the ingredients, however this need not be difficult.

LEAF MOULD

Most people are able to obtain leaf litter from gardens or along roadsides. It is illegal to collect leaf litter from National or State Parks. Having obtained your leaves you can then make leaf mould by composting them. One method is to run over the leaves with a lawn mower and then store them in large black plastic bags for 6-12 months. If the leaves are dry it is advisable to dampen them before putting them into storage. Once the leaf mould is formed keep it on the dry side so that it does not continue to break down. It is also advisable to use different grades of leaf mould to ensure a ready supply of nutrients throughout the growing season.

BROWN MOUNTAIN LOAM

Obtained from garden suppliers and nurseries. Check to ensure that it is a rich brown and friable.

BUZZER CHIPS

These can be obtained from school woodwork shops, joinery factories and saw mills. Sieved chain saw chips are also suitable as is fine grade pinebark.

COARSE SAND

Nurseries or garden suppliers. Bulk supplies of coarse sand or fine gravel can be obtained from: Chris Cross Garden Supplies, 17 White Horse Road, Deepdene, or Garfield Sands, 4 Clive Street, Springvale.

Temperature control during the growing period is very important; plants should be kept cool. Many species can even take short periods of near-freezing temperatures without too much harm.

My first attempts at growing these plants failed, I now believe, because I tried growing them in intermediate/warm conditions with other types of orchids. Plants seemed barely to hang on, going dormant too soon and their tuberoids becoming smaller with each growing season. In the summer dormant period, the pots are kept as cool as possible, which means around 70-80°F in my conditions. There is a small circulating fan connected to a timer, going on every other hour during the day and once or twice during the night to help cool the pots.

As for most other orchids, air circulation is important for these plants. There are some exceptions which will be noted below under individual species requirements.

The most important factor for success with these orchids is also the simplest and easiest to provide: the correct potting mix. In nature the plants seem to grow in almost every kind of soil successfully, but in cultivation it has been proven through experience that a sandy, well-draining organic mix suits them best. The following is known as a "basic mix", suitable for most plants (modifications for individual species will be noted later): 2 parts coarse sand, 1 part soil, 1 part wood chips and shavings and 1 part leaf mould.

The first ingredient is self-explanatory. Any type of washed river (builder's) sand, screened to remove the silt and the finest particles, will do. I usually add about 20% aquarium gravel (the plain, natural type) to the screened sand.

The second ingredient is more variable, depending on your geographical location. Australian growers use what they call "mountain soil", which is a rich, heavy loam. I use commercially available organic potting soil, making sure that there are no manures or slow-release fertilisers among the ingredients. Heavy fertilisers, especially if they are inorganic, will certainly kill the plants.

The third ingredient is what the Australians call "buzzer chips", coarse sawdust from hardwoods, softwoods or a mixture of both. Preservative treated woods or particle board shavings should not be used because they contain harmful chemicals. I use a hamster litter mix made up of ponderosa pine shavings, making sure that there are no deodorisers or other chemicals in the mix (for the obvious reasons). These shavings are crumbled into a rough sawdust consistency and are mixed with very fine, seedling-grade bark chips in a ratio of 4 parts shavings to 1 part bark before being combined with the other ingredients.

The fourth ingredient is leaf mould, either commercially available or gathered in the woods. When gathering leaf mould in the woods, include some partially rotted leaves as well.

It is suggested in the literature that a pinch of blood and bone meal be added to the mix. I don't add it because it is not generally available, so I compensate by fertilising lightly every two weeks or so during the growing period with a very weak solution of fish emulsion.

I use only plastic pots because clay tends to dry out too fast under my conditions. I have also read that clay is not a good material for mycorrhizal associations, so I avoid using it for these orchids. A four-inch square pot is the smallest size I use, as anything smaller will dry out too quickly.

After a thin layer of styrofoam "peanuts" or coarse gravel is put on the bottom of the pot for drainage, the pot is filled within two inches from the rim with the appropriate mix. Next the tuberoids are planted with growing tips on top, then covered with a one-inch layer of mix. On top of this, I add a one-quarter to one-half inch layer of dried, chopped pine needles, either white pine (*Pinus strobus*) or any other fine-leaved pine. In Australia growers use *Casuarina* needles, so if these are available in your area, by all means use them. Pine-needle mulch helps the leaves dry out quickly after watering and prevents the excess disturbance of the mix. Most importantly, it keeps the top layer of the mix from drying out severely between waterings. This would seriously disrupt the delicate fungi that are found in this top layer. The pots are then watered well and put under the lights to begin growing. Leaves appear any time from three weeks to two months (or more) after planting, depending on the species.

Pots are kept moist, but not wet, during the growing season. I water about once a week, filling the pot with water once or twice and letting it drain. I also spray the surface of the pots with water between the weekly waterings during the first few months of active growth. Water quality is important, as for all orchids. Fortunately, the tap water in the metropolitan New York area is soft and slightly acidic. I usually let the water stand

overnight in the watering cans to allow any chlorine gas to escape.

Various pests are attracted to these orchids, most of which have soft and succulent leaves. I have used weak solutions of malathion and pentac on the leaves with no adverse reactions from the plants. I have had success with soap solutions (one tablespoon Ivory dishwashing liquid to a gallon of water), using pesticides only as a last resort. Whether using the soap or insecticide solutions, it is better to apply them directly to the leaves with a small brush or cotton swab. This method prevents any excess contamination of the potting mix. Never use fungicides on these plants.

At the end of the growing season (i.e. summer), when the plants begin to yellow and wither, water is withheld until the mix becomes fairly dry, and the mix is kept that way through the summer dormancy. Do not keep the plants bone-dry when dormant; they need a weekly sprinkle to keep from shrivelling excessively. There are some notable exceptions to this, which will be mentioned later. For the first few years the plants are grown, it is a good idea to check up on the tuberoids during the dormant season for extreme dehydration and adjust moisture conditions accordingly. After a while this becomes unnecessary as the grower becomes more experienced.

When repotting I reuse one-half of the old mix for each species because this carries the essential mycorrhiza and minimises drastic changes in the growing media from year to year. Most of these species, as noted earlier, multiply by producing more than one tuberoid (under good conditions) for each one planted, thereby doubling and tripling their numbers. Many of these tuberoids are immature and not large enough to flower the next season. They usually take an additional growing season or two to produce tuberoids large enough to flower.

Species that do not multiply vegetatively, as well as those that do, can be grown from seed. The process is simple. The fine seeds that are produced very rapidly from pollinated flowers are stored in the refrigerator and sown the following season around the parent plants in the pine-needle mulch. Terracotta pots work well for germinating seeds. Very few (if any) seeds germinate if the parent plants or other species from the same genus are not growing in the same pot.

This mulch layer is kept moist during the growing season along with the parent plants. The pinhead-sized tuberoids produced in the first growing season cannot be seen, so the whole pine-needle mulch is transferred to the new pot and the process repeated. In two or three seasons, the plants can be seen and their little tuberoids can be handled a little easier. Obviously, this method is much slower than vegetative propagation, so it is really valuable for species that do not multiply otherwise.

So far, I have sown *Chiloglottis formicifera* seed as an experiment (the species multiplies by vegetative means), and the little seedlings are doing well.

There is a third method for multiplying these plants. It is called tuberoid removal, involving (as the name implies) removal of the newly formed tuberoid in the middle of the growing season. The plant is then forced to produce another (albeit smaller) tuberoid. This method disturbs plants while growing and also cuts growing surfaces, so I am very wary of trying it until I have many more plants of each type for experimentation.

Following is a selection of plants that have proved most suitable for cultivation under my conditions, with special needs of each noted.

*Acianthus exsertus* and *A. fornicatus* have small heart-shaped leaves, one to two inches off the ground, out of which comes a raceme of four to ten mosquito-like flowers in colours of reddish-brown and green. Both need *Pterostylis* growing conditions (described below) and basic potting mix. *Acianthus exsertus* needs to be watered earlier in the season to flower well. Both plants can take lower light, occurring in nature in moist and protected areas. They need to be kept a little moister during dormancy than most *Pterostylis*.

*Caladenia dilatata* has a single hirsute leaf, from the base of which comes a scape carrying a strange, green and brown, spider-like flower. It requires good light (i.e., centre of light fixture and close to the tubes) and basic mix, but with soil replaced by sand. Plants must be kept bone-dry during their dormancy because the tuberoids rot overnight if watered in mid-dormancy. During the growing period, plants need about 25% less water (i.e., longer periods between waterings) than *Pterostylis*. This is not a species for beginners - it is difficult to keep and flower - even though it is reputedly one of the easiest *Caladenia* species to grow.

*Chiloglottis formicifera* is a two-leaved plant that bears single ant-like (hence the specific name) flowers on short scapes. It grows easily with basic mix and *Pterostylis* conditions. For me it is one of the most rewarding Australian terrestrials, flowering dependably every year and multiplying well. Another *Chiloglottis* species I tried, *C. gunnii*, is the complete opposite: very difficult to keep alive and flower.

*Corybas fimbriatus* and *C. hispidus* are two similar species requiring the same care. They are small plants having single, round, ground-hugging leaves one to one and a half inches across with a remarkable crystalline texture. The single flower is very large for the plant and is produced from the centre of the leaf. It is coloured in tones of browns and reds with various degrees of translucency. The flowers look like gaping animal jaws bristling with teeth. Plants need the basic mix with an extra part of leaf mould added, less light than *Pterostylis* and a layer of leaf mould on the surface of the mix under the pine-needle mulch. Keep plants well watered and cool during the growing period, barely moist and as cool as possible when dormant. Do not repot yearly because the plants take a couple of years to become established. In nature they are found growing under ferns and in other very protected situations, so they need high humidity. When flowers appear early on in the growing season, keep an inverted clear plastic cup over the plants; flowers abort very fast in dry air. This species is relatively easy to grow, and *Corybas* is my favourite genus.

*Cryptostylis subulata* is an evergreen plant found near swamps, so it needs ample water year-round. It has long, brittle underground rhizomes, strap-shaped leaves on long petioles and tall flowering stems with reddish-brown flowers. Supply the basic mix with some extra leaf mould and wood shavings. Because of the long rhizomes, a large pot eight inches or over in diameter is recommended. Repot only when absolutely necessary - it resents disturbance.

*Cyrtostylis reniformis* (was also known as *Acianthus reniformis*). It has round, ground-hugging leaves and a scape with two to six flowers of typical *Acianthus* shape and colours. Culture as for *Acianthus* species.

*Diuris longifolia* (now *D. corymbosa*) is called the common donkey orchid because of its two large, ear-like sepals. It is a showy plant in flower, having yellow flowers with various amounts of reddish-brown markings. Plants have two large grass-like leaves and somewhat fleshy and spaghetti-like tuberoids that should be planted on their sides. Supply basic mix, good light and ample water when in active growth. The species is an easy one to grow and benefits from yearly repotting.

*Diuris pedunculata* has pine-needle-like leaves in a basal tuft and scapes of bright yellow flowers. Its tuberoids look like tiny carrots, and they do not readily multiply. Supply good light and basic mix. This one has to be kept quite dry during its dormancy.

*Pterostylis concinna*, *P. curta*, *P. obtusa*, *P. pedunculata* and *P. curta* x *pedunculata* (natural hybrid). The "greenhoods" are beautiful little plants with flowers resembling pitcher plants. Most are all green in colour with variously long tails (sepals). All need basic mix, low to medium light and a distinct, though not severe, dormant period. All of the above species (and many other similar colony-forming species) multiply well and are easy to grow.

*Pterostylis baptistii*, *P. reflexa* and *P. nana* need the same treatment as above except that they need to be watered a little earlier in the growing season. All should be periodically checked for extreme dehydration when dormant, especially *P. nana*.

*Pterostylis decurva* needs basic mix and culture as well as early watering from mid-summer on to flower well. The plants flower after leaf rosettes die down from separate growths.

*Spiranthes sinensis* is the only Australian terrestrial orchid mentioned in this article that is also found outside Australia. It is an evergreen plant with fleshy roots, a rosette of leaves and a typical spiral inflorescence with purple flowers. It needs basic mix with extra leaf mould and, because it is found near swamps in nature, it needs to stand in a saucer of water. Pots should be flushed with water periodically to prevent salt build-up.

*Thelymitra antennifera* has beautiful, daisy-like, yellow flowers that open only on hot, sunny days. It has terete, pine-needle-like leaves out of which the flowers emerge. Give it basic mix with one extra part sand and good light. It multiplies vegetatively but slowly. It is a comparatively easy *Thelymitra* species to grow; others in the genus are reputedly very difficult. Keep it dry during dormancy.

All of the above species have been in

cultivation under lights for several years now and are all doing well under my conditions. Most flower every season. There have been some failures with species that are not included in the list above for obvious reasons.

I find that I have better success with the shady/wetter-growing plants such as *Pterostylis*, *Corybas*, *Acianthus* and *Chiloglottis* than with the sunny/drier-growing species of *Caladenia*, *Thelymitra*, *Glossodia* and the like.

In general, these species and many more similar ones are good candidates for cultivation, requiring specialised conditions, but ones that are not difficult to provide. Unfortunately, none of the Australian terrestrial orchids is widely available here in the States, primarily because of the limited interest in these plants, but also because of the false preconception that they are impossible to cultivate.

Many species can be reliably and effectively propagated by hobby or commercial growers for distribution to other interested people. This is done very successfully in Australia, thereby reducing and, in many cases, eliminating pressure on the native populations from collectors. All the plants legally sold there are propagated from cultivated plants or rescued from areas to be developed.

I hope this short account of my experiences with these orchids has been helpful to people who would like to cultivate such fascinating plants. There is much more to be learned about them, and I would welcome comments and suggestions from people interested in Australian terrestrials.

## "THE NEW ZEALAND NATIVE ORCHID GROUP COLLECTION"

If you value among your treasures some material relating to the New Zealand orchids, consider whether your heirs will value it after you have gone; if they won't, why not bequeath it to the NZNOG collection?

The core of the collection is formed by a number of books, journals, illustrations, reprints, papers and other material gathered by the convenor. It will be housed as a unit in the Museum of New Zealand Te Papa Tongarewa's Natural Environment Department (the renamed Natural History Unit) in Wellington, where it will be freely available to members of the NZNOG, and available for public study.

If you are interested in leaving reference material from your collection, contact the editor now. I will send you instructions on how to go about it, together with formletters to the NZNOG convenor, the Museum and your solicitor, and bookmarks for the material that will form your legacy.