



Journal

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Editorial

The names

Dan Hatch has made some corrections to my translations of the Latin names of species, viz. *longifolia* = long-leaved; *cryptanthus* - hidden flower.

Classification of the New Zealand orchids

What follows is based on van der Pijl and Dodson's *Orchid flowers, their pollination and evolution* (University of Miami Press, Florida, 1966: Appendix: "Synopsis of taxonomic relations of the orchids" p175 *et seq*). The classification of the orchids as it applies to the NZ species has been checked by Dan Hatch who has made some suggestions for modification and updating, and these are noted.

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Order Liliales

Family Orchidaceae

Subfamily Spiranthoideae; |
 Tribe Cranichideae {
 ("Yoania" australis somewhere here, though its position is uncertain.):
 Subtribe Spiranthinae;
 Genus *Spiranthes*;
 Subtribe Cryptostylidinae;
 Genus *Cryptostylis*;

Subfamily Orchidoideae

Tribe Diurideae
 Subtribe Caladeniinae
 Genera *Adenochilus*, *Aporostylis*, *Caladenia*, *Chiloglottis*, *Lyperanthus*,
Caleana.
 Subtribe Pterostylidinae
 Genus *Pterostylis*.
 Subtribe Acianthinae
 Genera *Acianthus*, *Corybas*, *Cyrtostylis*.
 Subtribe Diuridinae
 Genera *Calochilus*, *Orthoceras*, *Thelymitra*.
 Subtribe Prasophyllinae
 Genera *Genoplesium*, *Microtis*, *Prasophyllum*.

Subfamily Epidendroideae

Tribe Gastrodieae
 Subtribe Gastrodiinae
 Genus *Gastrodia*
 Tribe Epidendreae
 Subtribe Glomerinae
 Genus *Earina*
 Subtribe Dendrobiinae
 Genus *Dendrobium*
 Subtribe Bulbophyllinae
 Genus *Bulbophyllum*

Subfamily Vandoideae

Tribe Vandaeae
 Subtribe Sarcanthinae
 Genus *Drymoanthus*

Original Papers

Notes on native orchids in Hanmer Forest

by Brian Molloy, DSIR Land Resources, Lincoln.

Introduction

My introduction to the orchids of Hanmer Forest occurred in 1974 when I assisted the NZ Forest Service to describe the native plants at selected points along the newly-constructed Mt Isobel Walk (Molloy 1974). This information was included in a booklet on the Hanmer Forest Walks, published a year later (McCaskill and Johns 1975). Although most of this work concerned native vegetation, several visits were made to the various walks in the exotic forests. About this time the presence of native orchids in these forests was beginning to arouse attention, especially among members of the Canterbury Botanical Society who have visited the area on several occasions (e.g. Elder and Moore 1973).

The importance of the Hanmer Forest as an orchid habitat was brought into sharper focus by the discovery there of an Australian orchid, believed to be *Chiloglottis gunnii*, in November 1981 by Grant Bawden of the NZ Forest Service (Johns and Molloy 1983; Molloy and Johns 1983). This was the first record of this Australian orchid in New Zealand and it stimulated the search for this migrant elsewhere. Subsequently the same orchid was found under beech forest in the Richmond Range Forest Park in 1981 by Helen Rainforth of the Wellington Botanical Society (A.P. Druce *pers. comm.*), and under *Pinus nigra* at Iwitahi, Kaingaroa

Forest in 1985 by Lorna Grey, Tauranga Orchid Society (M. Gibbs *pers. comm.*). Until now this orchid was thought to be *Chiloglottis gunnii* Lindley, known in Australia as the common bird orchid. Extensive studies of *Chiloglottis* in Australia by David Jones have shown that there are several distinct taxa included under the name *Chiloglottis gunnii*. One of these, *C. valida* D. Jones is described as new (Jones 1991) and specimens from Hanmer, Richmond Range Forest Park and Iwitahi have been confirmed as the same species (D.L. Jones *pers. comm.* 1991). *Chiloglottis gunnii* is now considered to be a Tasmanian endemic of restricted distribution (Jones 1991). From information passed on to me by Grant Bawden, and from my own experience at Hanmer, it became clear that stands of several exotic conifers, particularly those planted in the early 1900s supported unusually large numbers of native orchids. These notes summarise information gathered on orchids at Hanmer from 1982 onwards. Not all the exotic stands have been examined and to that extent the notes are incomplete. Rather, I have concentrated on those areas where orchids have been (and in some cases still are) abundant. General distribution of orchids The distribution of native orchids within old stands of conifers at Hanmer is shown in the table:

Orchid species	<i>Larix decidua</i>	<i>Pinus nigra</i> *	<i>Pinus ponderosa</i>
<i>Gastrodia minor</i>	f	f	-
<i>G. cunninghamii</i>	f	f	-
<i>Chiloglottis cornuta</i>	o	o	ab
<i>C. valida</i>	r	-	-
<i>Pterostylis banksii</i>	-	r	-
<i>Corybas trilobus</i>	-	ab	-
<i>Microtis unifolia</i>	-	o	-
<i>Caladenia lyallii</i>	-	r	o
<i>Aporostylis bifolia</i>	-	f	o
<i>Thelymitra longifolia</i>	-	f	f
<i>Adenochilus gracilis</i>	-	-	ab
<i>Pterostylis areolata</i>	-	-	r

*No distinction is made between Austrian pine (*P. nigra ssp. austriaca*) and Corsican pine (*P. nigra ssp. laricio*) as little difference was noted in their orchid populations. Frequency of occurrence is indicated by the symbols ab = abundant, f = frequent, o = occasional, and r = rare.

The main conifers associated with native orchids at Hanmer are European larch (*Larix decidua*), Corsican and Austrian pines (*Pinus nigra*) and western yellow pine (*Pinus ponderosa*). The old larch stands (1904,1905) in the Recreation Area, which includes the well known Forest Walk, seem most suitable for the small potato orchid, *Gastrodia minor*, and the recent Australian migrant, *Chiloglottis valida*. Old stands of Corsican and Austrian pines (1907-1914) are also favoured by gastrodias, but especially by the spider orchid *Corybas trilobus*, as well

as several others. The former stands of western yellow pine (1914) in compartments 20 and 13 in the eastern part of Hanmer Forest were the prime habitat of the bird orchid, *Chiloglottis cornuta*, and the sole habitat of the slender forest orchid, *Adenochilus gracilis*, which grew in abundance. These and adjoining stands of Corsican pine in these compartments were easily the best orchid habitats at Hanmer and supported the widest range of orchids until the stands were cleared in 1990-91.

Explanation

As a habitat for forest orchids, some of the old stands of exotic conifers at Hanmer are ideal. With tree densities from 800-1100 stems/ha, these stands provide the shade, shelter and long-term stability needed for orchid establishment and reproduction. Aside from larch which is summer-green, the evergreen canopies of Corsican and Austrian pines and western yellow pine provide shade to inhibit the establishment of most competitors of orchids, while allowing enough diffuse light for orchid growth and reproduction. The regular lines and spacing of trees also provide a large uniform area of open spaces for orchids to colonise.

An even more important factor for orchids is the buildup of fungi in the litter layers associated with the continuous decomposition of fallen leaves and cones, printings, and fallen trees. Most orchids depend on fungi for seed germination, retaining this dependence throughout their lives to a greater or lesser degree. The gastrodids for example, lack chlorophyll and are entirely dependent on specific fungi. Other genera and species of terrestrial orchids with normal green leaves also have specific fungal partners, but are capable of photosynthesis. These fungi infect the roots and rhizomes of orchids as well as the swollen basal part of their stems. The fungi are digested by the orchid cells and provide a rich source of nutrients.

From her extensive studies of non-green, strongly mycorrhizal orchids, Ella Campbell has suggested that *Gastrodia cunninghamii* and *G. minor* possibly obtain nutrients from fungi ectotrophic on the roots of associated trees and are therefore epiparasites (Campbell 1962, 1963). At Hanmer however, both these

species seem confined to root-tree decomposing litter layers, especially rotting stumps and logs.

At Hanmer, different conifers produce different amounts and kinds of litter which are reflected by corresponding differences in litter and soil pH. This in turn determines the kinds of fungi present and their specific orchid partners. As far as I know, the fungi at Hanmer have not been determined systematically, but the influence of the various conifers is apparent even to the untrained eye by the regular appearance of different "mushrooms" and "toadstools" (mature fruiting bodies) following autumn and spring rains, with the larch bolete and agarics being especially plentiful.

Orchids are not the only plants affected. Other native and introduced flowering plants such as *Lagenifera pumila* and *Mycelis muralis* are associated with specific conifers. This suggests that they too may have close mycorrhizal relationships with particular fungi, or are responding to other factors such as the degree of shading or soil pH.

The climatic conditions throughout Hanmer Forest are fairly uniform, and the soils of the prevailing terraces and rolling lands are mapped as Ashwick soils, which are silt loams, and stony loams with low natural fertility. These conditions, while conducive to orchid establishment, are unlikely to play a major role in determining the local distributions of orchids at Hanmer. The conifers on the other hand are considered the major factor in this respect.

The following table summarises information on the litter, fungi, soil and pH at the various sites examined:

Conifer species		PH*	
Locality	Brief description of litter, fungi and soil	Litter Soil	
<i>Pinus ponderosa</i>			
Compartment 20	2-4cm fresh needles; 6cm dcomp. needles, cones, etc., much white and yellow fungal hyphae; over brown stony silt loam.	4.8	4.9
Compartment 13	3-4cm fresh needles; 4cm dcomp. needles, cones, etc., much while fungal hyphae; over greyish brown gritty silt loam.	4.9	5.1
<hr/>			
<i>Pinus nigra</i>			
<i>ssp. austriaca</i>			
Compartment 3	3cm fresh needles; 5cm decomp, needles, cones, etc., much white fungal hyphae; over greyish brown stony sill loam.	4.8	5.0
<hr/>			
<i>Larix decidua</i>			
Compartment 3	1-2cm fresh needles; 1-2cm dcomp. needles, cones, etc., very little white fungal hyphae; over greyish brown stony silt loam.	5.1	5.1
Compartment 4 (<i>Chiloglotiis</i> <i>valida</i> site)	1cm fresh needles; 2-3cm decomp, needles, cones, etc., very little white fungal hyphae; over greyish brown stony silt loam.	5.4	5.3
<hr/>			
<i>Pinus nigra ssp.</i>			
<i>laricio</i>			
Compartment 20	2cm fresh needles; 2-3cm decomp, needles, cones, etc., much while fungal hyphae; over brown stony silt loam.	5.8	5.4
<hr/>			
<i>Picea abies</i>			
Compartment 3	1cm fresh needles; 1-2cm dcomp. needles, wood, etc., very little yellow fungal hyphae; over greyish brown stony silt loam.	6.5	5.4

*pH was determined with a Cambridge pH meter on the decomposed and partly decomposed litter layers and the uppermost mineral soils immediately beneath

As can be seen, the deepest and most acid litter occurs under *Pinus ponderosa*, and there is a difference of almost two units of pH between the litter of this conifer and Norway spruce (*Picea abies*) where no orchids were

found. Fungi were most prevalent under *Pinus ponderosa* and the two subspecies of *P. nigra*, and least of all under European larch and Norway spruce. Not surprisingly, there was less than a unit of pH difference among the soils

immediately beneath these different litters and fungi extended into the topmost soil layers under *Pinus ponderosa* and *P. nigra* in particular. Most of the orchids' rhizomes, roots and tubers are confined to the fungal-rich litter, with a few like *Corybas trilobus* penetrating the fungal-infected soil.

Conclusion

Old stands of exotic conifers at Hanmer have proved to be some of the best habitats in the country for certain native orchids though perhaps not as rich as those at Iwitahi, Kaingaroa Forest (Gibbs 1988). Important features of these stands which have attracted orchids are: stand density (800-1000 stems/ha) inhibiting competitors on the one hand and yet permitting sufficient light for orchid establishment on the other; stand age (77-87 years) allowing an uninterrupted development of deep litter layers and a consequent buildup of the all-important mycorrhizal fungi; and the species of conifer planted which in turn determines the kind and quantity of litter, fungi and orchids present.

In terms of orchid species diversity, the conifers at Hanmer can be rated in the order *Pinus nigra* (both subspecies), *P. ponderosa* and *Larix decidua*. However, the last two are the only known habitats in Hanmer Forest of certain orchids, including the rare (for New Zealand) migrant from Australia, *Chiloglottis valida*.

Prior to felling in 1990 and 1991 the stands of *P. ponderosa* and *P. nigra* in Compartments 20 and 13 were considered the best orchid habitats in Hanmer for the number and diversity of orchids present. On the other hand, the stands of *P. nigra* and *Larix decidua* in Compartments 3 and 4 of the Recreation Area are little inferior and should be maintained as long as possible. The colony of *Chiloglottis valida* remains vigorous and healthy and continues to

expand beyond its boundaries mapped in 1982.

It seems clear to me that some of the old conifers in the Recreation Area have reached the stage where individual stands are thinning out for one reason or another creating openings for other plants to enter, thus making these new habitats less suitable for orchids. Other parts have been windthrown or felled in the past and replanted with conifer species and/or at densities less suitable for orchids. I understand that it is now planned to harvest small groups of old conifers from this area and to replant in these gaps in order to maintain this unique species planting as an amenity the public have come to enjoy.

Provided the appropriate species are replanted, and at the appropriate densities, the orchids should continue to cycle through this area. The main problems could be the susceptibility of residual stands to wind damage, and the continual ingress of undesirable plants both native and introduced. Given the right habitats, I am confident the orchids at Hanmer can look after themselves. The majority of species present are self-pollinating and self-fertilised and produce abundant seed. Some, like *Corybas trilobus*, rely less on seed production but extend vegetatively with great success.

Over the last ten years native orchids have become one of the more unusual attractions of Hanmer Forest exceeding in numbers their counterparts in the surrounding beech forests and shrublands.

With appropriate management it should be possible to maintain if not enhance this feature.

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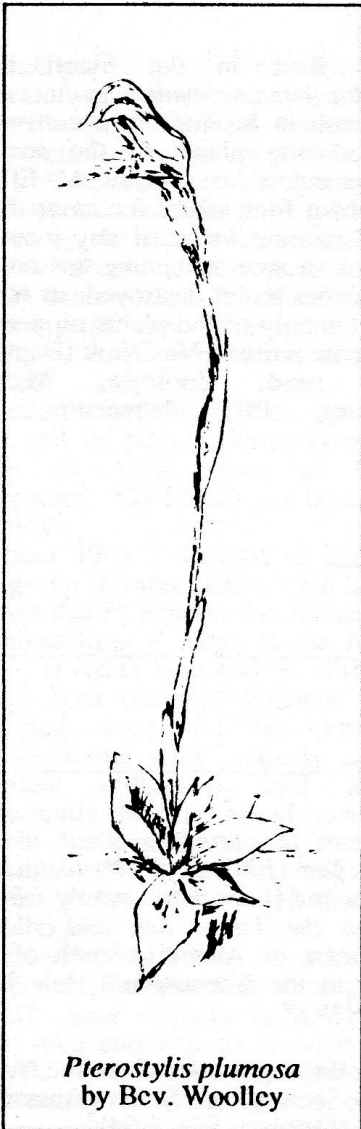
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Notes

* Dan Hatch sent an extract from "New Zealand botany with a difference - the Chatham Islands" by JW Dawson, from *Tuatara* 31: July 1991, p29: "Main Island - Nikau Forest Reserve; the *Earina* was flowering abundantly and the flowers (in January) were right for *E. mucronata*, but the leaves and stems seemed much too short for that species. The plant would match the description for *E. aestivalis*, a species which has not been accepted for some time. Some of the *Earinas* were longer stemmed than the majority and we later saw much longer specimens in southern forests also in full flower (in January 1990). So this poses something of a puzzle."

* Bev. Woolley writes (6 November), "While I was walking on a bush track 'somewhere near Whangamata' recently, a pale green rosette of leaves caught my eye. Searching around the area revealed several more plants of varying sizes, including two with flower stalks that had been broken or ripped off. A *Pterostylis*, but which one? Then I saw it - a *Pterostylis plumosa* in full plume! A beautiful dainty little orchid. Let's hope the colony of at least twelve plants can flourish undisturbed. A return visit a week later on 2 November revealed a further six plants with one showing a perfect fresh flower. The rest seemed to be seedlings: no sign of further flower buds."



Pterostylis plumosa
by Bcv. Woolley

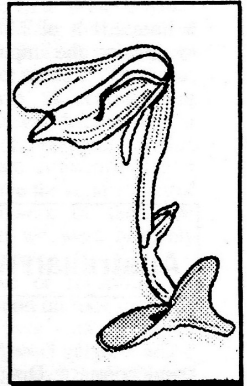
* » Dan Hatch sent the following cutting from the NZ Herald of 1 October. As he points out, the drawing appears to have been based on one by Bruce Irwin.

Rare orchid will bloom in secrecy

By KEVIN TOWNSEND

science reporter

One of the rarest orchids in the world is 'under surveillance by scientists at a secret location in the Waikato.



As the orchid is believed to bloom for only two days each October, the team of five scientists will monitor the 15 plants daily to ensure the rare event will not be missed.

The native *Corybas carsei*, shown here, was presumed extinct until found by three scientists from the Department of Conservation.

A department botanist Mr Peter de Lange, said he had spent the past several years looking for the orchid, but had little success until an expedition to the Whangamarino wetlands.

After four days of wallowing in a peat bog searching for the orchid, which stands only a few centimetres tall, the team

felt tired and demoralised. Then a miracle happened.

"We'd given up hope and we decided to have a lunch break, and we sat on it."

Despite its harsh treatment, the first specimen discovered was not harmed, and 14 more were found nearby.

Although tiny, the orchid produced a beautiful red bloom. To protect the plants, their precise location would not be revealed.

* WF Liddy writes from Napier, "I've had a couple of forays into a couple of local reserves this season, and found a couple of odd species.

"One is a winter *Pterostylis* which was flowering along with *P. alobula* and *P. trullifolia*: it has the shape of flower and leaf of *P. trullifolia*, the stem is orange-red with orange-red fusion into flower sepals and petals.

"The other is a *Cyrtostylis reniformis* which has very red flowers and stems."

* Kale Elliot of Massey University is researching the importance of the New

Zealand flora in the Maori diet. *Gastrodia cunninghamii* was included by Colenso in his list of 'uncultivated food-producing plants of the ancient New Zealanders' last century. Ms Elliott needs about four tubers for an analysis of their nutrient value: if any member knows of an area containing this orchid that is either to be destroyed, or has a plentiful supply of the plants on private land, please write to Ms Elliott (Depts of Botany and Zoology, Massey University, PB, Palmerston N.)

Australian Notes

* The Dingley Fern Market (233 Centre Dandenong Rd, Dingley, Vic. 3172) has struck a 1991 orchid collectors' badge, at ASS posted. They also have a limited number of Zimbabwe Orchid Society badges at A\$6 posted.

* Where is Australasia? A motion submitted to the ANOS AGM from its Warringah Group (*Monthly Bulletin* August 1991) seeks to change the Rules so that the term would include the islands east of the Wallace Line. The paragraph would read (changes italicised) "By Australasian is meant the Commonwealth of Australia and all its Territories, together with New Zealand, New Caledonia, Vanuatu, Fiji, Papua New Guinea including the Bismarck Archipelago, Solomon Islands, West Irian and the islands east of the Wallace

Line from the Lombok Strait to the Celebes Sea (120° E, 3° N) to include Sulawesi and Halmahera and the islands south to the Timor Sea and all the islands east of Australia south of the equator to the International Date Line (or 165° W)."

* The following is taken from the Native Orchid Society of South Australia's *Journal* (October 1991, p 94):

Pterostylis nana: species or subgenus?

by R. Bates

Only ten years ago the name *Pterostylis nana* was applied to every one of the little greenhoods which have an indexed tooth in the sinus of their conjoined lateral sepals. Since then we have gradually seen species being split off. *P. dilatata* was described as a species from

Western Australia with cauline leaves not rosette leaves like most of the others. *P. pyramidalis* was recognised as a W.A. species from swampy ground with leaves up the stem - broad at the base, narrow above. Nevertheless it was easily demonstrated that there were still as many different forms as there were habitats. *P. nana* occurred in swamps, coastal sandhills, forest, heath, mountains and desert rock outcrops in rich soil or poor. Some flowered as early as April, some as late as December. Could they all be the same species?

About 1985 I decided to investigate the group in more detail. We had long known that *P. nana* in the mallee looked different from *P. nana* in the Adelaide hills. It didn't take long to find places where both occurred together and, as expected, they did not interbreed. What's more, they actually attracted different pollinators and just as importantly the little round bodied flies which pollinated both were only distantly related to the long bodied fungus gnats which visited most other greenhoods!

Research in South Australia soon showed that as many as three different *P. aff. nana* actually occurred in the same area and that these were habitat specific. It was soon clear that at least four totally different species occurred commonly in S.A., i.e. "Hills nana" (with white hairs on the scape); "Mallee nana" (with tiny laterally compressed flowers and round leaves on long petioles); "Coastal nana" (with crenulate leaves and large, brown lipped flowers) and "Veined nana" (with blue green sagittate leaves distinguished by their prominent veins - the flower being reticulate veined and turning red with age). Each is pollinated by a different fly!

Further research showed that each of these could be divided into races or subspecies. "Hills nana" has a lookalike cousin found in the semi-desert areas, the differences are not as obvious as between the four species and work on their pollinators hasn't given clearcut results but biologically the two require different habitats and the desert ones don't last long in cultivation!

In 1986 when the first "Veined nana" were collected at Hale Conservation Park in the Adelaide Hills they were thought to be a relict species. This year, however, on a trip to central Eyre Peninsula in July, it was discovered that "Veined nana" were common in that area - but there were differences (for a start they did not have the rigid leaves or short stemmed flowers of the Hale specimens). Again we were probably looking at two subspecies.

Then a third race or subspecies of "Hills nana" was found on rock outcrops overlooking the sea on Fleurieu Peninsula and Kangaroo Island. These had fleshy narrow leaves and pinched flowers.

Hybrids are common between most of the *Pterostylis* sp. but none of the *P. nana* complex are known to cross with species of any other complex. Add this to the quite different suite of pollinators; the constant nature of several morphological features and the remarkable diversity of species to suit different habitats and you will see that what was once regarded as a single species, then a species complex, might now be regarded as a subgenus!

In Western Australia in 1990 I found no less than 20 different kinds of "*P. nana*". Many of them highly localised, i.e. one grew only in the Porongurups, another only around Lake Muir, so *P. nana* is not even a small subgenus.

I have no doubt that there is enough work to be done yet to last many years as we try to unravel the relationships between the different taxa - which are true species, which are only races? How specific are the pollinators?

* In the Wollongong Group's *Bulletin* of July 1991 is advice on collecting orchid seed. A table lists times from pollination to pod maturity (e.g. *Bulbophyllums* 100-180 days, *Dendrobiums* 60-280 days, *Caladenia catenata* 34 days, *Pterostylis curta* 60 days). Harald Geppert writes, "...many factors such as temperature, humidity,

fertiliser usage all affect pod maturity.... There are often signs that a pod is getting ready to split, e.g. the pod will change colour from green to yellow, or the seams of the pod will change colour. Sometimes the pod seems to expand another fold.... place an empty tea bag over the pod (try to keep it dry). Don't use a plastic bag as this will cause the pod to sweat and... the seed may be ruined. Keep the seed dry at all times; once the pod starts splitting, place the seed in a paper envelope.... plastic and greaseproof are no good to store seed in, even for a short time.... Scaled green pods rot too."

Mapping

A further \$500 has been granted to the Group's Mapping Scheme by the Lottery Grants Board, and we are very grateful for this support.

1992 is the last year of the Mapping Scheme, so we have only two seasons in which to complete the work. There are a number of Ecological Regions from which we have had few if any reports. If you have seen orchids in the following areas (or in any other not reported in previous issues of the *Journal*) since 1982 please write to the editor.

1 Kermadec:

2 Three Kings:

7 Poor Knights:

14 Whakatane: *Bulbophyllum tuberculatum*, *Drymoanthus adversus*, *Pterostylis graminea*, *Thelymitra longifolia*.

15 Western Volcanic Plateau: *Corybas trilobus*,

Dendrobium cunninghamii, *Earina autumnalis*, *li. mucronata*, *Gastrodia minor*, *Prasophyllum "aff. patens"*.

19 Raukumara: *Earina autumnalis*, *E. mucronata*, *Microtis parviflora*, *Pterostylis graminea*.

23 King Country: *C. macranthus*, *Corybas "A"*,

26 Maowhango:

27 Kaimanawa: *Caladenia catenata*, *Chiloglottis cornuta*, *Corybas trilobus*, *Earina mucronata*, *Prasophyllum colensoi*, *Pterostylis banksii*, *P. patens*, *Thelymitra cyanea*, *T. longifolia*.

30 Rangitikei: *Chiloglottis cornuta*, *Corybas macranthus*, *C. trilobus*, *Corybas "A"*, *Corybas "short tepals"*, *Prasophyllum colensoi*, *Pterostylis australis*, *P. banksii*, *P. aff. montana*, *Thelymitra longifolia*.

31 Manawatu: *Corybas trilobus*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Gastrodia cunninghamii*, *G. minor*, *G. sesamoides*, *Microtis unifolia*, *Orthoceras novae-zeelandiae*, *Pterostylis graminea*, *Thelymitra longifolia*.

32 Manawatu Gorge:

- 33 Pahiatua: *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Thelymitra longifolia*,
 34 Eastern Hawke's Bay: *Pterostylis trullifolia*
 35 Eastern Wairarapa:
 36 Wairarapa: *Acianthus sinclairii*, *Corybas macranthus*, *C. trilobus*, *Dendrobium cunninghamii*, *Drymoanthus adversus*, *Earina autumnalis*, *E. mucronata*, *Microtis unifolia*, *Pterostylis banksii*, *P. graminea*, *Thelymitra longifolia*.
 37 Aorangi:
 41 Wairau: *Corybas rivularis*, *Dendrobium cunninghamii*, *Earina autumnalis*, *E. mucronata*, *Gastrodia sesamoides*, *Orthoceras novae-zeelandiae*.
 42 Inland Marlborough:
 43 Molesworth: *Earina mucronata*,
 44 Clarence:
 45 Kaikoura: *Drymoanthus adversus*
 52 Lowry: *Chiloglottis cornuta*, *Chiloglottis gunnii*.
 53 Hawdon: *Acianthus viridis*, *Aporostylis bifolia*, *Caladenia lyallii*, *Chiloglottis cornuta*, *Corybas rivularis*, *C. trilobus*, *Lyperanthus antarcticus*, *Pterostylis graminea*, *P. montana*, *P. oliveri*, *Thelymitra hatchii*.
 54 Puketeraki: *Chiloglottis cornuta*, *Corybas trilobus*, *Pterostylis oliveri*.
 56 Canterbury Plains: *Pterostylis tristis*, *P. "aff. cynocephala"*, *Thelymitra hatchii*, *T. longifolia*, *T. pauciflora*.
 57 Banks: *Gastrodia cunninghamii*.
 58 D'Archaic: *Caladenia lyallii*, *Corybas rivularis*, *Gastrodia cunninghamii*, *Prasophyllum colensoi*, *Pterostylis "aff montana"*, *Thelymitra hatchii*, *T. longifolia*.
 59 Heron:
 60 Tasman: *Caladenia lyallii*.
 61 Pareora:
 62 Wainomo:
 63 MacKenzie: *Prasophyllum colensoi*.
 64 Waitaki:
 67 Central Otago: *Lyperanthus antarcticus*, *Pterostylis "aff. cynocephala"*.
 68 Lammerlaw: *Adenochilus gracilis*, *Aporostylis bifolia*, *Caladenia lyallii*, *Chiloglottis cornuta*, *Corybas macranthus*, *C. rivularis*, *C. trilobus*, *Gastrodia minor*, *Prasophyllum colensoi*, *Thelymitra pauciflora*.
 71 Olivine: *Corybas acuminatus*, *Pterostylis australis*, *Spiranthes sinensis*, *Thelymitra longifolia*.
 74 Waikaia:
 75 Gore:
 76 Southland Hills: *Corybas Iridous*, *Thelymitra pauciflora*.
 81 Bounty:
 82 Antipodes:
 84 Campbell: *Aporostylis bifolia*, *Chiloglottis cornuta*, *Corybas trilobus*, *Lyperanthus antarcticus*
 85 Macquarie: *Corybas macranthus*

GIVE THE CONSERVATION MESSAGE THIS CHRISTMAS

The New Zealand orchids: natural history and cultivation

Give this beautiful book for Christmas, and help promote our wild orchids: send your Christmas card, the address you want it sent to, and your cheque (to "NZNOG") for \$16 for each copy (the special Members' discounted price) to

E.D. Hatch, 25 Tane Rd, Laingholm, Auckland.

Historical reprints

Elizabeth Johnson

In 1950 Marguerite Maud Johnson used the pseudonym "Rewa Glenn" when her book *Botanical explorers of New Zealand* was published by Reed in Wellington. The material for the book was originally written as a series of radio talks for the New Zealand Broadcasting Commission, and the cover flap stated "With two colour plates by Margaret Johnson..."

One of the colour plates is labelled, "The orchid that interested Cheeseman and Darwin - these species are from Mt Egmont"; it is the greenhood *Pterostylis patens*, then regarded as a variety of *Pterostylis banksii*.¹

In fact the illustrations were drawn by her sister, Elizabeth Johnson.

Elizabeth Johnson also provided the line drawings for a series on the New Zealand flora first published in the *New Zealand Gardener* in the nineteen-fifties (see Figures 1-3). "Rewa Glenn" wrote (in a style lavishly sugared with adjectives and similes) about finding *Corybas macranthus*:

"We discovered large patches in thick bush high up on a hillside where a spring oozed out from a mossy stony grotto. The fleshy leaves, moist with sap, glistened on the under surface like silvered shot silk while the dark green of

the upper surface was daintily bordered and centred with russet spots. Here and there the quaint purple red helmets shone out while the elongated filiform sepals, like insects' antennae, curved above. One got glints of silver amongst the russet and green intermixed with purple and crimson."²

In 1968 nearly 200 of these illustrations were reproduced in New Zealand flowering plants, another book by Marguerite Johnson, dedicated "To the Memory of My Sister Elizabeth".

The woodcuts (one is *Pterostylis patens*) for her booklet *A holiday idyll* (1964) are also Elizabeth Johnson's work.³

References

1. Glenn, Rewa (pseudonym of Marguerite Maud Johnson). *The botanical explorers of New Zealand*. Wellington, A.H. and A.W. Reed, 1950. Opposite p 80.
2. Glenn, Rewa. New Zealand orchids - species found at Queen Charlotte Sound. *New Zealand Gardener* 1954. 1: 222-4.
3. Johnson, M.M. *New Zealand flowering plants*. Christchurch, Caxton, 1968.



Figure 1: "New Zealand orchids" (*Cyrtostylis oblonga*, *Caladenia minor*, *Pterostylis plumosa*, *Acianthus sinclairii*, *Pterostylis banksii*, *Pterostylis graminea*, *Corybas macranthus*, *Pterostylis trullifolia*), line drawing by Elizabeth Johnson, from *New Zealand Gardener* 1984, November 1: p222



Figure 2: "Orchids from Queen Charlotte Sound" (*Gastrodia cunninghamii*, *Earina autumnalis*, *Dendrobium cunninghamii*, *Thelymitra cyanea*, *Orthoceras novae-zeelandiae*), line drawing by Elizabeth Johnson, from *New Zealand Gardener* 1954, December 1: p294..



Figure 3: Two species of *Pterostylis* from Mount Egmont" (*Pterostylis patens* and *P. venosa*), line drawing by Elizabeth Johnson, from *New Zealand Gardener* 1959, February 1: p36

PHOTOGRAPHIC COMPETITION

Gordon Watson of Invercargill has agreed to organise a photographic competition for NZNOG members.

There will be two sections - prints and slides.

Class A: a set of six different species.

Class B: single photograph of a *Thelymitra*.

Class C: single photograph of a *Pterostylis*.

Class D: single photograph of a *Corybas*.

Entry forms will be available later.

Entries will close on 2 May 1992.

Prepare now, and watch this space.

The Proceedings

of the 1st Australasian Native Orchid Conference held at the University of Wollongong: available at SA35 (includes post and packing) from

Bob Napier, Hon. Treasurer ANOS, 12 Laguna St, Caringbah 2229, Australia.

Soon to be published

Wild orchids in the far south of New Zealand:

Otago, Southland and Stewart Island species

The Australian Orchid Foundation

has available the following publications:

Australian Orchid Research Volume 1 (Catalogue of Australian Orchidaceae) and Volume 2 (108 new taxa - see B.Molloy's review in *NZNOG Journal* 39)

R. Schlechter's *Orchidaceae of German New Guinea* in English translation, as well as a number of reprints of Schlechter's papers on orchids.

J.J. Smith's *The orchids of Dutch New Guinea and his New Papuan orchids*.

J. van Bodegom's *Some orchids of West New Guinea*.

A number of orchid books from the Royal Botanic Gardens, Kew, and a number of "short papers" on Australian orchids are also available

Write to 107 Roberts St, Essendon, Victoria 3040 for details.

Second Australasian Native Orchid Conference

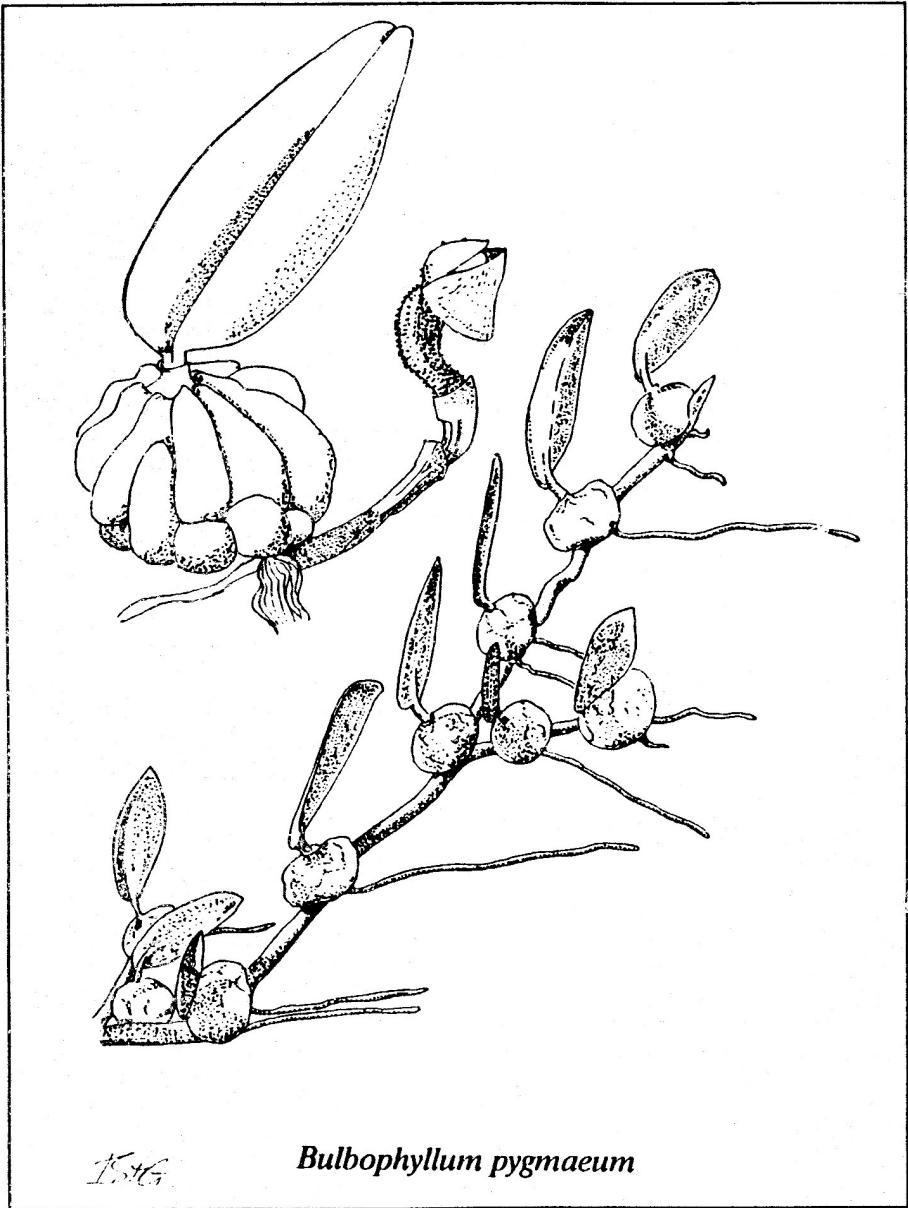
Toowoomba, Queensland, 17-19 September 1993

The Second Australasian Native Orchid Conference, sponsored by the Council of the Australasian Native Orchid Society (ANOS), and hosted by the Native Orchid Society of Toowoomba Inc. will be held at the University of Southern Queensland from 17-19 September 1993.

The Conference will include a show of native orchids and will overlap with the renowned Toowoomba Carnival of Flowers, to take place from 18-26 September 1993. The organisers propose to hold two lecture sessions presented by knowledgeable speakers, one devoted to success stories in the conservation of native orchids, the other devoted to matters of a general nature.

People interested in attending should contact

Hon. Secretary, NOSTI, POB 2141, Toowoomba, Queensland 4350, Australia



K. S. G.

Bulbophyllum pygmaeum