Journal

ISSN 1170-4543

Number 44,
December 1992.

Editor: Ian St George, 22 Orchard St, Wadestown, Wellington: (04) 4994227.
ANOS liaison: Brian Molloy, Landcare Research NZ Ltd, POB 69 Lincoln, Canterbury.
ANOS Council contact: Michael Harrison, 68 Howes Rd, North Wilberforce, NSW 2756, Australia.

Contents

Editorials
1. NZ native orchid artists:
   - Frank Blackwell (1862-1934)
4. A glimpse of Aussie *Caladenias*

Original papers
6. Conservation of the NZ orchids by Brian Molloy
9. The Maori and the orchid by Ian St George
11. Further observations on *Corybas* by Bruce Irwin

Notes
14. Steve Savage, Nelson
    Barbara McGann, Oamaru
    Dan Hatch on *Thelymitra cyanea*
    Errors in the last issue

Conservation comment
17. Threatened orchids

Australian notes
17 Jim Lykos

Mapping scheme
18 Progress report

Historical reprint
22 James Cook on NZ insects

Christmas offer
24 NZNOG publications

Editorials

New Zealand native orchid artists

This issue continues the series on artists who have illustrated the New Zealand orchids, begun with Sydney Parkinson in 1986 in the Orchid Council's publication *Orchids in New Zealand*, and continued to 1989.

Frank Blackwell (1862-1934)

After a bout of rheumatic fever Frank Blackwell was told he would not survive the English winters. At nineteen he therefore emigrated to New Zealand with his brother. His father was wealthy. With his help the brothers bought a farm on the Kaipara.

He was the first New Zealand botanical photographer to be published: he made the plates for the New Zealand classic, Laing and Blackwell's *New Zealand plants* (1906).

When his sister Ellen met Robert Laing on the voyage to New Zealand in 1904, a successful botanical literary collaboration was begun. For though it is Laing who has received much of the recognition for their work, it was Ellen Blackwell, the amateur botanist, who set out to produce a book that would fire

the public with enthusiasm. When it was published, it contained "160 Original Photographs by E.W. and F.B. Blackwell". Seven other photographers contributed - and *Earina autumnalis* was printed upside-down.

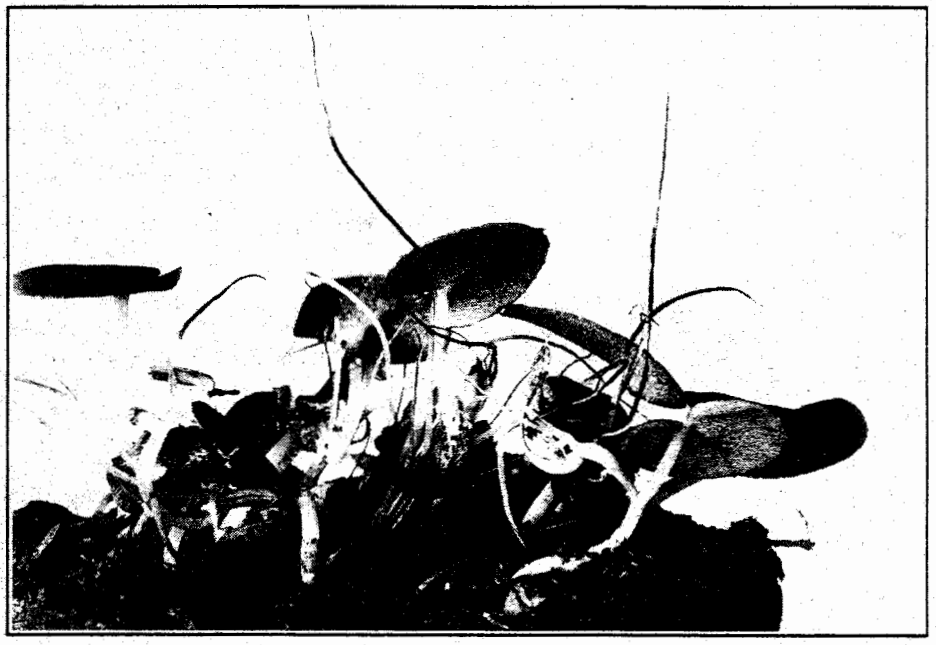


Figure 7: *Corybas macranthus*, monochrome photograph by Frank Blackwell *c.*1904. Printed from a glass negative courtesy of the Auckland Institute and Museum.

The text is not straight botany - the excitement and flair of the amateur often divert the reader into interpretations that are more art than science; the descriptions give us strong flavours of Maori and Pakeha life at the turn of the century. Dick Scott wrote -

> "The Blackwells made a massive contribution to *Plants of New Zealand*. Ellen's hand was present in both the descriptive and scientific text through the book...."[1]

Despite this, Laing has been accorded almost all the credit for the work, with the hint that some romantic attraction to Ellen compelled him falsely to attribute co-authorship to her. This nonsense is finally and convincingly put to rest by Dick Scott in his excellent *Seven lives on salt river*.

Frank Blackwell's photographic credits were dropped from later editions (it went to eight) of Laing and Blackwell. Among his glass negatives that have survived are those of *Pterostylis banksii* and *Corybas macranthus*, by all appearances taken on the same day as the photographs used in the book.

What of photography in botanical art? What the camera can do faithfully is to reproduce the image of the plant. What it cannot do (and what the botanical painter can) is to create from a series of plants of one species an explanatory picture, one that emphasises the features that make a particular species unique.

Norris K. Smith has stated -

> "I find the notion ineradicably fixed in my students' minds that a well focused camera reveals to us the truth about things - what my very worst students refer to as `reality as it really is'.... The camera is widely thought to `see' with impartial accuracy, but in fact cannot see at all; for seeing is not a matter of optical mechanics; it is rather a process that involves our whole mental and spiritual being."[2]

These early botanical photographs must have seemed the perfect way of truly depicting a species. But they lack the explanatory power, and certainly the beauty, of good botanical drawings. Frank Blackwell's *Corysanthes macrantha* looks unnatural, posed: the pot perhaps too recently and too vigorously weeded.

Frank was a true generalist. He farmed, built boats and a huge wharf, dug gum, gathered cocksfoot, and maintained the local launches. He was a talented amateur botanist and he loved photography: he spent days in his darkroom producing postcards of local scenes. His father died leaving Frank wealthy, and in 1900 he married Nan Browne, sister of the Pahi postmistress; they were to have five children. He built a maypole, a three-storeyed dolls' house, water sleds for aquaplaning, furniture from native woods, kaleidoscopes. Where the Blackwell house once stood there are now great trees -

> "Californian redwoods... two rare pecan nut trees... an Australian silky oak and a Japanese camphor tree... English oak... a grove of big-stemmed bamboo... red-flowered mallow, wild or cultivated olive, false acacia, escallonia, and the Chinese trumpet vine... wistaria... puriri and rimu and other natives and at its edge two cabbage trees support enormous collars of staghorn.
>
> "Of all the forgotten gardens that ring the Kaipara, Blackwell's is the most impressive. It deserves to become a place of pilgrimage."[3]

References

1. Scott, Dick. *Seven lives on salt river*. Auckland, Hodder & Stoughton, 1987. p 116.
2. Smith N.K. Quoted by G.Gayle Stephens *in* Kerr White E. *The task of medicine*. Menlo Park, Henry J. Kaiser Family Foundation, 1988. p 176.
3. Scott, p 123.

Native orchid weekend 1992

Iwitahi Outdoor Education Trust camp, State Highway 5 (Taupo-Napier highway),
12-13 December
contact Ken Scott, 80 Taharepa Rd, Taupo before 1 December.

A glimpse of Aussie *Caladenias*

Labour Weekend saw us in Melbourne, and I took the opportunity to go out with NZNOG and ANOS Victorian Group members Malcolm and Beverley Thomas who know the local orchids well (see Doug McCrae's accounts in NZNOG *Newsletters* 30-33). We saw in a number of sites in eucalypt scrub near Anglesea some of the species that I had previously seen only in illustrations: three *Diuris* species, *Glossodia major, Caleana major, Acianthus, Thelymitra* and *Pterostylis* species altogether different from ours, *Lyperanthus nigricans,* and a single *Prasophyllum.*

What impressed me were the large size and number, and the vividness of all the wildflowers, and especially the orchids: clearly the big difference is insect pollination, which also explains the frequency of orchid hybrids.

Among the most striking were the *Caladenias.* Clements listed 104 Australian *Caladenia* species[1], and Jones added 31 new ones.[2] There are in addition several recognised varieties and hybrids. Jones divided them into small-flowered (fairy orchids, lady's fingers) and large-flowered species (spider orchids).[3]

I saw a few small-flowered species - *Cc. pygmaea, menziesii, parva, fuscata, valida, iridescens* - but the large-flowered spider orchids were extraordinary.

Robust plants, leaf and stem grey as a lamb's ear with hairs, the flowers up to 10cm across, and from white and cream to strong reds and greens.

The first we found was *C. dilatata,* on the road verge, 30cm high, the flower green and crimson, 6cm across, with greatly elongated filiform sepals and petals, the labellum maroon-tipped, toothed at its edges, bearing four rows of dark calli, hinged at its base and mobile in the wind. Soon the smaller *C. cardiochila,* with its untoothed, heart-shaped labellum; later the large, mostly white *C. venustra*; a *C. dilatata X C. venustra* hybrid; *C. clavigera, C. reticulata,* and a *C. reticulata X C. dilatata* hybrid.

Malcolm Thomas said this is the best season since the Ash Wednesday fires of 1983.

The big Australian *Caladenias* are impressive orchids: they are very colourful, and they are remarkably mobile. It is difficult to convey those qualities in writing, or even in drawings or photographs. If you ever have a chance, go and see them for yourself.

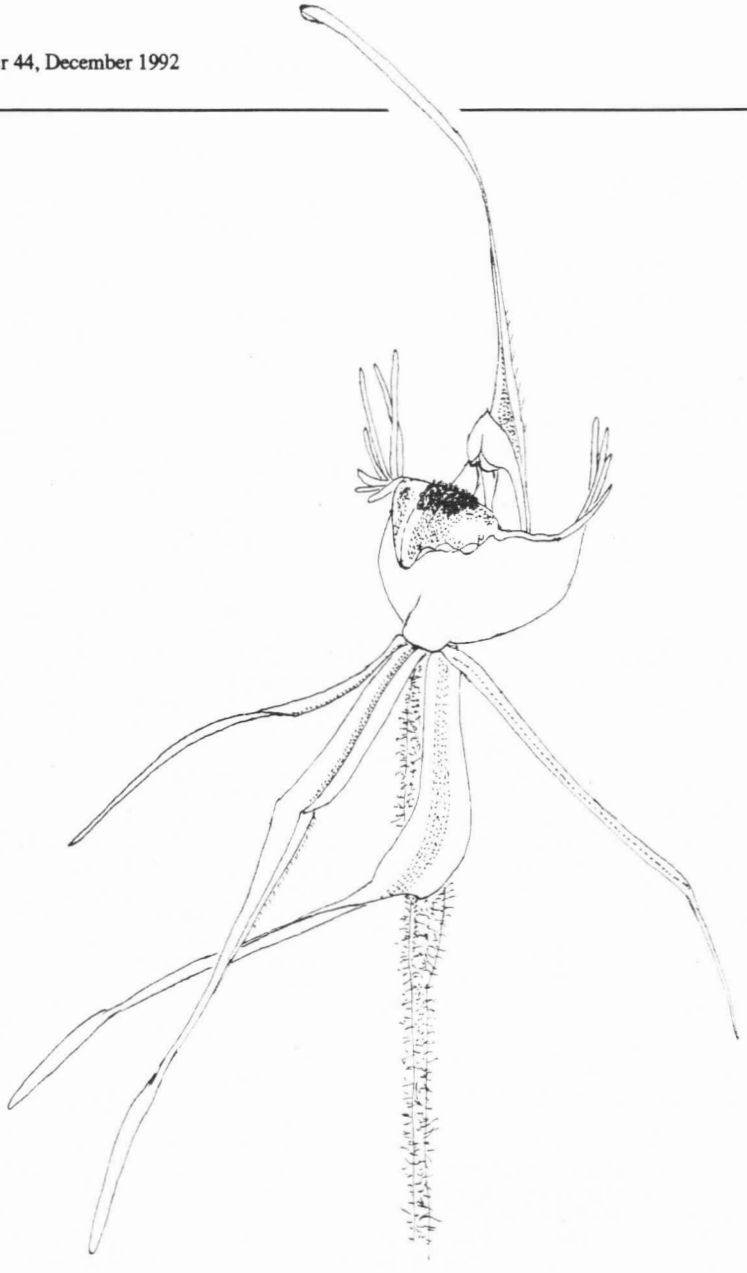
(My sincere thanks to Bev and Malcolm Thomas for their hospitality)

References

1. Clements M.A. Catalogue of the Australian Orchidaceae. *Australian Orchid Research* 1989. 1.
2. Jones D.L. New taxa of Australian Orchidaceae. *Australian Orchid Research* 1991. 2.
3. Jones D.L. *Native orchids of Australia.* Reed books, French's Forest, 1988.

Second Australasian Native Orchid Conference and Show, Toowoomba, Queensland, 17-19 September 1993.

A second update on arrangements for this event, and a set of rules for plant exhibitors, are available from the NZNOG Editor.



Caladenia dilatata: near Anglesea, Victoria; about twice natural size

Original papers

Conservation of New Zealand orchids

by Brian Molloy, Christchurch

(reprinted from The Orchadian 1992. 10 (7): 249-251, with the author's permission)

INTRODUCTION

New Zealand has a small orchid flora of about 100 species spread over 23 currently accepted genera. In this flora there are very few epiphytes, only eight species representing four genera. On the other hand, the terrestrial element is well represented by about 92 taxa, including five leafless, non-green saprophytes, four in the widespread genus *Gastrodia*.

At least 20 taxa are unnamed or of uncertain status, and several others have been assigned to the wrong genus and probably represent monotypic endemic genera. About 66 taxa are currently believed to be endemic, with the rest shared mainly with Australia. Twenty-two taxa are listed as threatened plants. The names and status of all these orchids are currently being reviewed.

DISTRIBUTION AND PRINCIPAL HABITATS

The native orchids of New Zealand are spread thinly throughout the main islands and offshore and outlying ones from the subtropical Kermadec Islands in the north, where two species occur on Raoul Island, to the subantarctic islands in the south. These southern outlying islands show an interesting relationship with their source area of orchids, namely, the main islands of New Zealand. The Chatham Islands, the largest of the outlying islands, and situated directly in the path of the prevailing westerly winds, support the greatest number of orchids, 26 species, including four epiphytes. The numbers of orchids on the subantarctic islands in the south are in direct proportion to their distance from the South Island, their size, and the availability of suitable habitats. For example, the Auckland Islands have 12 species, while the smaller and more distant Campbell Island has only six. Of the main islands of New Zealand, the warmer North Island contains the largest representation of species.

These native orchids occur in a variety of forest, scrub, grassland, wetland and other habitats from the coast to above the climatic treeline, which in New Zealand ranges from about 1500 m at its maximum down to about 600 m in the south. The alpine zone above this treeline supports at least 15 species, with one ascending to 1700 m. These orchids occupy a range of rock, scrub and herbfield habitats. The forested and former-forested lower altitudinal zones support the largest numbers of orchids. Among the forest types, those of mixed conifer/hardwood composition are the richest in orchids, including most of the epiphytes. Several orchids are confined to a subtype of these forests dominated by Kauri, *Agathis australis*. Beech forests, dominated by *Nothofagus* spp. are less orchid-rich, but nonetheless are important orchid habitats.

Shrublands of mixed species, but especially those dominated by *Leptospermum* and *Kunzea*, are some of our best orchid habitats. Natural or induced tussock grasslands carry an orchid flora of around 28 species, while our diminishing sedge/rush wetlands are the habitats of a small select group of about 11 species.

New Zealand orchids occur under a range of soil and climatic conditions with particular concentrations in the warmer far north, in central and southern North Island, and in the warmer top part of the South Island. Some of these choice sites are on old infertile soils, but others are mantled by much younger ones. A common feature of them all, however, is the low nutrient-supplying power of the parent materials, which gives rise to fungal-rich, infertile, often poorly drained soils. Disturbance of the vegetation on these sites usually leads to an abundance of terrestrial orchids.

Old plantations of exotic pines, especially *Pinus nigra* and *P. ponderosa*, with their rich fungal floras, are amazing habitats for terrestrial orchids, given adequate light conditions and lack of competition from herbs, ferns and shrubs. Up to 30 or 40 species may be found in these planta-

tions in numbers seldom if ever seen in native vegetation.

EXISTING NETWORK OF PROTECTED AREAS

New Zealand's protected area network, administered by the Department of Conservation, now approaches 2,400 individual areas embracing over 5 million hectares or 20% of the total land surface. These areas range in size from pocket-handkerchief relics of "natural" vegetation surrounded by developed farmland, to large national parks and forest parks covering a wide range of altitudes and landscapes in the undeveloped and largely uninhabited hills and mountains. This Crown or State network is expanding, with more candidates for large park or smaller reserve status being promoted. In addition, the Department of Conservation, the sole State agency for protection and conservation advocacy, is responsible for managing other stewardship areas and the subantarctic islands, bringing the total area under its control to 30% of New Zealand's land area.

Another rapidly expanding network of protected areas are the covenants registered by private landholders with the Queensland Elizabeth the Second National Trust. This Trust, established by Statute in 1977, promotes and protects natural landscape features on privately owned and leasehold land by means of an open space covenant, by purchase, or by ownership through gifts. Through its covenants, the National Trust acts as perpetual trustee for features it protects, while the land itself remains in private hands. At present the Trust has registered some 430 covenants, covering about 10,300 hectares of forest, scrub, wetlands and grasslands. There are a further 350 covenants under action embracing an even greater area of about 60,000 hectares, including valuable landscapes and vegetation on Maori-owned land, and whole-of-title high country sheep runs on Crown leasehold.

ORCHID COMPONENT OF PROTECTED AREAS

The orchid component of these protected areas is probably considerable but needs collating. This in itself would be quite a task and probably not achievable in the immediate future. The vegetation and flora of many of these areas are reasonably well known, but few accounts have been published. There are other areas where the flora is less well known. In all cases the orchid flora is probably underestimated as most of the information is based on summer field surveys. The native orchid flora is dominated by deciduous terrestrials which appear above ground throughout the year depending on the species, and at least four visits to each area at different times of the year are essential. In addition, some of our perching orchids are high epiphytes in the tops of tall trees and can easily be missed. One thing is certain, there would hardly be a single protected area that did not support at least one orchid species.

ORCHID COMPONENT OF UNPROTECTED AREAS

The landscape of New Zealand can be split almost three ways: about one third could be classed as "natural", where little or no change has taken place in historical times other than by natural means; about another third has been almost completely transformed by agriculture, horticulture, forestry and urban development; and the remaining one third could be classed as "semi-natural" where habitat disturbance of one kind or another continues to operate. Not surprisingly, these semi-natural landscapes support considerable numbers of orchids and pose a conservation challenge. Many of these areas lie between the highly developed and intensely populated lowlands on the one hand, and the largely non-productive hills and mountains which contain our largest protected natural areas. Apart from remnant tall forests and enclaves of other plant communities, secondary vegetation of shrublands and low forest prevails. There is a tendency to protect the tall forest remnants in these areas and to neglect the important, orchid-rich shrublands and allied communities.

NEW MEASURES FOR HABITAT PROTECTION

New measures for habitat protection have the potential to expand the existing protected area network and bring about a greater representation of important orchid habitats. The government supported Protected Natural Areas Programme is one of the corporate objectives of the Department of Conservation, with the aim of protecting representative examples of New Zealand's ecological diversity on land of all tenure. This programme is effected through survey and identification of areas requiring specific protection and the implementation of appropriate protective measures. Surveys are based on ecological districts which were drawn up by multidisciplinary teams of regional

experts. So far most of the effort has gone into survey work, and very little implementation has occurred. There are various political, social and economic reasons for this.

The new Government policy on indigenous forests prevents the future harvesting of native timbers on all land, whether privately- or Crown-owned, except on a sustainable yield basis. This policy includes a $6.75 million per year Trust Fund for the protection of indigenous forests of high ecological value. Although this policy has generated intense debate, especially among private landholders, it will certainly prevent further loss of native forests. This move alone will benefit orchids immediately throughout the country, especially the epiphytes.

Although it now seems somewhat unnecessary, the proposal for a new national park to include discontinuous areas of our special Kauri forest remnants in northern New Zealand is commendable. As already noted, these particular forests are home to a select band of orchid species as well as some of the more common ones.

RARE AND ENDANGERED ORCHIDS

New Zealand is well served by the efforts of individuals and organisations to publicise and protect its endangered plants and animals. There are several readable books on the subject in which orchids feature prominently, and within the Department of Conservation there is an increasing awareness of the conservation needs of endangered orchids. However, while considerable progress has been made in protecting and enhancing our endangered fauna, little of note has been achieved with endangered plants. There is an urgent need to raise the whole profile of plant protection. But it is not easy to arouse public support over a plant compared to a rare parrot or marine mammal.

With so much publicity and attention being given to our endangered fauna and flora these days, the common-place elements often tend to be ignored and overlooked. There is a strong case to redress this imbalance if we wish to protect representative examples of our natural systems.

It is timely also to assess critically the relative merits of conserving endangered endemic orchids as opposed to those few species that continually arrive from Australia and became extinct again, or barely obtain a toe-hold. Most of our endangered orchids belong to the latter category.

MANAGEMENT REQUIREMENTS

For many orchids in existing protected areas, there is little, if any, requirement for intervention management. But the continued presence of others, especially those attuned to habitat disturbance, will depend on our ability to manipulate different habitats and make them more favourable. Such manipulation or intervention management will often be in direct conflict with the retention of other natural values. Many of our native orchids do not lend themselves readily to enrichment programmes, or cultivation in botanic gardens, and habitat retention and management seem to be the most desirable strategies.

It has been said that provided there is sufficient habitat, New Zealand's native orchids can look after themselves. In general I am inclined to agree, especially with respect to those orchids secured within protected areas in our mountains and on our offshore and outlying islands. However, in the one third of New Zealand classed as semi-natural, intervention management will become increasingly more important, especially in those protected wetland and dryland systems now reverting to rank growths of inhospitable gorse, *Hakea* and other exotic shrubs and tall herbs.

FUTURE NEEDS

The description and classification of New Zealand orchids is still far from complete and needs to be addressed. Likewise, we need to know more about the whereabouts of all orchid species, in both protected and unprotected areas. The mapping scheme promoted by the New Zealand Native Orchid Group should go a long way towards meeting this requirement. There is also still much to learn about individual orchids and their lifestyles. We know a little about their pollination and breeding systems, but very little about their ecology and almost nothing about their population dynamics, hardly a sound basis for an informed species conservation strategy. On the other hand, we do know that orchids are favoured by particular habitats. There is a need to identify the key features of these habitats so that sound management practices can be put in place. Habitats and orchids at risk also need to be identified and appropriate protective and management measures taken. The New Zealand Native Orchid Group is addressing these issues in collaboration with the Department of Conservation and the scientific community.

The Maori and the orchid

Ian St George, Wellington

Recently I was contemplating a trip to Taranaki, and noticed on the map a place named Tawhitiraupeka. Fascinating. **Raupeka** is the Easter orchid, *Earina autumnalis*. **Tawhiti** is "a component of many place names, meaning Tahiti, and has been brought from the homeland of the Maori people".[1]

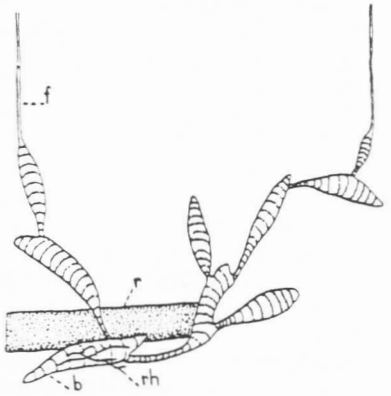
Was Tawhitiraupeka the place where an early Tahitian colonist found *E. autumnalis* and was so smitten with nostalgia for the *Earina* of the homeland that he/she named the spot after it?

Hooker listed "native and vernacular names" for the New Zealand plants.[2] Among them are: **hiri turiti** = various epiphytic orchids; **maikaika** = *Thelymitra pulchella* and *Orthoceras novae-zeelandiae* (but also the rengarenga lily and a rata); **makaika** = *O. novae-zeelandiae*; **perei** = *Gastrodia cunninghamii*; **piripiri** = *Bulbophyllum pygmaeum* (but also the common bidibidi - a different spelling of **piripiri** - and other plants).

Colenso wrote in 1880 of the vegetable foods of the Maori, among them "Another fleshy root, and that a tolerably large one, of the Orchis family, often the size of a middling-sized kumara, or of a stout, long-red radish root - the **perei** (*Gastrodia cunninghamii*) - was also eaten; but it was rather scarce, and only found in dense forests".[3]

Elsdon Best would expand on Colenso's observations in 1898: "...when digging for the ***perei***, an edible root (*Orthoceras solandri*) the diggers must not mention the name ***perei***, or the root will never be found. At such a time it is termed ***maikaika***." This was one of a number of ways of failing in food-gathering, called generally **puhore**. Thus "when going a-hunting, should you speak of the game as already caught... nothing will be taken during your hunt".[4] **Perei** meant the orchid tuber as one ate it - cleaned, dried, roasted, or whatever - and **maikaika** referred to the plant itself.

Best would write later that the **perei** was *Gastrodia cunninghamii*, and that "Some singular notions prevail among the natives in regard to the ***perei***. It did not, according to the Maori, originate in or from the earth, but was formed by the gods. Again, when engaged in digging for the roots the word ***perei*** must not be mentioned or no roots will be found. At such times it is termed ***maukuuku***.... The ***perei*** was dug in the winter season, and dried by exposure, as fern-root is. It was either roasted at a fire, or cooked in a steam-oven."[5]



Part of the underground system of *Gastrodia cunninghamii*; b = basal rhizome, f = base of stem, r = root of beech, rh = rhizomorph; (from Campbell E.O. The mycorrhiza of *Gastrodia cunninghamii*. *TRSNZ Botany* 1962. *1 (24): 289-296*)

Cheeseman added to Hooker's list: **maikaika** = *Microtis unifolia*; **maikuku** = *Thelymitra longifolia*; **mamaika** = *O. novae-zeelandiae*; **paratawhiti** = *O. novae-zeelandiae* (but also *Marattia fraxine* - a fern whose root was eaten); **peka-a-waka** = *Earina mucronata*; **tutukiwi** = *Pterostylis banksii*.[6]

In the second edition of his book, Cheeseman would add **huperei** = *G. cunninghamii*; **ikaika** = *O. novae-zeelandiae*; **para, perei** = tuber of *G. cunninghamii* or *O. novae-zeelandiae* used as food.[7]

Beever added **para, paratawhiti** = tuber; **parareka, paratarere** = varieties of tuber; **para kehe** = large tuber; **para ponaho** = small tuber.[8]

Moore had noted: **winika** = *Dendrobium cunninghamii*, "Its old Maori name, Winika, was given in 1838 to a big war canoe because this orchid grew on the totara tree whose trunk was hollowed out to form the hull. Te Winika was smashed by von Tempsky in 1863 but after reconstruction was used on ceremonial occasions on the Waikato River from 1938 to 1971, and was then donated to the Hamilton Museum".[9] The waka, Te Winika was refloated for the 1990 celebrations.

What have we then?[10]

Earina autumnalis; **raupeka**: **rau** = leaf; **peka** = branch; (**raupeka** as a verb means to droop).

Earina mucronata; **peka-a-waka**: **peka** = branch; **a** = of; **waka** = bird (but also canoe, etc).

Epiphytes; **hiri turiti**: **hiri** = rely, lean; **turi** = water.

Orthoceras novae-zeelandiae; **ikaika, mamaika, maikaika, makaika**: **ma** = white; **ika** = fish. (It is difficult to decide which of the several uses of **ma** and **ika** are meant here. The partial or complete reduplication of a word - in this case **ika** - generally diminishes the intensity of the meaning - thus **wera** = hot, **werawera** = rather hot - does **ikaika** mean "rather fishy"?); **para, perei** when prepared for food; **parareka** (also means potato), **reka** = palatable; **paratarere** = with a mottled skin; **para kehe** = large; **para ponaho** = small; **paratawhiti** = the **para** of Tahiti?

Gastrodia cunninghamii; **maukuuku**: **ma** = white; **uku** = fish; (but see above under *O. novae-zeelandiae*); **para, perei uhiperei, huperei** when prepared for food: (**uhi, uwhi** = yam).

Microtis unifolia; **maikaika**.

Thelymitra longifolia; **maikuku**.

Thelymitra pulchella; **maikaika**.

Bulbophyllum pygmaeum; **piripiri**: **piri** = stick, adhere, cling; be attached to; a closely woven mat.

Pterostylis banksii; **tutukiwi**: **tutu** = stand erect (thus **tutukiwi** = standing kiwi).

Dendrobium cunninghamii; **winika**.

References

1. Reed A.W. *A dictionary of Maori place names.* Reed Books, Auckland, 1982.
2. Hooker J.D. *Handbook of the New Zealand flora.* Reeve, London, 1867.
3. Colenso W. On the Vegetable Food of the Ancient New Zealander. *TNZI* 1880. 13: 31.
4. Best E. Omens and Superstitious Beliefs of the Maori. *Journal of the Polynesian Society* 1898. vii: 132.
5. Best E. Food products of Tuhoeland. *TRSNZ* 1902. 35: 53.
6. Cheeseman T.F. *Manual of the New Zealand flora.* Government Printer,Wellington, 1906.
7. Cheeseman, 2nd ed, 1925.
8. Beever J. *A dictionary of Maori plant names.* Auckland Botanical Society, 1987.
9. Moore L.B. and Irwin J.B. *The Oxford Book of New Zealand plants.* Reed, Wellington, 1978.
10. Williams M.A. *Dictionary of the Maori language, 7th ed.* GP Publications, Wellington 1991.

Further observations on *Corybas*

by Bruce Irwin, Tauranga

(the author continues his exploration of Corybas in a letter dated 5 November 1992)

Last week I spent two days searching for *Corybas* around Mt Ruapehu, mainly checking on colonies I had seen outside the flowering season. One flourishing colony on a dripping cliff near the Outdoor Pursuit Centre west of Ngaruahoe showed absolutely no sign of flowering. Perhaps it flowers during favorable seasons, but the thousand or so plants may all have resulted from vegetative reproduction.

Another smaller colony at the foot of Bruce Road, in bog, also showed no sign of flowering.

One flourishing colony I had found in October 1985 had disappeared without trace. *Pterostylis humilis* and *P. patens* were still there, so sprays couldn't be the culprit. I made incomplete drawings in 1985 of this *Corybas*. It didn't fit any form of the *C. rivularis* group known to me. However my luck changed late in the day. I drove twenty-five minutes along bush tracks that had seemed rough enough in a 4W.Drive last February to an extensive wetland at Rangataua, NE of Ohakune. I had seen many colonies of *Corybas* barely above water level during February. I soon spotted a couple of very beautiful dark red flowers, presumably hybrids of *C. trilobus*. The *C. trilobus* influence was very strong but the dorsal sepal was quite long. The plants were not really like the *C. trilobus* x *macranthus* plants from the north end of the Kaimais. Perhaps the other parent was a form of *C. rivularis*? There was only one small colony and normal *C. trilobus* was apparently absent - it may have been in the surrounding beech forest.

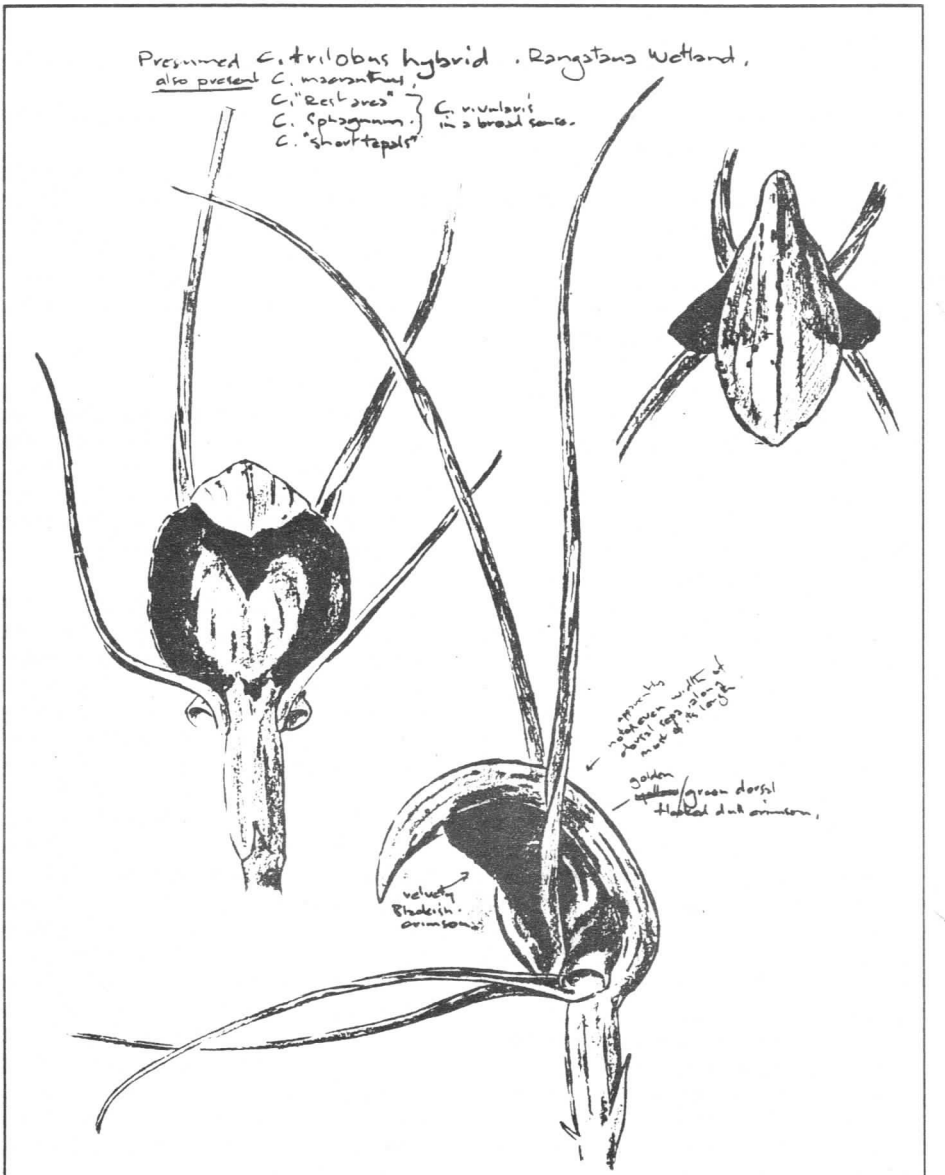
Next I found *C. macranthus* (?) with tiny buds right in the sinus of the leaf. I expect flower and leaf will separate by flowering stage.

Then surprise, surprise: flowers of the form found in 1985 and now completely absent from that locality - a rest area *(somewhere near the Desert Road)*. I feel sure it must be a separate species. I'll label this one *C.* "rest area" in the meantime.

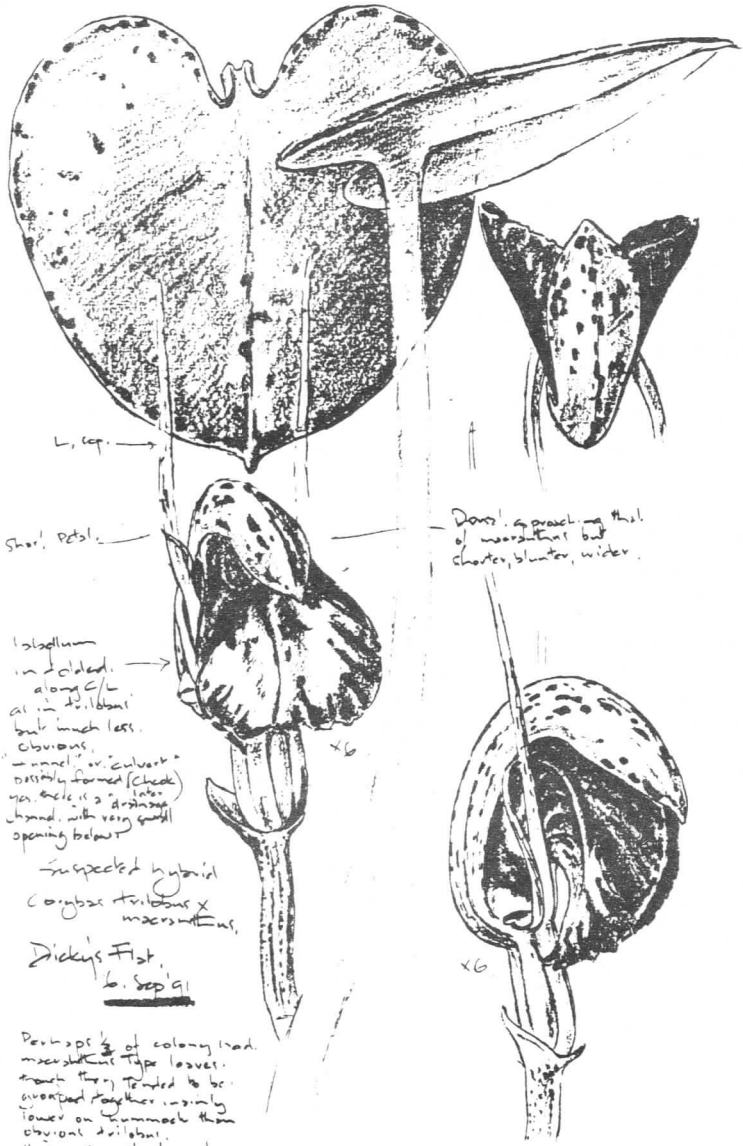
To round off the day I found a *Corybas* flowering more or less embedded in sphagnum cushions, the flowers just peeping out from top and sides. This form seems very like *C. longipetalus* which flowered more than seven weeks earlier in a much harsher habitat at Waiouru. Can they be one and the same?

Next day I found plants rather similar to this last form but smaller, along the Mangahuia Stream north of the isolated peak Hauhangatahi. Otherwise pickings were slim so I decided to return to my enchanted wetland at Rangataua. I had had to restrict my search the previous day to make sure of getting out before dark. It really is an enchanted wetland. I entered at exactly the same spot and headed in the same direction but the fairies had reorganised the habitat overnight. It seemed completely different. I encountered small groups of beech trees on slightly elevated ground where the previous day I had been in ankle deep water under tall manuka all the way. Incredibly I came out again at exactly the same spot as the day before. The fairies had removed most of the *Corybas*.... (I found) a small colony of *C.* "short tepals".

That made a total of five separate forms in a small part of an extensive wetland. What else is in there?



C. trilobus hybrid, Rangataua wetland



C. trilobus x *macranthus* hybrid, Dicky's Flat, upper Kaimais

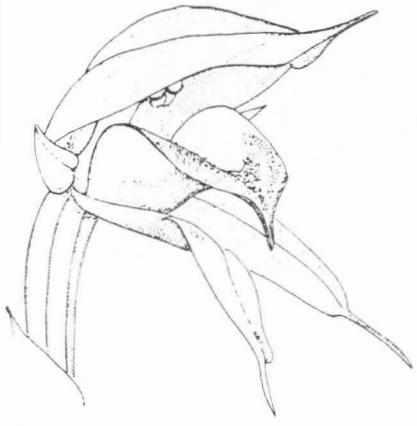
Notes

✾ Steve Savage writes, "Over the past summer a friend and I did a three hour walk to Mt Stevens in northwest Nelson to have a look at some orchids. *Lyperanthus* was found in high numbers growing in tussock ridges in saturated clay - about 40 percent of the plants were flowering in late January.

"Thousands of *Thelymitra cyanea* grew in large groups in the tussock as well.

"Down in the bush *Dendrobium* and the two *Earinas* grew profusely on trees, logs and on the leaf litter.

"8 August found me on D'Urville Island - a pighunting trip turned orchid hunting trip because of strong winds. I found *Acianthus sinclairii* and *Pterostylis alobula* growing side by side in thick regenerating scrub. Both were flowering strongly. There were about eighty *A. sinclairii* in a metre.



Acianthus sinclairii

"A retired friend found three large mats of *Bulbophyllum pygmaeum* in an estuary area growing on a semishaded clay bank only a few feet from the high tide mark. It was the first time he had come across *B. pygmaeum* in Nelson in three years.

"A point that some readers may find interesting - *Gastrodia* seems to be in low numbers wherever wild pigs live. The tuber would be a tasty morsel for a wild pig I imagine. Quite a few areas around Nelson prove this point."

✾ *William Colenso noticed the same thing in 1892:* "...the roots of these plants, which are tolerably large and fleshy... are edible by man (the old Maoris) and pigs. In fact, I have long been of the opinion that the main cause of this orchid being so rarely met with in its forest habitat is owing to its root being eagerly sought after and eaten by the wild pigs." *(Bush Jottings: No 2 [Botanical]. T.N.Z.I. 1892. 25: 308. Reprinted in the Group's Colenso on Orchids, p63-4) - Ed.*

✾ Barbara McGann writes from Oamaru, "I continue to keep an eye on Herbert State Forest. *Gastrodia* "long column" is the only new sighting (for me) in that area (one stem of sulphur-yellow and black-grey flowers, 80cm tall. Flower parts fitted description, in general, of *Flora II*, Dorothy Cooper's *Guide*, and Moore and Irwin's *Oxford NZ plants*, including the whitish tubercles of the last-named two books). Widespread logging of *Pinus radiata* has disturbed (wiped out!) quite a number of orchid habitats.

"An approx. 4m x 500m strip of ground has been set aside for the protection of some orchids - *Thelymitra pulchella*, *T. longifolia*, *T. cyanea*, *Caladenia lyallii*, *Pterostylis montana*, *Gastrodia cunninghamii*, and *G. minor*. Solid Dept of Conservation notices proclaiming NATIVE ORCHID RESERVE have been positioned at each end of the strip - in fact one of my best orchid spots was cleared to erect one of the notices! Road-widening right along one side of the reserve has disturbed some of the species. The *P. radiata* behind the strip has been felled leaving the ribbon of manuka much more open.

"It will be interesting to observe how the orchids re-establish themselves. Over the years the more dense the pines and manuka become the further out the various orchids grow.

"*T. cyanea* (formerly *T. venosa*) - I have a copy of *Field guide to Australian orchids* by Margaret Hodgson and Roland Paine, published 1989. It illustrates (but not in great detail) both species. I haven't caught up yet with why *T. venosa* in New Zealand is now *T. cyanea*."

✾ *Dan Hatch comments*: "In order to get the orchid volume of the new Flora of Australia reasonably right, critical study of the type material (by Mark Clements in the main) has been necessary.

"Clements considers that *T. venosa* R.Br. s.s. has a limited distribution in New South Wales and does not occur in New Zealand at all. Clements also considers that all the New Zealand plants he has examined match the type of *T. cyanea* (Lindl.) Benth., which also occurs in Australia.

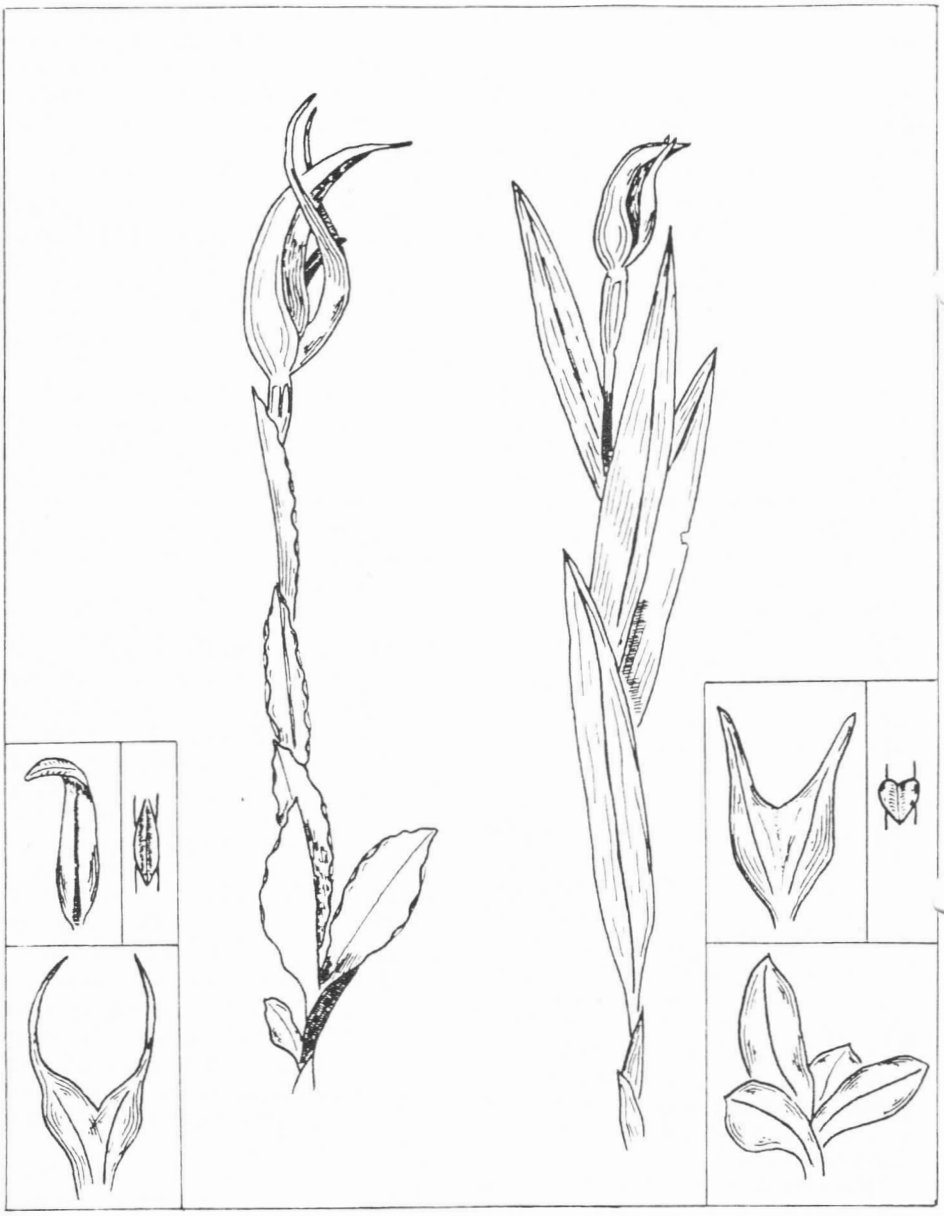
"The New Zealand forms of *T. cyanea* are nevertheless pretty variable and in 1952 I actually made three varieties to accomodate them.

"I would say now that the plants of the South, Stewart and Subantarctic islands are in fact *T. cyanea*. The problem of the more variable North Island forms is being looked into currently by Brian Molloy."

✾ Hatch's three varieties of *T venosa* were *typica*, *cedricsmithii*, and *cyanea* - see "The New Zealand Forms of *Thelymitra* J.R. and G. Forster and Appendices" *Trans. Roy. Soc. N.Z.* 1952. 79: 386-402, reprinted in NZNOG *Historical Series* 1989. 3: 126-155. *I must say there is a good deal of variability in the columns of the southern South Island plants too, and I doubt that I have ever seen one that had a column, nor yet the overall appearance of, the T. cyanea illustrated on page 294 of Jones's Native orchids of Australia - Ed.*

✾ **Errors in the last issue!** (1) The word is *Genoplesium*, of course (not *"Genioplesium"*). (2) In my attempt to list the NZ orchids: the *Pterostylis linearis* entry should have read "(separated in 1949 from *P. micromega* by Hatch who appears to have been right)". (3) The author of *Drymoanthus adversus* was Alick (not Allan) Dockrill - and his treatment of it was, as he explained in his preface, "at the suggestion of Mr E.D. Hatch of Auckland". (4) *Corybas carsei* was discovered at Lake Tongonge in 1910-11, not 1925. (5) In Ken Wilson's paper (page 5) the second sentence should read "I repotted thirteen of these straight into the new mix with **none** (not `more') of the original mix in it".

✾ *Drymoanthus* "spotted leaf" has been found near Eastbourne, Wellington.



Pterostylis furcata and *P linearis* (drawn by Dan Hatch thirty years ago)

Conservation comment

Orchids on the threatened indigenous vascular plant list

Readers of the New Zealand Botanical Society *Newsletter* of September 1992 will have noted the list of threatened plants, compiled as a result of a recommendation of the July 1991 Threatened Plant Symposium. The NZ Botanical Society appointed a committee of five, including NOG members Colin Ogle and Anthony Wright. DOC has agreed to meet the servicing costs of the committee, which will meet for the first time in February 1993.

Submissions are now invited, and should be sent before 31 January 1993 to Peter J. de Lange, Convenor, Threatened Plant Committee, Science and Research Division, Dept of Conservation, POB 10-420, Wellington.

The "current" list was compiled by David Given in 1990, and includes a number of orchids (* denotes "found naturally overseas):

Extinct: *Chiloglottis formicifera**, *Pterostylis nutans**.

Endangered: *Calaena minor**, *Calochilus herbaceus**, *Chiloglottis valida**, *Corybas carsei*, *Earina aestivalis*, *Pterostylis nana**, *P.* "linearis", *Thelymitra malvina**, *T. matthewsii**, *T.* "Ahipara".

Vulnerable: *Caladenia iridescens**, *Corybas* "short tepals", *Cryptostylis subulata**, *Prasophyllum* "aff. patens", *Pterostylis micromega** (*furcata?*), *Spiranthes* "motutangi", *Thelymitra* "rough leaf".

Local: *Bulbophyllum tuberculatum*, *Calochilus paludosus*, *C. robertsonii*, *Corybas rotundifolius*, *Yoania australis*.

Rare: *Thelymitra tholiformis*.

Indeterminate and insufficiently known: *Corybas cryptanthus*.

Australian Notes

✾ Jim Lykos reports the use of tissue or towel paper as a promising medium for the cultivation of a few terrestrial orchid genera (A.N.O.S. Sydney Group's *Orchidophile*, May 1991):

"... it has shown exceptional qualities for the propagation of a number of species, and in particular, for recovering sick or ailing terrestrial orchids.

"It provides a clean cellulose environment, disease resistant, easy to wet, retaining a beautifully balanced level of moisture, and as pliable a medium as one could wish. It is impossible to overwater and the

tuberoids formed in it are healthy and covered with white filaments. The paper medium also aids in the recovery of plants such as *Pterostylis* species affected by tuberoid rot.

"The idea dawned when I wanted to send a friend some bare root *Genioplesium* species by mail. I found that I had run out of sphagnum moss, and thought of using tissue paper as a substitute. The tissue paper was wrapped around a tuberoid in a furled or quarter folded style and put in a coffee mug to await finding a suitable box and the energy to go to the post office. Well they grew so well (next to a window ledge in the study) over the intervening weeks, on nothing but tap water, that I decided not to send them, but to continue with the experiment. They have now been in the mug two years and half of them flowered this summer."

❀ Paget's Australian Terrestrial Deciduous Orchids has stocks of dormant tubers and flasks. Andrew Paget is keen to obtain terrestrial orchid seed for his flasking programme, and will gladly give free flasks in return for seed. Write to him: POB 238, Mt Evelyn 3796.

Mapping scheme

The New Zealand Native Orchid Group's Mapping Scheme is supported by the Lottery Science Research division of the New Zealand Lottery Grants Board.

The Mapping Scheme has included reports sent in before a formal Scheme was begun, but formal participants have been the following forty or so people (at least a third of our members, to whom I am very grateful), who have sent reports from the different Ecological Regions: Nancy Adye, Mrs CL Aston, Ross Bishop, Delphine Cox, Sarah Beadel, Ella Campbell, D Catchpole, LP Chrystall, Noeleen Clements, Ida Collett, Peter de Lange, Pat Enright, Max Gibbs, Bob & Beryl Goodger, Dan Hatch, Margaret Hopkins, Bruce Irwin, Jean Jenks, Sandra Jones, Brian Killen, WF Liddy, Doug McCrae, Barbara McGann, David McNaughton, Pauline Mayhill, Mark Moorhouse, Manfred Peterek, Kevin Ross, Stella & John Rowe, Betty Seddon, Philip Simpson, Mary Skinner, Val Smith, TA Smith, Gordon Sylvester, IJ Tweedy, Gordon Watson, Morley West, AE Wright, Wilbur Wright, Lyn Young.

The Mapping Scheme officially finishes its data gathering stage at the end of 1992, but will continue to accept reports (of orchids sighted between 1972 and 1992) until the printing of the planned distribution monograph, probably late in 1993 (depending on the

outcome of a further grant application to Lottery Science Research).

An account of the Mapping Scheme is in preparation for *The Orchadian*, and will be reproduced in our *Journal* thereafter.

There follows a list of Regions, and the orchids reported from them.

1 Kermadec:

2 Three Kings: *Acianthus sinclairii, Drymoanthus adversus, Microtis unifolia, Thelymitra longifolia*

3 Te Paki: *Acianthus sinclairii, Bulbophyllum pygmaeum, Caladenia alata, C. minor, C.* "green column", *Calochilus herbaceus, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. cryptanthus, C. oblongus, C. trilobus, C. rotundifolius, Cyrtostylis oblonga, C. reniformis, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia sesamoides, Genoplesium pumilum, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum* "aff. patens", *Pterostylis alobula, P. nana, P. patens, P. plumosa, P. trullifolia, P.* "rubricaulis", *Spiranthes sinensis, Thelymitra aemula, T. carnea, T. longifolia, T. matthewsii, T. pauciflora, T. pulchella, T. tholiformis, T.* "aff. ixioides", *T.* "darkie", *T.* "rough leaf".

4 Aupouri: *Acianthus sinclairii, Caladenia alata, C. minor, C.* "green column", *Calochilus herbaceus, Corybas oblongus, C. trilobus, C. rotundifolius, Corybas* "A", *Cryptostylis subulata, Cyrtostylis oblonga, C. reniformis, Earina mucronata, Genoplesium pumilum, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis plumosa, P. trullifolia, Spiranthes sinensis, Thelymitra aemula, T. carnea, T. longifolia, T. malvina, T. pauciflora, T. pulchella, T.* "aff. ixioides", *T.* "Ahipara", *T.* "darkie", *T.* "rough leaf".

5 Hokianga: *Acianthus sinclairii, Bulbophyllum pygmaeum, B. tuberculatum, Caladenia alata, C. minor, C.* "green column", *Calochilus herbaceus, C. paludosus, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. oblongus, C. rivularis, C. trilobus, C. rotundifolius, Cyrtostylis oblonga, Dendrobium cunninghamii, Drymoanthus adversus, Earina aestivalis, E. autumnalis, E. mucronata, Gastrodia cunninghamii (?), Genoplesium pumilum, Microtis parviflora, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. brumalis, P. trullifolia, P.* "rubricaulis", *Spiranthes sinensis, Thelymitra aemula, T. carnea, T. cyanea, T. longifolia, T. malvina, T. pauciflora, T. pulchella, T. tholiformis, T.* "aff. ixioides", *T.* "darkie", *T.* "rough leaf".

6 Eastern Northland: *Acianthus sinclairii, Bulbophyllum pygmaeum, B. tuberculatum, Calochilus paludosus, Corybas acuminatus, C. rotundifolius, C. cheesemanii, C. oblongus, C. trilobus, Cyrtostylis reniformis, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Genioplesium pumilum, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. brumalis, P. graminea, P.* "rubricaulis", *P. trullifolia, Thelymitra aemula, T. carnea, T. longifolia, T. pauciflora, T. pulchella.*

7 Poor Knights: *Acianthus sinclairii, Caladenia catenata, Dendrobium cunninghamii, Earina autumnalis, E. mucronata, Microtis unifolia, Pterostylis alobula, P. banksii, Thelymitra longifolia*

8 Kaipara: *Acianthus sinclairii, Caladenia catenata, C. minor, C.* "green column", *Chiloglottis cornuta, Corybas acuminatus, C. oblongus, C. trilobus, Cyrtostylis oblonga, Earina mucronata, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Pterostylis banksii, P.* "rubricaulis", *Thelymitra aemula, T. longifolia, T. pauciflora, T. tholiformis, T.* "aff. ixioides", *Yoania australis.*

9 Auckland: *Acianthus sinclairii, Bulbophyllum pygmaeum, B. tuberculatum, Caladenia catenata, C. iridescens, C. minor, Chiloglottis cornuta, Corybas acuminatus, C. carsei, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Cyrtostylis oblonga, C. reniformis, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia minor, Genoplesium pumilum, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. brumalis, P. cardiostigma, P. graminea, P. plumosa, P. trullifolia, P.* "rubricaulis", *Thelymitra aemula, T. carnea, T. hatchii, T. longifolia, T. pauciflora, T. pulchella, T. tholiformis, T.* "intermedia", *Yoania australis.*

10 Coromandel: *Acianthus sinclairii, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia iridescens, C. minor, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Cyrtostylis oblonga, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, G. sesamoides, Genoplesium nudum, G. pumilum, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. brumalis, P. graminea, P. patens, P. plumosa, P. puberula, P. trullifolia, P.* "rubricaulis", *Thelymitra aemula, T. carnea, T. formosa, T. ixioides T. longifolia, T. pauciflora, T. pulchella, T.* "aff. ixioides", *T.* "intermedia", *Yoania australis.*

11 Waikato: *Acianthus sinclairii, Bulbophyllum pygmaeum, Caladenia catenata, Calochilus paludosus, C. robertsonii, Chiloglottis cornuta, Corybas carsei, C. cheesemanii, C. oblongus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. furcata, P. graminea, P. linearis, P. trullifolia, P.* "aff. montana", *Spiranthes sinensis, Thelymitra cyanea, T. pauciflora, T.* "intermedia"

12 Tainui: *Acianthus sinclairii, Bulbophyllum pygmaeum, Bulbophyllum tuberculatum, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Corybas* "A", *Corybas* "short tepals", *Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Microtis unifolia, Orthoceras novae-zeelandiae, Orthoceras novae-zeelandiae* forma *viride, Pterostylis alobula, P. banksii, P. cardiostigma, P. trullifolia, P.* "aff. montana", *Thelymitra longifolia, T. pauciflora.*

13 Northern Volcanic Plateau: *Acianthus sinclairii, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia alata, C. catenata, C. iridescens, Caleana minor, Calochilus paludosus, C. robertsonii, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, G. sesamoides, Microtis oligantha, M. parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. cardiostigma, P. graminea, P. trullifolia, P.* "rubricaulis", *P.* "aff. montana", *Spiranthes sinensis, Thelymitra aemula, T. carnea, T. decora, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T.* "aff. ixioides".

14 Whakatane: *Acianthus sinclairii, Bulbophyllum pygmaeum, B. tuberculatum, Caladenia catenata, Chiloglottis cornuta, Corybas trilobus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. graminea, P. trullifolia, Thelymitra longifolia, T. pauciflora, T.* "intermedia", .

15 Western Volcanic Plateau: *Aporostylis bifolia, Caladenia catenata, Calochilus robertsonii, Chiloglottis cornuta, Corybas acuminatus. C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, Genoplesium nudum, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum* "aff. patens", *P. colensoi, Pterostylis banksii, P. cardiostigma, P. foliata, P. graminea, P. linearis, P.* "aff. montana", *Spiranthes sinensis, Thelymitra decora, T. longifolia, T. cyanea.*

16 Central Volcanic Plateau: *Acianthus sinclairii, Aporostylis bifolia, Caladenia catenata, C. iridescens, C. lyallii, Calochilus robertsonii, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Drymoanthus adversus, D.* "spotted leaf", *Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, G. sesamoides, Genoplesium pumilum, Microtis oligantha, M. parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. cardiostigma, P. foliata, P. patens, P. trullifolia, P.* "aff.

montana", *P.* "linearis", *Spiranthes sinensis, Thelymitra cyanea, T. carnea, T. decora, T. formosa, T. longifolia, T. pauciflora, T.* "aff. ixioides".

17 Eastern Volcanic Plateau: *Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, C. iridescens, C. lyallii, Calochilus robertsonii, Chiloglottis cornuta, Chiloglottis valida, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. trilobus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, G. sesamoides, Genoplesium nudum, Microtis oligantha (?), M. parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. cardiostigma, P. graminea, P. patens, Pterostylis* "aff. montana", *Spiranthes sinensis, Thelymitra cyanea, T. decora, T. formosa, T. longifolia, T. pauciflora.*

18 Tongariro: *Acianthus viridis, Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, Caladenia iridescens, C. lyallii, Chiloglottis cornuta, Corybas macranthus, C. oblongus, C. rivularis, C. trilobus, Corybas* "A", *Earina autumnalis, mucronata, Gastrodia cunninghamii, Genoplesium nudum, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, P.* "aff. patens", *Pterostylis banksii, P. cardiostigma, P. graminea, P. furcata, P. linearis, P. patens, P.* "aff. montana", *Spiranthes sinensis, Thelymitra cyanea, T. decora, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T. pulchella, T.* "aff. ixioides".

19 Raukumara: *Acianthus sinclairii, Bulbophyllum tuberculatum, Corybas macranthus, oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Pterostylis banksii, P. graminea, Thelymitra longifolia*

20 East Cape: *Acianthus sinclairii, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Cyrtostylis reniformis, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, E. aestivalis, Genoplesium nudum, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. patens, P. trullifolia, Thelymitra decora, T. hatchii, T. longifolia, T. pauciflora*

21 Urewera: *Acianthus sinclairii, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Genoplesium nudum, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis banksii, P. cardiostigma, P. graminea, P. patens, P. trullifolia, Thelymitra cyanea, T. hatchii, T. longifolia, T. pauciflora,*

22 Wairoa: *Acianthus sinclairii, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. trilobus, Cyrtostylis reniformis, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Genoplesium nudum, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. cardiostigma, P. patens, P. trullifolia, Thelymitra carnea, T. longifolia,*

23 King Country: *Acianthus sinclairii, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Corybas* "A", *Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis banksii, P. graminea, P. patens, Thelymitra cyanea, T. decora, T. longifolia,*

24 Taranaki: *Acianthus sinclairii, Bulbophyllum pygmaeum, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, C.* "short tepals", *Corybas* "A", *Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Genoplesium nudum, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. banksii, P. cardiostigma, P. graminea, P. montana, P. trullifolia, P.* "aff. montana", *Thelymitra hatchii, T. longifolia, T. pauciflora.*

25 Egmont: *Acianthus sinclairii, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, C. lyallii, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis banksii, P. graminea , P. humilis, P. irsoniana, P. montana, P. patens, P. venosa, P.* "aff. montana", *Spiranthes sinensis, Thelymitra cyanea, T. hatchii, T. longifolia, T. pauciflora.*

26 Moawhango: *Aporostylis bifolia, Caladenia lyallii, Chiloglottis cornuta, Corybas macranthus, C. rivularis, C. trilobus, Gastrodia cunninghamii, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis tristis, P. patens, P. venosa, Thelymitra cyanea, T. decora, T. hatchii, T. longifolia*

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

28 Ruahine: *Aporostylis bifolia, Caladenia iridescens, Chiloglottis cornuta, Corybas macranthus, C. trilobus, Dendrobium cunninghamii, Earina mucronata, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. patens, P. venosa, Thelymitra longifolia, T. pauciflora.*

29 Hawke's Bay: *Acianthus sinclairii, Chiloglottis cornuta, Corybas macranthus, C. trilobus, Cyrtostylis reniformis, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia sesamoides, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. graminea, P. montana, P. trullifolia, Thelymitra cyanea, T. decora, T. formosa, T. hatchii, T. longifolia.*

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

31 Manawatu: *Bulbophyllum pygmaeum, B. tuberculatum, Chiloglottis cornuta, Corybas trilobus, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, G. sesamoides, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis banksii, P. graminea, P. montana, Spiranthes sinensis, Thelymitra longifolia.*

32 Manawatu Gorge:

33 Pahiatua: *Dendrobium cunninghamii, Earina autumnalis, E. mucronata, Thelymitra longifolia,*

34 Eastern Hawke's Bay: *Earina mucronata, Pterostylis trullifolia*

35 Eastern Wairarapa: *Microtis unifolia,*

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: *Acianthus sinclairii, Caladenia carnea, Corybas macranthus, C. trilobus, Microtis unifolia, Orthoceras novae-zeelandiae, Pterostylis alobula, P. foliata, P. graminea, Thelymitra longifolia,*

38 Tararua: *Acianthus sinclairii, A. viridis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, C. iridescens, C. lyallii, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. cryptanthus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Cyrtostylis oblonga, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. sesamoides, Lyperanthus antarcticus, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. australis, P. banksii, P. cardiostigma, P. foliata, P. graminea, P. montana, P. plumosa, P. trullifolia, Spiranthes sinensis, Thelymitra cyanea, T. decora, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T. pulchella, T.* "aff. ixioides".

39 Sounds-Wellington: *Acianthus sinclairii, A. viridis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia carnea, C. catenata, C. iridescens, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, D.* "spotted leaf", *Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. sesamoides, Genoplesium nudum, G. pumilum, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. banksii, P. cardiostigma, P. foliata, P. graminea, P. montana, P. plumosa, P. trullifolia, Thelymitra cyanea, T. decora, T.* "dentata", *T. formosa, T. hatchii, T. ixioides, T. longifolia, T. pauciflora, T. pulchella.*

40 Richmond: *Acianthus sinclairii, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia*

catenata, C. iridescens, C.lyallii, Chiloglottis cornuta, C. valida, Corybas oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia minor, G. sesamoides, Genoplesium pumilum, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. australis, P. banksii, P. foliata, P. graminea, P. montana, P. trullifolia, Thelymitra carnea, T. decora, T. hatchii, T. longifolia, T. pauciflora.

41 Wairau: *Corybas rivularis, Dendrobium cunninghamii, Earina autumnalis, E. mucronata, Gastrodia sesamoides, Orthoceras novae-zeelandiae.*

42 Inland Marlborough:

43 Molesworth: *Adenochilus gracilis, Aporostylis bifolia, Caladenia lyallii, Chiloglottis cornuta, Corybas macranthus, Earina mucronata, Microtis unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, Thelymitra cyanea, T. longifolia*

44 Clarence:

45 Kaikoura: *Drymoanthus adversus*

46 Northwest Nelson: *Acianthus sinclairii, A. viridis, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, C. iridescens, C. lyallii, Calochilus paludosus, Chiloglottis cornuta, Corybas acuminatus, C. cheesemanii, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, D. "spotted leaf", Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, Genoplesium pumilum, Lyperanthus antarcticus, Microtis oligantha, M. parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. australis, P. banksii, P. foliata, P. graminea, P. humilis, P. irsoniana, P. micromega, P. montana, P. oliveri, P. plumosa, P. trullifolia, P. venosa, Thelymitra carnea, T. cyanea, T. decora, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T. pulchella, T. "aff. ixioides", Yoania australis.*

47 Nelson: *Acianthus sinclairii, Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, C. iridescens, C. lyallii, Calochilus paludosus, Chiloglottis cornuta, Corybas acuminatus, C. cryptanthus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus adversus, D. "spotted leaf", Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, Genoplesium nudum, G. pumilum, Microtis unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis alobula, P. areolata, P. australis, P. banksii, P. foliata, P. graminea, P. humilis, P. irsoniana, P. montana, P. nana, P. oliveri, P. trullifolia, Thelymitra carnea, T. cyanea, T. decora, T. formosa, T. hatchii, T. longifolia, T. pauciflora.*

48 North Westland: *Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, C.lyallii, Chiloglottis cornuta, Corybas acuminatus, C. cryptanthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Genoplesium nudum, Microtis parviflora, M. unifolia, Orthoceras novae-zeelandiae, Prasophyllum colensoi, Pterostylis banksii, P. cardiostigma, P. graminea, P. irsoniana, P. montana, Thelymitra carnea, T. cyanea,* T. dentata, *T. longifolia,T. pauciflora, T. pulchella.*

49 Spenser: *Acianthus viridis, Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, C. lyallii, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, Genoplesium nudum, Microtis unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. graminea, P. irsoniana, P. oliveri, Thelymitra carnea, T. cyanea, T. hatchii, T. longifolia, T. pauciflora, T. pulchella.*

50 Whataroa: *Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. trilobus, D. cunninghamii, Drymoanthus adversus, Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Genoplesium nudum, Lyperanthus antarcticus, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. graminea, P. irsoniana, P. montana, Spiranthes sinensis, Thelymitra cyanea, T. longifolia,*

51 Aspiring: *Adenochilus gracilis, Aporostylis bifolia, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Gastrodia cunninghamii, G. minor, Lyperanthus antarcticus, Microtis oligantha, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. montana, P. venosa, Thelymitra cyanea, T. formosa, T. longifolia, T. pulchella.*

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: *Adenochilus gracilis, Aporostylis bifolia, Caladenia lyallii, Chiloglottis cornuta, C. valida, Corybas trilobus, Gastrodia cunninghamii, G. minor, Microtis unifolia, Pterostylis areolata, P. banksii, P. oliveri, Thelymitra longifolia*

55 Canterbury Foothills: *Caladenia catenata, C. lyallii, Chiloglottis cornuta, Corybas cryptanthus, C. macranthus, C. rivularis, C. trilobus, Gastrodia cunninghamii, G. minor(?), Microtis unifolia, Prasophyllum colensoi, Pterostylis areolata, P. banksii, P. irsoniana, P. montana, P. tristis, P. "aff. cycnocephala", Thelymitra cyanea, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T. pulchella.*

56 Canterbury Plains: *Pterostylis tristis, P. "aff. cycnocephala", 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: *Adenochilus gracilis, Aporostylis bifolia, Chiloglottis cornuta,*

60 Tasman: *Caladenia lyallii.*

61 Pareora: *Microtis unifolia*

62 Wainomo:

63 MacKenzie: *Aporostylis bifolia, Chiloglottis cornuta, Prasophyllum colensoi.*

64 Waitaki: *Microtis unifolia, Prasophyllum colensoi, Pterostylis* aff. *cycnocephala, Thelymitra longifolia*

65 Kakanui: *Aporostylis bifolia, Caladenia lyallii, Chiloglottis cornuta, Corybas macranthus, C. trilobus, Gastrodia cunninghamii, G.* "long column", *G. minor, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis banksii, P.* aff. *cycnocephala, P. foliata, P. graminea, P. montana, P.* "aff. montana", *Thelymitra cyanea, T. decora, T. hatchii, T. longifolia, T. pauciflora, T. pulchella.*

66 Lakes: *Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, Chiloglottis cornuta, Corybas macranthus, C. rivularis, C. trilobus, C.* "short tepals", *Earina mucronata, Gastrodia cunninghamii, G. minor, G.* "long column", *Lyperanthus antarcticus, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. venosa, P.* "aff. cycnocephala", *Thelymitra cyanea, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T. pulchella.*

67 Central Otago: *Aporostylis bifolia, Caladenia lyallii, Corybas macranthus, Lyperanthus antarcticus, Microtis oligantha, Microtis unifolia, Prasophyllum colensoi, Pterostylis* "aff. cycnocephala", *P. tristis, Thelymitra longifolia*

68 Lammerlaw: *Adenochilus gracilis, Aporostylis bifolia, Caladenia lyallii, Chiloglottis cornuta, Corybas macranthus, C. rivularis, C. trilobus, Gastrodia minor, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Thelymitra pauciflora.*

69 Otago Coast: *Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, C. lyallii, Chiloglottis cornuta, Corybas macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus* "spotted leaf", *Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, Lyperanthus antarcticus, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis areolata, P. australis, P. banksii, P. graminea, P. montana, P. venosa, P.* "aff. cycnocephala", *P.* "aff. montana", *Thelymitra cyanea, T. formosa, T. hatchii, T. longifolia, T. pauciflora, T. pulchella.*

70 Catlins: *Adenochilus gracilis, Aporostylis bifolia, Caladenia lyallii, C. minor, Chiloglottis cornuta, Corybas macranthus, C. oblongus, C. trilobus, Dendrobium cunninghamii, Drymoanthus* "spotted leaf", *Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Lyperanthus antarcticus, Microtis unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. graminea, P. montana, P. venosa, P.* "aff. montana", *Thelymitra cyanea, T. hatchii, T. pulchella.*

71 Olivine: *Corybas acuminatus, Pterostylis australis, Spiranthes sinensis, Thelymitra longifolia.*

72 Fiord: *Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, C. minor, C.lyallii, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus*

adversus, Earina autumnalis, E. mucronata, Lyperanthus antarcticus, Microtis unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. graminea, Thelymitra cyanea, T. longifolia.

73 Mavora: *Acianthus viridis, Adenochilus gracilis, Aporostylis bifolia, Caladenia lyallii, C. minor, Chiloglottis cornuta, Corybas macranthus, C. rivularis, C. trilobus, Gastrodia cunninghamii, G. minor, G.* "long column", *Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis areolata, P. australis, P. banksii, P. montana, Thelymitra hatchii, T. longifolia, T. pauciflora, T. pulchella.*

74 Waikaia: *Adenochilus gracilis, Aporostylis bifolia, Caladenia lyallii, Chiloglottis cornuta, Corybas macranthus, C. trilobus, Gastrodia cunninghamii, Lyperanthus antarcticus, Microtis unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. venosa, Thelymitra cyanea*

75 Gore:

76 Southland Hills: *Corybas trilobus, Thelymitra pauciflora.*

77 Te Wae Wae: *Acianthus viridis, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia lyallii, C. minor, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, Dendrobium cunninghamii, Drymoanthus* "spotted leaf", *Earina autumnalis, E. mucronata, Gastrodia cunninghamii, Lyperanthus antarcticus, Microtis unifolia, Prasophyllum colensoi, Pterostylis banksii, P. venosa, Thelymitra cyanea, T. hatchii, T. longifolia, T. pulchella.*

78 Makarewa: *Chiloglottis cornuta, Corybas oblongus, Corybas trilobus, Drymoanthus* "spotted leaf", *Gastrodia minor, G.* "long column", *Microtis oligantha, M. unifolia, Pterostylis australis, P. banksii, P. graminea, P. montana, P. venosa, Thelymitra cyanea, T. hatchii, T. longifolia, T. pulchella.*

79 Rakiura: *Acianthus sinclairii, Acianthus viridis, Adenochilus gracilis, Aporostylis bifolia, Bulbophyllum pygmaeum, Caladenia catenata, Caladenia lyallii, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. rivularis, C. trilobus, C.* "short tepals", *Dendrobium cunninghamii, Drymoanthus* "spotted leaf", *Earina autumnalis, E. mucronata, Gastrodia cunninghamii, G. minor, G.* "long column", *Lyperanthus antarcticus, Microtis oligantha, M. unifolia, Prasophyllum colensoi, Pterostylis banksii, P. graminea, P. irsoniana, P. montana, P. venosa, Thelymitra cyanea, T. hatchii, T. longifolia, T. pulchella,*

80 Chatham: *Acianthus sinclairii, Adenochilus gracilis, Aporostylis bifolia, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. macranthus, C. oblongus, C. trilobus, Drymoanthus adversus, Earina aestivalis, E. autumnalis, E. mucronata, Microtis unifolia, Prasophyllum colensoi, Pterostylis australis, P. banksii, P. micromega, Thelymitra cyanea, T. longifolia, T. pulchella.*

81 Bounty:

82 Antipodes: *Aporostylis bifolia, Chiloglottis cornuta, Corybas trilobus, Prasophyllum colensoi*

83 Auckland Is. : *Acianthus viridis, Aporostylis bifolia, Caladenia catenata, Chiloglottis cornuta, Corybas acuminatus, C. oblongus, C. rivularis, Lyperanthus antarcticus, Thelymitra longifolia.*

84 Campbell: *Aporostylis bifolia, Chiloglottis cornuta, Corybas trilobus, Lyperanthus antarcticus*

85 Macquarie: *Corybas macranthus*

Historical reprint

During a winter break on the Hawaiian island of Maui I visited the old whaling town of Lahaina, and therein a shop that sold historical prints. Among the prints on offer were many torn from Cook's account of the third voyage.

I have often wondered what happens to the emasculated books when these printshop vandals have done their damage, so I asked the proprietor about it. To cut a long story short, I got for $100 all three volumes of the second edition of *A Voyage to the Pacific Ocean undertaken, by the Command of His Majesty, for making Discoveries in the Northern Hemisphere, performed under the Direction of Captains Cook, Clerke, and Gore, in His Majesty's Ships the* Resolution *and* Discovery*; in the Years 1776, 1777, 1778, 1779, and 1780. In three Volumes. Vol. I. and II. written by James Cook F.R.S. Vol. III. by James King LL.D. and F.R.S.* London; H. Hughs, 1785.

No illustrations of course, but the print a delight to read.

In our book *The New Zealand orchids: natural history and cultivation,* Brian Molloy suggested that the predominantly self-pollinating nature of New Zealand orchids may be in part an adaptation to an environment relatively poor in insect species.

Cook had noticed the rarity of insects too: reproduced here are his last few paragraphs on the New Zealand fauna, from February 1777: page 153 of Vol. I.

Inſects are very rare. Of theſe, we only ſaw two ſorts of dragon-flies, ſome butterflies, ſmall graſhoppers, ſeveral ſorts of ſpiders, ſome ſmall black ants, and vaſt numbers of ſcorpion flies, with whoſe chirping the woods reſound. The only noxious one is the ſand-fly, very numerous here, and almoſt as troubleſome as the muſquitoe; for we found no reptile here, except two or three ſorts of ſmall harmleſs lizards *.

It is remarkable, that, in this extenſive land, there ſhould not even be the traces of any quadruped, only excepting a few rats, and a ſort of fox-dog, which is a domeſtic animal with the natives.

Neither is there any mineral worth notice, but a green jaſper or ſerpent-ſtone, of which the New Zealanders make their tools and ornaments. This is eſteemed a precious article by them; and they have ſome ſuperſtitious notions about the method of its generation, which we could not perfectly underſtand. It is plain, however, that wherever it may be found (which, they ſay, is in the channel of a large river far to the Southward), it is diſpoſed in the earth in thin layers, or, perhaps, in detached pieces, like our flints; for the edges of thoſe pieces, which have not been cut, are covered with a whitiſh cruſt like theſe. A piece of this ſort was purchaſed, about eighteen inches long, a foot broad, and near two inches thick; which yet ſeemed to be only the fragment of a larger piece.

The natives do not exceed the common ſtature of Euro-

* In a ſeparate memorandum-book, Mr. Anderſon mentions the monſtrous animal of the lizard kind, deſcribed by the two boys after they left the iſland.