

Gastrodia cunninghamii from Stewart Island.
Watercolour by Dorothy Jenkin, 1965; Rakiura Museum collection; see p24.

The science of scents—1: Orchid odours

*And the jessamine faint, and the sweet tuberose,
The sweetest flower for scent that blows —Shelley.*

This paper is largely a shortened and embellished version of “Fragrance and orchids”, a talk given by Linet Hamman in 1999: (www.orchidssa.co.za/fragrance.htm). Ms Hamman has given her permission—Ed.

Composition

Flower fragrance is a combination of volatile (ie easily evaporated) substances found in plants. These essential oils are stored in special cells (osmophores) at the periphery of flowers, leaves or roots. Only small amounts are present as the substances can be toxic to the plant. These fragrant oils can consist of few to many compounds.

There appear to be eleven major compounds most frequently produced in orchid flowers. They have all been identified from other essential oils and are widely distributed throughout the plant kingdom. Here are some examples of orchid scents:

- cineole (medicinal) *Brassavola nodosa*;
- citronellol (rose-like) *Brassavola digbyana*;
- benzyl acetate (jasmine) *Stanhopea tricornis*, *Cynoches ventricosum*;
- d-carvone (rye bread) *Catasetum discolor*;
- methyl salicylate (wintergreen) *Catasetum collare*;
- methyl cinnamate (cinnamon) *Catasetum roseum*, *Stanhopea saccata*, *Gongora quinquenervis*;
- eugenol (cloves) *Gongora quinquenervis*;
- 1,8-cineole (Vicks) *Stanhopea cirrhata*;
- linalool (lily-of-the-valley) *Brassavola digbyana*, *Gongora quinquenervis*.

Jasmine has ten chemical compounds to make up its fragrance. Three to ten produce roses' aroma. White freesia has ten. The lotus and the honeysuckle each use six.

Production

As many as 75% of all orchid flowers have odour. That is, they emit chemical compounds detectable to humans - some are pleasantly fragrant while others have repulsive smells. Many fragrances contain complex substances closely related to the body chemistry of the pollinator they are supposed to attract.

Fragrances are produced in the osmophores which can be anywhere on a flower or bud. They require intense physiological activity and are a large drain on the plant's energy. The chemical turnover may even produce warmth.

All flower parts can produce odours, from sepals and petals to calluses and basal spurs. Osmophores in orchids may be diffuse and function only in very general attraction, or they may be confined to certain regions of the flower so that pollinators are attracted to these specific areas and remove or deposit pollinia in the process. They are most often situated on the lip - e.g. *Stanhopea*, *Herschelia* and *Catasetum*.

Members of the *Catasetinae* and *Gongorinae* subtribes produce the largest quantities of scent known among orchids.

The fragrance of *Catasetum* flowers is interrupted within a few hours of pollination to conserve energy by limiting osmophore activity.

The lip of an orchid flower is often adorned with decorative calli. These calli and other flower parts may contain unicellular trichomes (hairs), papillae and scales that produce starch, proteins, oil drops, fragrances and other substances to attract the pollinators. While feeding or scratching and gnawing the calli, the pollinators may pollinate the plant.

The intricate flowers of the scented *Gongoras* last only for two or three days but compensate for this by several opening in

succession. If the lip (where the scent is produced) is removed, the flower lasts for two to three weeks. In some plants other segments than the lip take over the function: a urine-like smell is produced at the tips of the long tepals in *Phragmipedium caudatum*. The long tails of the sepals of *Cirrhopetalum ornatissimum* give rise to an odour of whale oil, while the lip smells of fresh herring!

Orchid fragrances are produced in a daily cycle with the time of maximum fragrance coinciding with maximum pollinator activity, thus using the least energy to achieve the maximum effect.

Lady of the Night orchid (*Brassavola nodosa*) will perfume a warm summer's evening with its heavy fragrance. The medicinal sweet odour is released shortly after sunset, reaching maximum strength around midnight, and fading quickly after sunrise. Under experimental conditions of extended darkness, the flower scent of *Brassavola* remains, though at lower levels than during the normal night cycle. Scent release is strictly a light-controlled phenomenon; it is not regulated by any endogenous clock, but by a photochrome trigger. It is the flower that detects the presence or absence of daylight.

Bee-pollinated flowers are fragrant early in the day. *Cattleya luteola*, for example, is very fragrant between 4 and 8 am. It is usually visited by bees between 5:30 and 5:45. Most bee-pollinated orchids are not fragrant after nightfall and are barely scented at all on dark, grey days. Most daytime pollinated flowers are brightly coloured.

Fragrances may change throughout the day both quantitatively and qualitatively as well as from day to day: *Clowesia rosea* smells of Vicks Vaporub in the morning and cinnamon in the afternoon. *Catasetum expansum* smells of turpentine in the morning and rye bread in the afternoon. *Epidendrum falcatum* changes fragrance quality and intensity during the day, from the delicate, haunting scent of jasmine in the morning to a stronger note resembling that of Easter lilies or narcissi during the afternoon.

Fragrant orchids and pollination

Fragrant compounds can be manufactured synthetically and used to identify pollinators in the field. Insects are by far the most important orchid pollinators, but, because of their compound eyes they have great difficulty seeing the colours of orchid flowers from any great distance. Yet they unerringly head for flowers of specific colour. The initial attractant (over a long distance) is actually fragrance in most instances. When the insect approaches a flower of "proper" fragrance, it eventually gets close enough to be guided visually to a successful landing.

Moth pollinated orchids

Nearly 8% of orchid species are moth-pollinated (phalenophilous) and night-scented. Delightful scents such as jasmine, honeysuckle, tuberose, lilies and gardenia are mostly given off at night. Flowers pollinated nocturnally (mainly moth-pollinated flowers) have strong night-time odours and abundant nectar and are generally white or light green. The light-coloured flowers also present a strong landing platform—a characteristically larger labellum—which is more readily visible to moths when they follow the scent trail to flowers. Good examples are most *Angraecum* and *Brassavola* species.

Flower and pollinator are adapted to one another. *Angraecum sesquipedale* native to Madagascar is a well known example. This is one of the most beautiful and extraordinary *Angraecum* species. The large star-shaped waxy flowers are completely scentless during the day, but with the onset of darkness they exude an attractive and powerful scent until the following morning. The fresh-floral scent of the flower is fully developed by the third or fourth night. The pollinator (the moth *Xanthopan morgani* forma *praedicta*) needs a proboscis that matches the 20-35 cm long spur of the flower to reach the nectar at the bottom.

Fly pollinated orchids

In dramatic contrast to the night-scented orchids are the putrid and faecal scents of those orchids which mimic carrion in both odour (stench) and colour, and thus attract

carion-feeding insects like flies. These are especially well represented by *Cirrhopetalum*, which is spread across southeast Asia.

The Colombian *Dracula chesteronii* attracts a fly which normally lays its eggs on a fungus. The flower gives off a mushroom-like scent and its labellum is similar in shape, size and smell to the fungus that lives in the same conditions.

Bee pollinated orchids

About 60% of orchids are pollinated by Hymenoptera (bees, wasps). The flowers are fragrant with scents of lily-of-the-valley, rose, sweet pea, hyacinth, carnation, primula, lime-blossom, violet, narcissus and many combinations. Scent is produced during daytime, the time the insects are active. Flowers are often bright violet, blue, green and yellow (bees do not see red).

Orchids like *Coryanthes*, *Gongora*, *Stanhopea* and *Castasetum* do not produce any nectar but attract their pollinators, male euglossine bees, by the intensity and quantity of their scent. Scent drops are collected on the hairy front legs of the bees and transferred to the back legs where it is stored. Apparently the scent is collected and then converted to sexual pheromones which attract the females.

The scent, and often the shape of the flower, is specific and attracts a specific species of euglossine bee (of which there are about 180).

The remarkable insect-like flowers of *Ophrys* species do not produce nectar or usable pollen. They imitate the female wasp or bee both in appearance and scent. The powerful scent, similar to that of the sexual pheromone of the female, attracts male insects over a long range and, in their attempt to mate with the flower, pollination takes place. So powerful is this attraction that in controlled experiments male insects actually preferred the *Ophrys* flower to the female insect.

Flowers pollinated by butterflies and birds do not have a well developed scent because they rely mostly on colour or nectar to attract their pollinators.

Transmitting scent in hybridising

Disa breeders in South Africa believe that fragrance is inherited only maternally (through the pod parent) rather than the pollen parent. In *Paphiopedilum*, however, fragrance can be transmitted by the pollen. *Paph. delenatii* smells like citrus blooms and *Paph. malipoense* has a very powerful raspberry fragrance. They are the two most fragrant Paphs in the Parvisepalum section. Some clones are more heavily scented than others, especially in the morning when the sun first reaches the bloom.

Crossing these two (*Paph Lynleigh Koopowitz*) produced a pleasant fragrance of raspberries. *Paph Wossner Jade (malipoense x niveum)* produced only a limited number of fragrant offspring.

The fragrance of *Paphiopedilum emersonii* is compared to a mixture of chocolate and a freshly turned compost pile! When *Paph. emersonii* is bred with *Paph. delenatii* to create *Paph. Joyce Hasagawa* a powerful old-fashioned rose scent emerges - in this case, mixing the fragrances from these two species created a desirable fragrance quite unlike either of the parents.

The *Cattleya* alliance provides the greatest variety of scent of all the orchids. Hybridisation has extended the possibilities of fragrance to include scents of carnation and spice, lemon, orange and apricot, vanilla and rose. Not all clones of the same grex will necessarily have the same blend or degree of fragrance.

Rhyncolaelia (Brassavola) digbyana, native to Central America, is a wonderfully fragrant and handsome parent producing a strong lemon perfume. It is often used in complex *Cattleya* hybridising. The flower is not ready for pollination until fully opened and loses its scent when pollinated. *Rhyncolaelia glauca* emits a rosy-floral scent. *Neofinetia falcata*, which is fragrant during the day and night, awards most of its progeny with fragrance.

1: 2003 National Park SPLOSH (Swamp Pterostylis Location & Other Species Hunt)

Fri. 3 Jan 03 It was the Column's lucky break this time, walking straight onto three healthy *Pterostylis micromega* flowers in a new colony, in the Whakapapa area, after spending the morning driving down with Allan Ducker, Bev Woolley and Anne Fraser. Nick Singers was holding his preliminary SPLOSH in this civilised bog among the lahar mounds. Can you believe, that 17 souls, including DoC's Robyn Whyman and Nick, chose to spend a New Year's weekend sloshing around in subalpine muck and scrub, seeking rare orchids? For the third year, this mutually beneficial arrangement between DoC and NZNOG produced most rewarding results. Less rewarding were the many mud filled gumboots and permanently dyed brown trousers, shirts, hats etc. One small area in the mounds, near those *P. micromega*, rewarded us also with *Thelymitra formosa*, *T. pulchella*, and *T. nervosa* plus *Prasophyllum colensoi*; all wide open in the heat. Previously *P. paludosa* and *T. cyanea* were in evidence here but none appeared this season. The late cold snap was blamed for the curious lack. Previously marked *P. micromega* sites here, had only seedlings and buds this year.

Next call, National Park Wetland which the NOG had virtually written off due to the serried hippo wallows on the old access track [J59:25] but Nick's new route up the HT line track made a late afternoon visit attractive. Numerous *Pterostylis patens* with short broad leaves in light shade on the steep part, caused some head scratching but those in the deep shade had the normal grass like long leaves and Bruce Irwin says this variation is normal. Some *P. micromega* were in bud at marked sites in the wetland

but the white column-armed *T. cyanea* were open on the firmer parts of the HT track-over-the-bog. Doreen Abraham and the Column lost their way out so crashed a new track across the Makaretu Stream rather than haul themselves back up the steep pinch to the track proper.

Sat. 4 Jan 03. 18 souls today. Gary Penniall came for the day and DoC's Petra joined us at Ohakune in the midst of a disgraceful sacrifice of chocolate eclairs with Anne the ring leader. Tangiwai "A" Wetland by Route 49 yielded a few nice *P. micromega* flowers where Nick's team had been weeding and pruning rushes and scrub inside their fence. The prepared plan had paid off admirably. Telephoto close-ups saved both the Column from lying in the muck and numerous seedling rosettes from being disturbed. Some pale *Gastrodia minor* with numerous flowers open were identified as stunted *G. aff. sesamoides* by the Column but Bruce pointed out the short column and clinched the ID. Don't you hate it when he does that? But why were *G. minor* so pale? New taxon maybe? In the confusion, no photos or records were taken and the Column for one is still wondering.

Off again, past the Paramanawera (was Rangataua) swamp to a new Rangataua Wetland in tea-tree, by the old railway embankment to the once sawmill town of Rangataua. Doreen needed a break before plunging in and just happened to be first, again, to spot *P. micromega* flowers, from the embankment. Three teams of 6 plodded through this semi-civilised swamp continually finding *P. micromega*, some in flower, mostly on the edges of Empodisma clumps. Only Judith Tyler was crestfallen at not finding any of her own. *P. paludosa*, eluded the Column but Bruce spotted a few on the QT. The afternoon heat became oppressive, so on the walk out to Rangataua and whilst waiting for the vehicles to drive around, and for Robbie Graham to

photograph some *Prasophyllum* “B”, Anne and the three nee Francis sisters, Margaret, Glyn and Claire, took a dip in a frigid stream straight off the Mangaehuehu Glacier.

Tigers for punishment those girls.

On to Middle Rd, Horopito where *P. montana sensu* Moore got some attention as did a port-wine stemmed *Prasophyllum* “A” (Fig. 1, & J79:9). The *P.* “A” exasperated the Column, with macro camera and Anne on the cable release. Apart from serried mechanical difficulties, the awkward position necessary for in situ photography caused the Column a spasm of cramp. His suddenly straightened leg broke off another purple *P.* “A”, and the purple air woke Bev from her reverie in the car! So much for the conservation efforts.

Sun. 5 Jan 03. No spare day for the troops this SPLOSH so the keen ones were up at daybreak, out and around the DoC Lodge for 2 *P. aff. montana* taxa. Allan had a short-nosed specimen by the paved Whakapapa walk (Fig. 2) whose flower could have been Dan Hatch’s original but the leaves were too short. The long leafed one (Fig. 3) 20m from the Lodge, under black mountain beech also came close to *P. montana* s.s. except for its long red dorsal sepal. The Column has been saying, “Tag name them!” but where does one start with this complex? Numerous colonies flowered around the Lodge, all with slight variations which caused protracted, circular debate around the video screen that evening, among Robbie Graham, Bruce and Allan, the video expert.

Nick arrived with the drizzle that morning and we moved out past Erua to a forlorn hope, *Pinus radiata* plantation. Nick had been monitoring ’possum traps here 2 years before but windfalls had since blocked the track in many places so it was a while before the troops entered the most treacherous bog of the whole conservancy. Old faithful *Empodisma minus*, usually good for landing helicopters, here had hidden slots which let unwary souls down to their thighs. No one escaped, no one saw a rare orchid and

everyone got soaked in the drizzle. Lunch under a copse of bog pine (*Halocarpus bidwillii*) still had Bruce and Judith floundering, out of control in the muck (no, not together!) before getting settled. Believe it or not, everyone was still smiling, including the two octogenarians, one with stainless steel hips! Back at the Lodge, that bog colour would not rinse out, but a cordon bleu steak dinner, cooked by Robbie and David McConachie, revived the flagging spirits.

Mon. 6 Jan 03. Home day, but that hard-hearted Nick had other plans for the morning to most everyone’s delight! So. Back into the civilised swamp it was, higher in the lahar mounds, in an attempt to find *P. paludosa* where Bev saw it on an earlier trip. Margaret Menzies’s whoopee announced one colony; and Bruce, on a southern arm, spotted about 6 more, some with spent flowers. *P. paludosa* was not nearly as prevalent as on previous SPLOSHes. Some *Prasophyllum* leaves with only bud bulges, gave promise of *P. aff. patens* but orchids were scarce so 5 open *Aporostylis bifolia* got unusual attention.

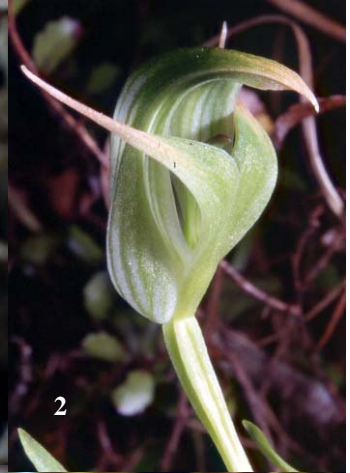
But, Nick hadn’t finished yet. A stream by SH4, south of National Park village, widened into an ideal (?) fen of *Baumea*

Figures—p7.

1. *Prasophyllum* “A” with port-wine peduncle from Middle Rd. Horopito
2. *Pterostylis* aff. *montana* short, green nosed from Whakapapa Walk trackside.
3. *Pterostylis* aff. *montana* long red nosed from Whakapapa beech forest
4. Unusually bright orange labellum on *Earina aestivalis* ex Bruce Irwin’s cool house.
7. *Nematoceras* “Sphagnum” Blue Creek, Nelson, a new record for ER 46.
8. *Nematoceras* “trileaf bract” with dorsal sepal crimping up the labellum lobes.
9. *Nematoceras* “trileaf bract” showing floral bract, a replica of its leaf.



1



2



3



4



7



8



9



KEY	
10	13
11	14
16	15
12	



rubiginosa so off we floundered. Nick was first with a *P. micromega*, Glyn Wren was next with a healthy *Prasophyllum* “B” colony just past a bridge of railway sleepers. But that was it for the orchids. Lunch on the bank by SH4 was marred by speeding cars bearing down 3 abreast on Brian and Judith Tyler lunching at the bottom of the bank. That scare plus treacherous bogs, getting lost in the scrub, photographer’s cramp and drivers going to sleep at the wheel (who? don’t ask) are just some of the privations that the team faced, fearlessly for your reading pleasure, oh gentle reader. David could not repeat his triumphant best finds of the two previous SPLOSHes but contributed notably along with Don Isles, his chauffeur.

Many thanks to Nick for arranging the SPLOSH and for wielding the figurative whip; to Robbie for doing the grocery shopping; to John Groom for the box of great mandarins; to the expert volunteer cooks and to the guys who organised the washing up and cleaning out.

2: *Earina mucronata* — *E. aestivalis* sequel

Figures—continued (p8).

10. *Nematoceras* “darkie” from Dip Flat, Upper Wairau R.
11. *Nematoceras papillosa* Col. with transparent base to labellum and recurved dorsal sepal tip.
12. *Nematoceras* “round-leaf” but with flower below the leaf c.f. J63 p12.
13. *Nematoceras* “Trotters” from ER 49, the best bug eaten flower on 22 Dec 02.
14. *Singularybas oblongus* alba from Greymouth lacking red, bract with entire margins cf. Fig. 15.
15. *Singularybas oblongus* alba from Clevedon 9 Oct 97 with red veined leaves, undulated bract.
16. *S. oblongus* alba” from St Arnaud, with ragged fringe, red in pedicel and undulate bract and peduncle.

Bruce brought some specimens of *Earina aestivalis* and rekindled an old enigma during the National Park SPLOSH. The flowers were complete with the deflexed sepals, prominent columns, lemon leaf perfume and early January flowering which define the species for some. He had picked these from 3 rescued clumps at his Tauranga home where they had started off years before as *E. mucronata* flowering in October, complete with a dumpy column concealed amongst the tepals [J75 pp17-19]. Dan Hatch had the same experience and had evidently influenced Lucy Moore to lump them [Flora II p. 160]. Bruce’s best has a strong orange labellum (Fig. 4) but the Column didn’t buy the hypothesis that a species with one set of characters can change into a similar species with a different set of characters. Both species must have been present in Bruce’s and Dan’s clumps. *E. mucronata* which prefers a wetter, montane climate, could well have declined in the drier climes of captivity at low altitude and let the more coastal *E. aestivalis* take over. What do you think?

Back at home the Column searched out some slides taken months apart which drove another wedge between the species. You see, TF Cheeseman differentiated between leaf cross sections in the Manual, 1925 p335, so the Column had photographed sections of healthy leaves from a flowering *E. aestivalis* (Fig. 5) on 27 Feb 01 from his Feijoa tree in dry Papakura and a flowering *E. mucronata* (Fig. 6) 4 Oct 02 from the wetter Hunuas bush, then traced around screen images as you can see. Comparing the two, *E. aestivalis* is quite distinct with the double layered veins hence a deep groove over the mid-rib but *E. mucronata* has only a single layer of veins so has a shallow central groove. The Column’s specimens differed in some details from Cheeseman’s as noted in the subscripts.

3: *Corybas* alliance round up

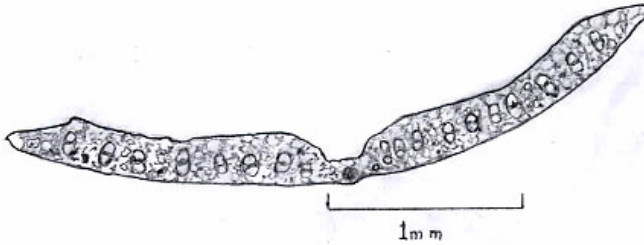


Fig. 5 *Earina aestivalis* leaf section showing thick double layered venation but *smooth* underneath, not with Cheeseman's, "veins conspicuous on the under-surface,"

Fig. 6 *Earina mucronata* leaf section showing single layered venation, "thin but coriaceous, very finely striate." as per Cheeseman.



1. *Nematoceras orbiculata* and *N.* "Sphagnum" are alive and well at Blue Creek in Nelson
2. *N.* "trileaf bract" has a floral bract shaped like its leaf, at Mt. Robert, L. Rotoiti
3. *N.* "darkie" is in good health at Dip Flat, Upper Wairau Valley
4. *N. papillosa* Colenso, a southern relative of *N. macrantha* is at Miner Stream
5. *N.* "round leaf" occurs by the Rainbow Skifield Road, Upper Wairau Valley.
6. a late flowering *N. triloba* taxon by the same road was only in early bud on 21Dec 02,
7. *N.* "Trotters" occurs in Big Bush State Forest ER 49
8. *Singularibas oblongus* alba has colonies at Greymouth and St Arnaud.

1. Blue Creek, Kahurangi National Park, ER 46, has orbicular leaved *Nematoceras* "Sphagnum" (Fig. 7) and *N. orbiculata* growing in several colonies in seepages along

an old gold mine access track. Gordon Sylvester who is researching the colourful history of the area, took the Column, on 26 Nov 02 to the colonies. Along this track, quartz stamper and engine parts still lie rusting, speaking volumes for the heartbreak of a long abandoned enterprise. *N.* "Sphagnum" was Bruce Irwin's tag [J44 p11] for a plentiful taxon he found in Sphagnum moss at the Paramanawera (then Rangataua) Swamp. How did it get to Blue Creek? Most likely it was there originally and colonised the Paramanawera after the clearance of the central N. I. by the last Taupo eruption, about AD 120.

2. Mark Moorhouse took Gordon and the Column to some mossy kanuka bush by Lake Rotoiti, at the foot of Mt Robert on 29 Nov 02 to show off his green *N.* "triloba" with hairs inside and out. It had finished flowering, of

course but more about that from Mark. However, beside our zig-zagging track into *N. "trigreen fuzz"*, was a colony of yet another vexed *N. triloba* taxon, in flower with its floral bract a replica of the leaf! Usually the bract was smaller than the leaf but in some cases, the same size or even larger in one instance. Camera and video gear sprouted all around and it was recorded for posterity. (Fig. 8 & 9) Can we tag it *Nematoceras* "trileafbract"? Note how the dorsal sepal crimps onto the upper lobes of the labellum like a bulldog clip and it too has the labellum lined with hairs.

Gloria and the Column had decided on a holiday tour of the upper South Island including a modicum of orchidising for 3 species not yet in the photo collection. What transpired was a roller coaster orchid hunt through Nelson whenever Mark and/or Gordon were on the scene. It was impossible to complete their agendas in the few days available but results were remarkable as you will see.

3. *Nematoceras* "darkie" (Fig. 10) was sought at the "type" site of Dip Flat on the Upper Wairau, 29 Nov 02. It is definitely dark, just as Graeme Jane and Gael Donaghy said [J71p17]. A little downstream, at Chinamans Stream, whilst Mark was ingeniously shortening his car's burst radiator hose, the Column found a similar but paler taxon in the nearby beech forest. Mark is already working on this one. All will be revealed in a later issue.

4. On a 28 Nov 02 trip up the Hackett and Miner Rivers for two greenhood species (which eluded us!) Mark took us to some white bibbed *Nematoceras papillosa* (Colenso) in Fig. 11. Shock and horror! Subsequent chroniclers have lumped William Colenso's species (then *Corysanthes papillosa*, Trans. NZ Inst, 1884 16: p337) into *N. macrantha* but David Jones et al have now recognised it in their Orchadian 2002 article. Here was the living embodiment of William's text including notably: "petiole ½-2 inches long; peduncle short, 3-4

lines* long, variously situated — springing from near base of long petiole — from the middle — and from the top near leaf," i.e. flower above or below the leaf as seen in other colonies of southern taxa [J70 p38] depending whether the plant is exposed (short petiole) or in deep shade (long petiole). William also had, "Upper sepal . . . projecting far beyond the lip (sometimes 2½ lines), recurved at tip," and "lip . . . papillose within, transparent, much veined; colour, dark purple-red above, whitish spotted with purple-red below;"

Here at Miner R. were colonies of like plants, hundreds of kilometres from the Hawkes Bay type location. Other southern taxa have straight and wider, acute dorsal sepals. All the Column's *N. macrantha* look-alikes have the "Leaf . . . finely and regularly papillose" the character that Colenso ill advisedly chose to distinguish his species. The Column's pics at Miner R. show 2 specimens with the colourless bibs and straight dorsal sepals recurved only at the very tip; just what Colenso said but not what the Column was expecting. *N. macrantha* from the north also exhibits numerous minor variations from site to site so be warned, this brief look at the aggregate is only preliminary.

5. Gordon obtained a key to the Rainbow Skifield gate and gathered a group of enthusiasts, to hunt out *Pterostylis tanypoda*; which was—surprise surprise—disappointingly absent on 21 Dec 02 but the panorama over L. Rotoiti from the top of the ridge was superb on a fine, calm day. Orchid hunters get it all on these all too rare occasions. Down the road however, where it crosses six streams at an S bend, *Nematoceras* "round-leaf" (Fig. 12), albeit with its sparse flowers usually under the leaf, were thriving, especially by the small streams, at 1,200m altitude. The Whakapapa taxon [J63 p12] at the same altitude and flowering at the same time has the flower above the leaf. Mark

* 1 line = 2.0 to 2.1mm according to *Flora II*, 1970 (a twelfth of an inch – Ed.).

sought out *elongated leaves* for flowering plants and thus markedly reduced hunting time. Top marks Mark for this one; it has been staring us all in the face on most of the *Nematoceras* species all this time, why do we have to let a South Islander notice it first? No doubt this is another orchid which blew as seed into the central plateau from Nelson.

6. Further down the road, by a spectacular high waterfall, the Column spotted some *N. triloba* leaves which had Mark on the precipitous scene pronto, looking of course, for elongated leaves. Sure enough, there were bumps down those stems indicating, as we thought, aborted flowers but no, these proved to be early flower buds! on 21 Dec 02? That has to be the latest of the late. One had tepals just starting to uncurl. The Column looked up at Mark, the undisputed leader in *N. triloba* agg. in Nelson; he stood there just shaking his head in disbelief at yet another clear taxon in this multivariate aggregate. Neither Gordon nor Mark have been able to get back to check flower forms; next year perhaps.

7. *N. "Trotters"* (Fig. 13) had several still recognisable flowers at Big Bush State Forest where Mark had previously spotted it. The lateness of the season on 22 Dec 02 meant that survivors were a bit bug eaten but unmistakable in a gully off Station Creek, a tributary of the Buller in ER 49.

8. Harking back a little, the hospitality at Sherry River, Nelson had been the best, thank you Gordon and Cherry, but the orchid pace

had got too hot so Gloria and the Column headed down the Buller to Greymouth for some R & R. The HT line track above the substation looked a good place to get a view over the town on 1 Dec 02, another rare calm day. But there, by a mountain-biker's track leading off to a knoll just happened to be a colony of an hypochromic (albino) *Singularybas oblongus* (Fig. 14). But its mouth is a horizontal oval, indicating maturity, none of the leaves had the reddish veins apparent in the Clevedon colony (Fig. 15) which has a vertical oval mouth; not a good identifier. Better are the undulate leaf margins and a lack of the bed of dentiform calli on the disc (or labellum floor).

9. Rejoining the Gordon/Mark roller coaster, at Dennis Meade's bach, St Arnaud, at 640m altitude, another white *S. oblongus alba*" (Fig. 16) at the road frontage took centre stage on 20 Dec 02. This has the ragged fringe of short irregular spikes, typical of *S. "aestivalis"* [J77 p15] elsewhere in NZ but the all important bed of prickles on the disc was absent! The fringe spikes, can be flat it seems — so they look ragged — or in-rolled at the margins, giving that needle-like appearance. Not a lot of difference in fact. Various flowers in the Clevedon colony show this trait and caused some serious rethinking. Note that red is apparent in the leaf, floral bract and the pedicel of most so they are not albinos, just a white form of flower.

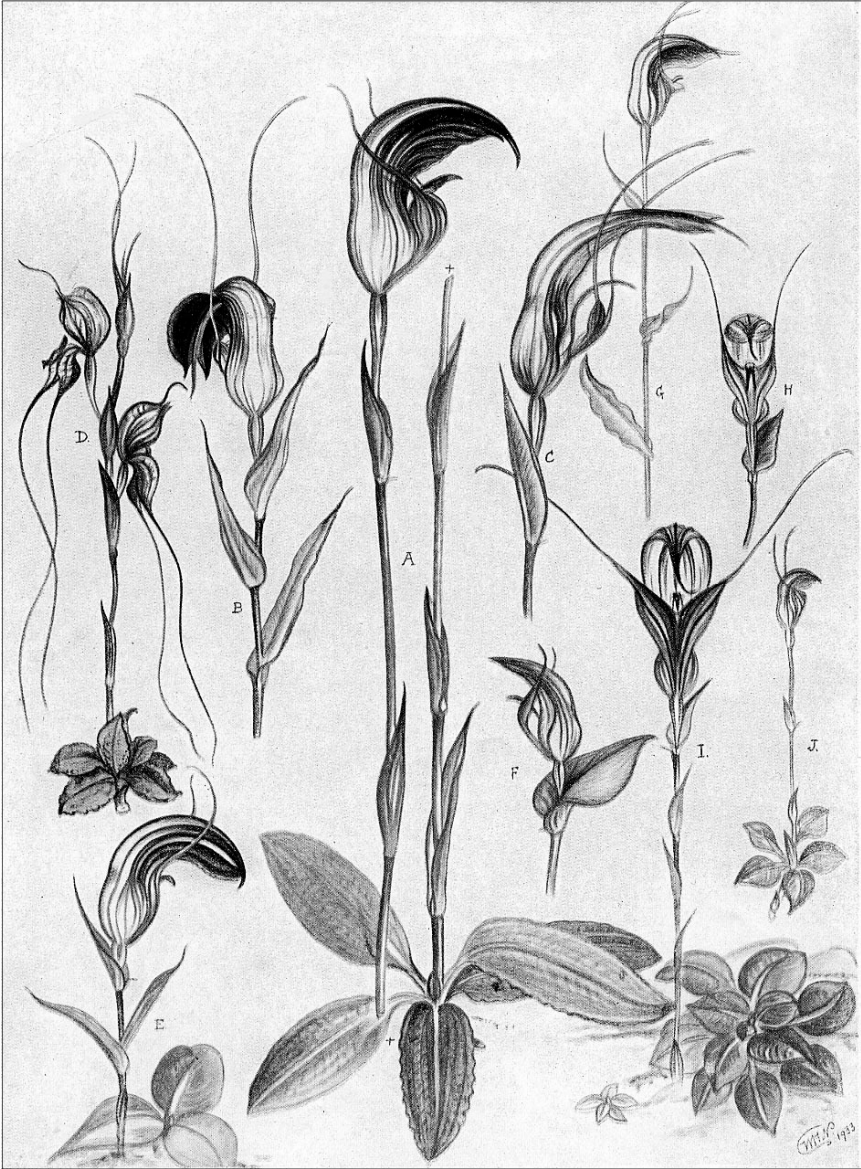
NZNOG needs a treasurer

The NZ Native Orchid Group seeks a person prepared to act as its treasurer. The work involves keeping a list of all members and other journal recipients with their subscription status, sending out subscription notices each year, banking, writing cheques:

an ability to use the mailmerge function of Microsoft Word would be an advantage.

Please respond to Ian St George, Convenor, 22 Orchard St, Wadestown, Wellington, ph. 4994227 or email istge@rnzocgp.org.nz

close relations: orchids like ours



“GREENHOODS” watercolour by WH Nicholls, 1933,
from Barrett C. *Gems of the bush*. Sun Nature Book 5, Melbourne, 1934.

These are now A: *Pterostylis baptistii*, B: *Diplodium grandiflorum*, C: *Pterostylis falcata*,
D: *Oligochaetochilus woollsi*, E: *Diplodium truncatum*, F: *Pterostylis foliata*, G: *Diplodium obtusum*, H:
Taurantha ophioglossa, I: *Diplodium revolutum*, J: *Linguella nana*.

William Colenso describes Gastrodia leucopetala

From Trans. N.Z. Institute 1886; 18: 268.

Gastrodia leucopetala Col., sp. nov.

Root a long sub-cylindrical greyish-flesh-coloured pubescent tuber, encircled throughout with several rows or rings of scarious long light-brown ovate-acuminate scales, the rows being pretty regular and close together, of about 5 rows to 1 inch, somewhat resembling the sheaths on the stem of some species of *Equisetum*. Stem 2ft.-2 ft. 9in. high, erect, sub-succulent, stout, 3 lines diameter and cylindrical below, sub-angular at top, smooth, light-brown with short purplish stripes; 8-9 bracts, perfoliate, membranaceous, distant, on lower part of stem, margins entire, dark purplish-brown, spotted with light-coloured spots much like perianth. Flowers 20-40 at top of stem in a raceme 10-15 inches long, pendulous, rather distant, scattered, pedicelled; pedicels 2½-4 lines long, each with a single sessile bracteole at base 2-2½ lines long, 1 line broad, ovate-acuminate, sub-scarious, reflexed, coloured like those of lower stem but darker. Perianth thickish, papillose, dark brownish-green spotted with large light-(sub-fawn-) coloured spots without, whitish within, ventricose at base, anterior portion much curved upwards, 6-7 lines long excluding ovary, mouth open, 4½ lines diameter, quinquefid; segments spreading, veined, veins branching at tips, margins crenulate; two lateral sepals largest, deltoid, subacute and recurved; upper sepal oblong, obtuse and emarginate; two lateral petals pure white, adnate, projecting from just within perianth tube, linear-oblong, concave, tips truncate and retuse, margins thickened, slightly crenulate, and recurved; labellum white, 3-nerved, disc contracted below the middle, the anterior portion sub-rhomboidal with two reddish, longitudinal ridges, their margins thickly crenulate-fimbriate, rising divergent from the middle and united towards tip, but not joined to it; tip produced, thickened, recurved, verrucose and dark-brown at apex; anterior margins of disc finely crenulate — waved and incurved, the middle margins plain and spreading, posterior margins thickened, largely raised, waved and incurved; claw plain and grooved; ovary thick, ovoid, coloured as perianth, at first 3-4 lines long, after flowering twice that size.

Hab. In dark forests on the eastern slopes of the Ruahine mountain range, 1850-52; and in similar spots in the Seventy-mile Bush, between Norsewood and Danneverke, County of Waipawa, 1884-85; *W.C.*

Obs. I. I have long known this plant, (for upwards of thirty years,) but have never obtained good flowering specimens until this summer (January, 1885). I had, however, always suspected it to be a distinct species from the known endemic one (*G. cunninghamii* Hook. fil.), although the specimens I had detected in the woods in autumn travelling were always long past flowering. Having again met with it in those woods near Norsewood in April, 1884 — but, as before, too late — I marked those spots, and in visiting them again in January, 1885, (almost purposely,) I was rewarded with finding a few in flower on the top of two racemes, not, however, as many as I could wish, and in localities some miles apart. It now appears that the lowermost

perianths on their long raceme expand first, and so regularly proceed up the stalk, like many other flowers produced in racemes and spikes. Having obtained, after all, only a very small number of really good flowers, (though plenty of both unopened and withered ones,) and being very desirous of sending them preserved in spirits to Kew, I have only dissected *one* perfect flower. Of this I have given a very minute description, in the hope of its being compared by some one of our working botanists with *G. cunninghamii*, which, I fear, is daily becoming more scarce.

Obs. II. I believe this plant to be very distinct from the other long-known New Zealand species, but, unfortunately, I have no specimens of that species left for comparison, and the description of it in our botanical books is neither complete nor minute. The pure white petals of this species are a most striking object when fresh and in its dark habitat; its lip, too, is widely different from that of *G. cunninghamii* (viz., the description of it given in our books of the New Zealand Flora); indeed, its lip is more like that of the Australian species, *G. sesamoides*, Br., though the perianth differs considerably. Of this species a fine drawing with dissections and description, is given in the "Flora Tasmaniae" (Bot. Antarctic Voyage, vol, vi.).

From Bush jottings: No. 2 (Botanical), Trans. N.Z. Institute 1892; 25: 308

Of an orchid, *Gastrodia leucopetala*, Col. In another part of the same wood (near Dannevirke) I was much pleased on finding no less than eleven specimens of this (now rare) terrestrial orchid, all growing together within a small semi-enclosed spot of about 2ft. in diameter; and just beyond were two more. This was at the end of January, and of course they were all past flowering, as this curious plant flowers about Christmas; their upright reed-like stems were nearly alike in size, each being about 2½ ft. high, and full-flowered. The eleven specimens were growing close to the base of a large living rimu tree (*Dacrydium cupressinum*), and nearly surrounded by its high and naked roots, projecting like ridges from its trunk, which no doubt had been the means of preserving the roots of these plants, which are tolerably large and fleshy and are edible both by man (the old Maoris) and pigs. In fact, I have long been of opinion that the main cause of this orchid now being so rarely met with in its forest habitat is owing to its root being eagerly sought after and eaten by the wild pigs.

Cheeseman included G. leucopetala in G. cunninghamii in his 1906 Handbook. Earlier, in 1884, Colenso had written to Cheeseman about the latter's not accepting Colenso's new species,

"Of one thing I am pretty certain, that if you *knew* these plants I have laboured to describe, you would, I think, alter your judgement concerning, at least, some of them: and further, that even in those instances in which I may be wrong (although I am not conscious of *any*), I shall not have laboured in vain, because I have brought forward in every case certain characters that had *not* been noticed in the descriptions originally given of the species to which such may belong, and therefore will be of service to working Botanists in amending their specific descriptions thereafter.... Continue to make what remarks you please of my work—it shan't break squares between us: only, don't use a rusty lancer."

In the light of today's sophisticated taxonomy, Colenso has repeatedly been proved right—Ed.

Seasons in the life of some Canadian orchids:

Part 3 - Canadian nectariferous orchids - Platanthera

Nectar production is the oft-cited reward mechanism which some orchids use to encourage pollinator visitation but not all orchids produce nectar. Some rely instead on mimicry of other nectar-producing flowers or on sexual deceit or both. Perhaps the largest group of Canadian orchids that produce nectar is of the genus *Platanthera*, an assemblage of some 15 species in Canada including the Tall Leafy White Orchid (*P. dilatata*), the Little Club-Spur Orchid (*P. clavellata*), Hooker's Orchid (*P. hookeri*), the Tall Leafy Green Orchid, (*P. hyperborea*), and the Eastern Prairie Fringed Orchid (*P. leucophaea*). All *Platanthera* species are terrestrial orchids having conical fleshy roots, resupinate flowers with distinct but variable length spurs. The spur is a lip extension which serves both to secrete and store sugary nectar. Flower colour ranges from pure white through various shades

of pink and purple to yellowish green and green. Most species of *Platanthera* are insect-pollinated. Some species such as *P. clavellata* (Fig. 1) are self-pollinating but also produce nectar which may be evidence of a species having recently lost its pollinator.

Platanthera hookeri is a long-lived, spring-blooming orchid having yellowish-green flowers. Plants have two glossy rounded leaves which typically lie flat on a bed of fallen tree leaves. One rarely encounters more than a few plants at any one location throughout the range from Manitoba east to Nova Scotia. Despite the tantalizing nectar reward presented in the floral spurs, pollinators are not always present where the plants grow or when they bloom (Fig. 2). In some localities, flowers are rarely if ever pollinated while in other habitats, flowers are regularly visited by pollinators and seeds are



Fig. 1. Inflorescence of *P. clavellata* showing nectar in spur.

Fig. 2. *P. hookeri*

Fig. 3. Self-pollinating flowers of *P. hyperborea* have short nectarless spurs. Lip has been removed to show how the pollinia fall onto the stigma.

formed. The pollinator population seems to be either absent, low or sporadic in distribution.

Self-pollinating mechanisms have evolved spontaneously with some species where pollinators are no longer present. In self-pollinating *P. hyperborea*, the nectary is short and nectarless. Insects do not visit the flowers of this widespread boreal orchid. When the nectarless and self-pollinating habits emerged is unknown. The pollinia swell as they absorb moisture from the air. The swollen structures pop out of the anther to fall onto the stigma, frequently before the flower has opened fully (Fig. 3).

When lepidopteran (moth or butterfly) pollinators visit nectariferous *Platanthera* blooms, the pollen-bearing structures (pollinia) become variously attached as the insect probes for nectar. Pollinia adhere to the base of the proboscis (tongue), the head, eyes or even the legs by means of a sticky disk called the viscidium. In many orchid species, the size and shape of a particular pollinator is such that attached pollinia are perfectly positioned for stigma placement if and when the insect visits a second bloom. As the pollinators move from flower to flower in search of nectar, the pollen masses brush against the sticky stigma when some or all of the pollen is deposited.

Platanthera pollen is arranged in blocks of 4 grains (tetrads) compressed into wedge-shaped structures called massulae (Fig. 4). Each pollinium contains some 20 to 200 massulae each consisting of some 100 germinable pollen units. Theoretically, pollen removed from one flower could be deposited on many other blooms. Four hawkmoth species (Sphingidae) are known to pollinate the night-fragrant Eastern Prairie Fringed Orchid (*P. leucophaea*) (Fig. 5). The pollinia stick to the base of the moth tongue which is the ideal position for pollen transfer with this species. The moth-orchid match is optimal. Fruit set is often high with this wetland species (Fig. 6). The Western Prairie Fringed Orchid (*P. praeclara*), which superficially resembles the eastern species, is rare. Its Tall Grass Prairie habitat has been historically exploited for agriculture such that only a few reserves now remain in Manitoba and in the adjacent United States. Two different moth pollinators have been reported. The pollinia stick to various parts of the moth head and eyes. With pollinia in this position, these moths are less likely to deposit pollen efficiently and so fruit and seed production is modest. The orchids produce nectar and are visited by pollinators

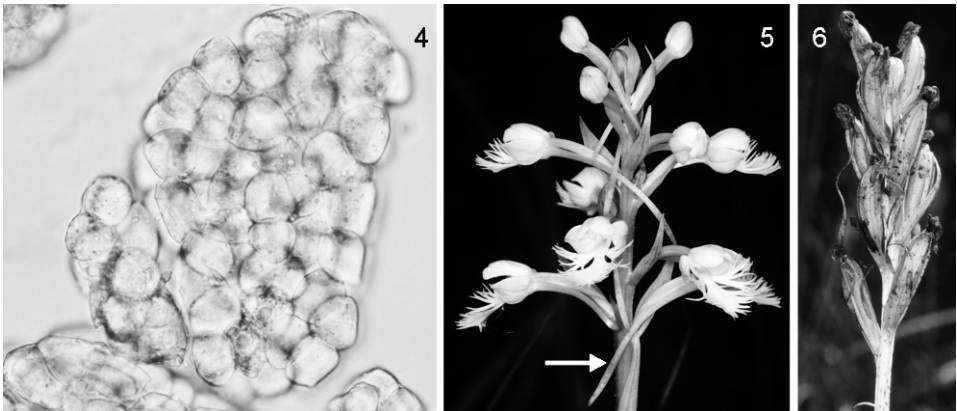


Fig. 4. Pollen of *Platanthera* sp. is packed into structures called massulae.

Photo by Marilyn Light

Fig. 5. Inflorescence of *P. leucophaea*. Arrow points to nectar level in spur.

Fig. 6. The many full capsules of *P. leucophaea* arise from adequate pollinator activity and efficiency.

but the match is not quite perfect. Should conservationists worry about this mismatch and hand-pollinate to achieve higher fruit set?

One might assume that nectar reward would result in enhanced fruit and seed production if pollinators were not limiting but such assumptions may be unfounded. In an intriguing European study which compared fruit set of nectariferous

Platanthera bifolia with that of nectarless *Dactylorhiza incarnata*, Mattila and Kuitunen (2000)

reported that under conditions of hand pollination and supplemental plant feeding (fertilizer application), the major difference between these orchids was with their use of resources. There is a cost to nectar production and a feedback mechanism by which nectariferous *P. bifolia* balances fruit set with existing reserves. This orchid had a lower fruit set to flower ratio even after hand-pollination. The nectarless *D. incarnata* set more fruits with hand pollination but was less likely to flower the following year even if supplemental fertilizer was provided. More study is needed to learn if the resource-use mechanisms are widespread but this finding is sufficient to caution conservationists seeking to increase fruit set through hand pollination. Consider the longer term consequences of such actions.

The Tall Leafy White Orchid (*P. dilatata*) is widespread across Canada. It is found growing in fens, roadside ditches and seepage slopes. A



Fig. 7. Flowers of *P. dilatata* are moth-pollinated. Lip has been removed to show 19 massulae on the stigma representing approximately 2000 pollen grains.

Fig. 8. A closeup of the stigma area in Fig. 7. The arrow points to one of several body scales left behind by the moth visitor.

All photographs by Michael MacConaill unless otherwise indicated.

human visitor can appreciate the wonderful spicy vanilla fragrance which is enhanced at dusk. After dusk moth pollinators mob the flowers, efficiently pollinating many of them. Evidence of their visits can be seen in the many moth body scales adhering to the stigma and surround. The massulae can easily be counted and the pollen deposit thus estimated for later study of seed set (**Fig. 7, 8**).

Nectar production is a useful reward mechanism by which orchids such as *Platanthera* can achieve reproductive success but it clearly is not the only useful contrivance that has evolved. The few examples discussed in this paper demonstrate that there is still a lot to be learned from these and other orchids.

References

- Mattila, E. and M.T. Kuitunen. 2000. Nutrient versus pollination limitation in *Platanthera bifolia* and *Dactylorhiza incarnata* (Orchidaceae). *Oikos* 89 (2): 360-366.

East Meets West

by Mike Duncan

- abridged from the Bulletin of the Western Australian Native Orchid Study and Conservation Group March 2003.

I've recently managed to convince the local conservation department to fund me to do some work on orchids. That's right, I'm on a 6 month "paid holiday" from my forest research job preparing a recovery plan for 15 threatened Victorian orchids. I've tried to convince my workmates that spending last spring rushing around the state visiting and assessing orchid populations for work and play has made every day a work day (rather than a holiday), but they were never going to believe me.

A recovery plan sets out the actions necessary to support the recovery of critically endangered species to maximise their chances of long-term survival. In fact, most of the taxa I'm working on are so rare that they don't even have a name. They are known as "sp. aff." this or that, and many are "one site wonders". There's the spider orchid that's known from only 4 plants (3 apparently sterile) on a farmer's property in northeast Victoria, the November-flowering ridge orchid from the Otway Ranges; and the rufa greenhood (*P. cheraphila*), known from a few thousand plants, but restricted to just a short stretch of the Wimmera River floodplain near Horsham. However, I thought one taxon might be of particular interest as it appears to be the only Victorian population of a mostly Western Australian genus.

Paracaleana (sp. aff.) *nigrita* is known from a single population of approximately 30 plants near the Grampians NP in Victoria. As luck would have it the site is a private property bush block, surrounded by the national park rather than within it, which makes management that bit more difficult. It's also less than 50 m from one of the major roads in the park. *P.* (sp. aff.) *nigrita* favours open relatively bare areas between shrubs or in mossbeds associated with the base of trees. ... Although the same

vegetation is relatively widespread in the Grampians NP, no other populations have been reported. The Grampians population occurs over a very small area (only 20 m by 10 m), and appears to be relatively stable, with 20-30 plants producing a leaf each year since its discovery in 1992. This population is thus very susceptible to "natural disaster". As an example, the stems of 4 of the 8 flowering plants in 2001 were broken by a small dead branch, which fell from an overhanging tree. This single event robbed the population of half its potential seed set for the year. As a result, caging and fencing of the site has been identified as a priority in the recovery plan.

P. (sp. aff.) *nigrita* produces a single, flat, ovate leaf in response to autumn and early winter rains. A single flower is then produced on a short, wiry stem (up to 10 cm) in November. The flowers are reddish-brown, with the narrow-ovate labellum having a covering of shiny calli confined to apical third. The flowers are quite distinct from those of *P. minor*, which is common and widespread in eastern Australia.

Although it is much closer to *P. nigrita* and the other WA members of this genus, *P.* (sp. aff.) *nigrita* can be readily distinguished by its ovate shaped leaf, and labellum which lacks the central hump, and only the apical third is covered with calli. While the Grampians is the only known population in Victoria, there are records of a very similar taxon from 2 sites in South Australia (Ashbourne and Kangaroo Island). Evidently the Kangaroo Island population has not been seen for a number of years, but 3 plants were recently seen at Ashbourne. This year, despite the worsening drought, 24 plants flowered in the Grampians population, and a single specimen was collected and sent to Andrew Brown for identification and comparison with WA species. ... Wouldn't it be great if it turned out to be a new species with a distribution from eastern Western Australia through South Australia, to western Victoria!

Gary Pennial wrote, "In August and again in November 2002 Margaret Menzies, Glyn Wren and I travelled to Te Paki on orchid trips and here is what we saw."

(Photographs page 25).

August trip

I had not previously seen *Thelymitra matthewsii* or *Anzybas rotundifolius* in flower and these were the main targets although we expected to be too late in season to see the latter.

Early on morning of 26 August the three of us left Urenui en-route to Te Paki. First stop was Bream Tail Reserve where we found *Pterostylis graminea* in flower and many more in bud; *Diplodium trullifolium* numerous and lots in flower; *Thelymitra carnea* small and only just starting flower spikes; various other *Thelymitra* species; *Acianthus sinclairii* numerous – many seed capsules; *Corybas cheesemanii* – some seed capsules.

Unfortunately the weather was not good with showers on and off all day and grey skies and so we decided to go directly to Te Paki without any more orchiding.

Next morning (27 August) dawned fine and clear and after breakfast we decided to hit the Shenstone Block. Our first stop was where we thought the *Singularybas "aestivalis"* colony was but we were unable to locate it and thought it had become overgrown since we were last there. We discovered in November that the widened track had disorientated us and we weren't actually far enough along it. However, to compensate we found numerous *Cyrtostylis oblonga* in flower and had a busy time photographing these.

The next stop a short distance up the track was in the area where *Anzybas rotundifolius* leaves and *Molloybas cryptanthus* seed capsules had been observed on previous trips. Numerous *Anzybas* leaves and seed capsules were immediately spotted but a prolonged unsuccessful search had us despairing of finding a flower. We were about to give up when Glyn gave a cooee on finding a flower in

full bloom partially concealed in leaf litter. It was the first I had ever seen and a beautiful deep pink. After numerous photos we decided to move on and look for *Molloybas cryptanthus*.

Hooray! More success with the unearthing of two fine specimens and another photography session. Also found were numerous *Petalochilus*, *Microtis* and some *Orthoceras* but none in flower.

Feeling very pleased with ourselves we then decided to go up Cheesemanii track and then to Prime Site to look for *Thelymitra matthewsii*.

While travelling up track we were startled by a wild pig crashing through the undergrowth just ahead of us. While I was investigating this Margaret called out that she and Glyn had found another colony of *Anzybas rotundifolius* under a pine tree but that there didn't appear to be any flowers. I decided to go back and see the position of the colony for future reference and almost immediately spotted a lovely pale pink translucent flower. A completely different colour from the previous one. Much jubilation and another photography session.

Our next stop was a small promising looking clay pan half way up to Prime Site, where Margaret almost immediately spotted two *T. matthewsii* corkscrew leaves, both with flower buds showing signs of being close to opening. A search of the rest of the pan turned up another three corkscrews and two more flower buds. Margaret said this pan had been searched in previous years and no *T. matthewsii* has been observed there.

Feeling very hopeful we proceeded up trail to Prime Site and saw some of Anne Fraser's survey pegs in a group of *T. matthewsii*. A whoopee! of delight had me speeding in that direction where Margaret had discovered a beautiful *T. matthewsii* in full flower with pollinia still undropped.

During the course of the day we found another six flowers fully open (mostly in bluer

shades, but some quite pinkish). Also numerous other developed flower buds, many close to opening. All in all we estimated we saw over one hundred plants counting the smallest little corkscrews to mature flowering plants. We seemed to have picked the perfect day to visit.

Satisfied with our first day's search we returned to the shearers' quarters for a huge dinner and well-earned sleep.

Day two found us at Rubbish Dump Hill, which proved a disappointment. We found only two previously observed *T. matthewsii* colonies and no flowers. Many *Plumatichilos tasmanicus* plants found on other side of ridge (West Side?) and quite a lot of flower buds but no actual flowers. Also some *T. aff longifolia* in flower, heaps of *Acianthus* leaves and seed capsules, *Microtis* species, *Thelymitra* species and *Orthoceras*.

Day three and back to the Shenstone Block. This time up track to Friday Hill and beyond and then back down the Pink Track. Dozens more *T. matthewsii* in flower, some with pollinia in place and others dropped. *Thelymitra matthewsii* in numbers I had never dreamed of seeing. We obviously had struck just the perfect days to visit.

More *Plumatichilos tasmanicus* rosettes were found but no flowers. Also more *Cyrtostylis oblonga*, *Thelymitra* species, *Anzybas rotundifolius* leaves, *Diplodium alobulum* leaves, and *Corunastylis* species (no flowers), *Microtis* species (no flowers) and *Petalochilus* species (no flowers).

Day four. Kauri Block via Pandora Track. Along track on climb up from road numerous *D. alobulum* in flower, *Orthoceras* leaves, *Acianthus sinclairii* leaves and seed capsules, *Petalochilus* species leaves, *Thelymitra* species leaves. On small bare area on right of track just before turn off to Kauri Block, Margaret found a good colony of *Anzybas rotundifolius* (no flowers).

On proceeding down into Kauri Block we found numerous *Pterostylis agathicola* in

flower, *D. alobulum* in flower, *D. trullifolium* in flower and *Cyrtostylis oblonga* with one twin headed albino which proved to be draped with cobwebs when photos developed. On return to shearers' quarters we decided to go up to Prime Site for one last quick look at *T. matthewsii*.

Next morning a marathon trek home via Rawene ferry arriving back at Urenui after 8pm.

November trip to Te Paki

Monday 4 November Margaret Menzies, Glyn Wren and I piled into Margaret's car after lunch and started our second trip for the year from Taranaki to Te Paki. After our successful trip in August we were hopeful of repeating the performance with the later flowering *Thelymitra*, *Cryptostylis subulata* and *Nematoceras rivularis*.

After a brief visit to say hello to Eric and Gloria Scanlen at Papakura we were on our way to Allan and Colleen Ducker's orchid ranch at Silverdale where we spent the night. It was lovely to see the progress Allan and Colleen have made with their new property and the rapidly evolving orchid environment, which Allan is creating. Lots of orchids of various types already thriving.

Next morning we were on our way to Bream Tail Reserve. Another overcast day and not as warm as we would have liked for *Thelymitra* to open. As expected all *T. aemula* in bud, none open, also other *Thelymitra* species unknown. Lots of normal *Pterostylis graminea* in flower. Also *P. graminea*? (plant and flower normal size but leaves much shorter than usual with flowers overtopping them). In addition to these were tiny little short plants, approximately eight to ten centimetres in height with very short stumpy erect leaves but to all appearance *P. graminea* flowers. These miniatures had us scratching our heads but on observing photos of them the consensus of opinion among Eric S, Allan Ducker and Bruce Irwin was that they were just variations of *P. graminea*. Also seen were numerous



Pterostylis graminea
variations at Bream Tail Reserve

Diploidium trullifolium (finished flowering); some *Corybas cheesemanii* and seed capsules; also leaves of *Anzybas*; *Petalochilus chlorostylus* in flower; leaves and buds of *Petalochilus* species unknown.

Next stop was at Hewett's Reserve with weather rapidly packing up and starting to drizzle lightly. This necessitated a quick gallop up and down the track but was enough to interest me in a future visit in better weather. Spotted on the track in flower were numerous *Petalochilus chlorostylus*, one very small pink, red stemmed *Petalochilus* (aff. *fuscata* like) numerous *Thelymitra* species, none in flower. *Nematoceras trilobus* (leaves only).

We decided to push on to Waitiki landing where we arrived at about 8.30 pm.

Next morning, after breakfast we were on the road to the Sod Wall Track. After travelling past the Surville Cliffs turnoff we discovered we had gone too far but decided to go down to Spirits Bay for a look anyway. It was a glorious morning and a lovely spot to visit but not very productive from an orchid point of view. After a paddle in the sea we started back towards Sod Wall Track.

About ½ a kilometre from Spirits Bay we decided to check out a stand of likely looking Manuka at left of roadside. On the roadside were *Microtis parviflora* (some in flower), *Gastrodia* species (no flowers). In the scrub were *Corybas cheesemanii* seed capsules, *Petalochilus chorostylus* (in flower) and one group of *Thelymitra* with blue buds not far from opening. On Margaret's prompting I opened one of *Thelymitra* buds to check the column and was pleased and surprised to find column arms with no cilia and top of column with huge cleft in it. (*Thelymitra sanscilia*). We checked another plant with same result and decided to return later when hopefully a flower would be open for us to photograph.

Back in the car and off to Sod Wall Track which we spotted this time. We were quite disappointed with the track and could find no sign of any *Calochilus herbaceus* which we had hoped to see – albino or otherwise. Numerous

Petalochilus (all finished flowering); *T. carnea* (all finished flowering). Before getting to the Sod Wall we decided to return to the car as we felt we were wasting our time.

On return as day was heating up I spotted a flash of blue to right of path and there was an open *T. aemula*. O joy, more photographing opportunities. A little further down the track and Glyn found another with wide-open tepals that were almost bent backwards. The best part of a film later and we were satisfied that we should have some good photos – alas, mine proved to be poor and partially underexposed. I seem to have more trouble with *T. aemula* than any other colour.

Half way back to the car and I decided to check out a track which diverged off to the right and up over a ridge on the horizon. The start of the track is almost invisible but after ten minutes of scrub bashing I finally located it. For the first several 100 metres it was quite overgrown but then opened out nicely. On the first knoll and over the crest there were *Thelymitra aemula* in flower and hundreds of *Petalochilus* plants (all finished flowering). Well worth checking out earlier in season. The track peters out after only about 1.5 kilometres.

Next stop was the Pylon Track where Allan Ducker and I found huge *Thelymitra* “darkie” plants on 26 Oct 01. After proceeding a couple of hundred metres up the track Margaret spotted a *Calochilus herbaceus* in flower. Glyn and I also found some and altogether eight in flower were sighted. Also seen were a few *T. aff. longifolia* still in flower, *T. carnea* all well finished, *T. pauciflora* in bud, *Microtis* species (all finished). One only *Molloybas cryptanthus* seed capsule and one *Petalochilus bartlettii* in flower.

Proceeding up old fenceline beside track we then found a *T. “roughleaf”* with two open pale pink flowers with strange white and brown mottling. Quite a bit of excitement for a while until we began to suspect that mottling was either the result of a virus disease or mites or other nasties. Regardless of this we took photographs.

Next, more *T. “roughleaf”* flowers just opening and a beautiful deep mauve colour. These were encouraged to open more fully with some gentle blowing and were quite cooperative. The *Thelymitra* “darkie”s of the previous year were only a shadow of their former selves. Half the size and most finished flowering. There were only a few partially opened flower buds left and these also had to be coaxed fully open for photographs. Not as successful unfortunately and a little bruising caused. Also seen in Manuka beside track *T. “sky”* with buds unopen and one *T. “sky”* spotted by Glyn in more open area in full flower, and *T. aemula* in flower. Overall we were delighted with this track which was much more productive than the Sod Wall.

7 November: up bright and early and into the Shenstone Block. First of all we located the *Singularybas “aestivalis”* colony which we had been unable to find in August but which Eric S. has assured us was still there. Sure enough, there it was but a bit further up the track than our faulty memories had led us to believe. Lots of seed capsules were present which augers well for future.

Also further along the track were hundreds of *Molloybas cryptanthus* and numerous *Corybas cheesemanii* seed capsules. *T. carnea* all well finished, *T. aemula* in bud, possible *T. tholiformis* in bud. *T. sanscilia* in bud (these were checked and like Spirit Bay plants they all had a few cilia on column arms). Numerous *Anzybas rotundifolius* (some seed capsules), *Corunastylis* species – finished, *T. aff. longifolia* (a few still in flower), *Petalochilus aff. fuscata* – some still in flower, *Petalochilus chlorostylus* – some still in flower.

One brilliant deep pink *Petalochilus* spotted by Margaret with red labellum disc was the most colourful *Petalochilus* we had seen. The red bars in labellum disc almost ran together and presented a striking appearance.

8 November: our last day at Te Paki and we returned to Pylon Track and checked out the roadsides which had mainly *Microtis* species and *Petalochilus* species.

We then went back to Spirits Bay and were disappointed to find the *Thelymitra* buds were still unopen although looking as though they would open if it were a little warmer. Determined not to be thwarted I managed to blow and hand open three flowers which were slightly bruised in the process. However better than no photos.

9 November: next day and we were on the road bright and early with Barbara Hoggard's at Kaiaumau our destination.

After a stop at the Gumdiggers Park to ask for directions and a look around the old diggings and reconstructed village we were on our way to Barbara's. To save being an inconvenience we took our own packed lunches with us so that we could eat and have a cuppa before proceeding into the swamp. Barbara who was pleased to see us and a bit disappointed that few Orchid Group members call in these days made us most welcome. They really should, as the swamp is definitely a prime orchid site, easy of access and well worth the slight detour.

After a nice chat with Barbara who we found fit and well, we made for the swamp where we found one of our target species, *Thelymitra malvina* mostly finished but a few

still in flower. We took some photos of these but were disappointed that the *Cryptostylis subulata* plants were still only in bud and no flowers. Also seen were *T. aemula*, *T. pauciflora*, *T. longifolia* and other *Thelymitra* species.

Our next stop was Lake Ohia where the lake level was back to normal again. Here all the *T. malvina*, which were few compared to numbers spotted in 2000 visit were all well finished flowering. Margaret's eagle eye, however, soon spotted a *Cryptostylis subulata* in flower on a Kauri stump and we then found another four plants in flower and about 20+ young plants. Also found several *T. pulchella* in flower and *Petalochilus* and *Microtis* species (leaves only) in manuka.

Final stop of the day was the Kaeo Quarry where I decided to have a quick look to see if any *Nematoceras rivularis* plants in flower. A quick dash up the ridge and down into the gully and I was rewarded with the sight of dozens of open flowers on the creek bank. Well worth the effort and finally some decent *N. rivularis* photos.

Well satisfied with our trip we then proceeded to Papakura to the Scanlens' hospitality and next morning home to Taranaki.

OUR COVER ARTIST

Dorothy Jenkin was born Dorothy Venning in 1892 in London. She attended the Royal College of Art before and during World War I, and took a special interest in floral art. She and fellow student Thomas Hugh Jenkin ARCA were married in 1918. They came to New Zealand in 1922, with family, and took up a position at the Dunedin Art School; there were commissions for work in Dunedin, and they exhibited at the Dunedin and South Seas Exhibition in 1925.

In 1930 they moved to Invercargill where Mr Jenkin became head of the Art Department at the Technical College. From the late nineteen-thirties Dorothy Jenkin taught art at Southland Girls' High School and Gore High School. She was a foundation member of the Invercargill Art Society and exhibited often there; still lifes were a specialty. She was fully involved in the acquisition of Anderson Park as Invercargill's Art Gallery.

In retirement in 1952 she moved to Stewart Island, and so began her interest in native orchids and fungi. During the nineteen-sixties she produced a series of watercolours of these for the Rakiura Museum, and the Museum has made prints available to the public. With failing sight she stopped painting only in the 1980s, when she lived in a magnificent bush and garden setting on the Island.

Her paintings are skilful, delicate illustrations, the prints much sought after by visitors. Among them are two paintings of *Gastrodia cunninghamii*.



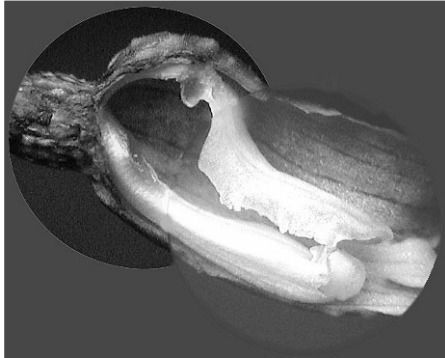
Gary Pennial's (pp 20-24) Northland orchids: 1—*Thelymitra matthewsii*; 2—*Petalochilus bartlettii*; 3—*Anzybas rotundifolius*; 4—*Calochilus herbaceus*; 5—*Petalochilus* aff. *fuscatus*; 6—*Cyrtostylus oblongus*; 7—*Thelymitra* "darkie"; 8—*Cryptostylis subulata*; 9—*Nematoceras rivularis*; 10—*Thelymitra* "roughleaf"; 11—*Thelymitra aemula*; 12—*Thelymitra malvina*; 13—*Thelymitra* "I"sky".



Kelly Rennell (p27): *Gastrodia* from Southland: 1-3 Lake Hauroko; 4-6 Stewart Island.
*Are these the same species? Is one of them Colenso's *G. leucopetala*? - Ed.*

notes, letters, news, views, comments

Kelly Rennell (Invercargill) and Sid Smithies (Otautau) sent a CD and some interesting emails on *Gastrodia* (among other orchids) they had seen in the far south. Most interesting was a *G. cunninghamii* of an overall light fawn colour, with a rather different-looking flower, its labellum slender, upcurved and not black-tipped (*photographs page 26*). Their second find was a *G.* "long column" (16 February): "Found many *Gastrodia* today. About 100 plants in a quarter acre. One I measured was 820mm high with 60 flowers. Growing in a damp area under mostly *Lawsoniana* type conifers. Area has had pine trees cut from it in the past. Plants have a slight scent. The further under the trees the taller the plants but all mature plants at least 500mm high with many flowers."



Gastrodia "long column" from Southland (photos Kelly Rennell).

Top: column; **L:** labellum; **R:** column and labellum. See colour photos opposite too.

Max Gibbs wrote, "Our librarian Joke Baars gave me this report based on a colour photo ID from one of her botanical books: 'We found *Danhatchia* on 29 January on the track up Mt. Maungakawa in the Te Tapui reserve'" – near Matamata – Ed.

Pat Enright showed me an interesting paper (Duguid F. Botany of the northern Horowhenua. NZ J Bot 1990; 28: Orchidaceae pp403-405). She listed what we now know as *Acianthus sinclairii*, *Adelopetalum tuberculatum*, *Chiloglottis*

CONTINUED ON PAGE 29...

Let us keep our feet on the ground

By Bruce Irwin, Tauranga.

Recently I have had time to read NOG Journals in a more leisurely and careful way than when they first arrived, and have been disturbed by instances of inconsequential differences being cited as evidence of a possible new taxon.

Almost every member of the Native Orchid Group hopes that one day they will find an unnamed orchid. Some will realise that dream, but deliberately searching for new orchids might bring more disappointment than success. Aiming to become thoroughly familiar with, and understanding presently known species is immensely worthwhile and ensures that if you do stumble upon an unknown species, you will recognise it as such. Let the orchid find you.

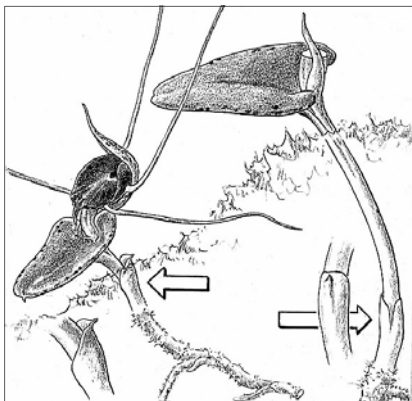
Since taxonomically, plants cannot be separated on differences in colour alone, in my view they cannot be regarded as different taxa. When *Chiloglottis valida* was found at Iwitahi, because the forest was about to be felled, plants found their way into the shade houses of several orchid growers. At Iwitahi the flowers were invariably dark purplish/brown, but in cultivation, as far as I know, all were green: proof of the wisdom of ignoring colour on its own, taxonomically.

When we notice apparent differences from familiar species, we must decide whether those differences are constant and important taxonomically, or are merely caused by unusual habitat etc.

In September 2002, disturbed by statements that the sheathing bract below the junction of petiole and peduncle on *Nematoceras* was an important diagnostic feature, I studied large colonies of *N. iridescens* in the Tangarakau Gorge. I found that the bract varied tremendously in position and in appearance. The portion of the present season's growth from which long root-like internodes emerge, later to carry terminal tubers, is clad in short hairlike feeding rootlets, just above which the bract is situated. Above the bract, leaf petiole and flower stem are fused until they are more or less clear of the leaf-mould and moss, at which point they separate, sometimes only about 3 mm above the sheathing

bract, occasionally as much as 55 mm. If the bract is well below the flower stem, it is normally more or less transparent, very fragile, and clasping the stem, in which case it is easily overlooked. When the leaf-mould is very shallow, the bract is sometimes exposed to the light, becoming more leaf-like and somewhat green. Between these extremes, bracts may remain sheathing with a faint keel ending in a spur just short of the apex. Certainly the position of the sheathing bract and its shape cannot be used as a diagnostic character for *N. iridescens*, nor I expect for any species in the genus.

Hooker's *Flora Novae-Zelandiae* 1853, contains an illustration by WH Fitch of *Nematoceras macrantha* showing considerable variation in the position of the bract [J86: p23].



Bracts on *N. iridescens* differing in shape and distance below the leaf

Just as an up-turned nose, or a large hooked one, does not disqualify us as members of the one human species, an up-turned or down-turned dorsal sepal on a species which normally carries that sepal more or less horizontally is of little

taxonomic importance. *NZNOG Journal* 77: p18 mentions a supposed taxon *Pterostylis* "brumobula", in which the apex of the dorsal sepal is down-turned, as is usual with *P. brumalis*, whereas other characters strongly indicate *P. alobula*. In fact the descriptions in *Flora II* say of *P. alobula* that the dorsal sepal is "us." ± horizontal and of *P. brumalis* that the dorsal sepal is "us." down-curved. Due attention must be given to the abbreviation "us." for usually. It implies that not all the flowers of *P. alobula* will carry the dorsal sepal horizontally. In this case, the difference in attitude of the dorsal sepal is of little consequence, whereas the key character of the flower lacking a "jug spout" at the junction of

the lateral sepals, clearly proclaims the plant to be *P. alobula*.

If further proof is needed that the plant is indeed *P. alobula*, consider the statement in *Journal* 77: "...rod-like dark labellum... spoke volumes for *P. brumalis*". The *Flora II* descriptions and illustrations show clearly that "rod-like labellum" fits *P. alobula* and not *P. brumalis*.

The *Pterostylis* "brumobula" confusion apparently resulted from thinking "outside the square", in this case perhaps, outside the wrong square.

I'm not suggesting that colonies of *P. alobula* with down-turned sepals are not worth recording – far from it – but why not report them in a straight-forward manner?

... CONTINUED FROM PAGE 27

cornuta, *Corunastylis nudum*, *Corybas cheesemani*, *Cyrtostylis reniformis*, *Diplodium alobulum*, *Drymoanthus adversus*, *Earina aestivalis*, *Earina autumnalis*, *Earina mucronata*, *Gastrodia cunninghamii*, *Gastrodia* aff. *sesamoides* ("livid green" fls), *Ichthyostomum pygmaeum*, *Linguella puberula*, *Microtis unifolia*, *Nematoceras acuminata*, *Nematoceras rivularis*, *Nematoceras triloba*, *Orthoceras novae-zelandiae*, *Petalochilus* – pink, cream and greenish, *Prasophyllum colensoi*, *Pterostylis banksii*, *Pterostylis graminea*, *Singularybas oblongus*, *Spiranthes novae-zelandiae*, *Thelymitra longifolia*, *Thelymitra* aff. *pauciflora*, *Winika cunninghamii*.

Rik from Belgium wrote, "Please take a look at www.riks.be (**European orchids**). It's just a start so there is still a lot to do. Best wishes". You can find the English version of the Lankester Foundation's (**Costa Rica orchids**) web page at www.fundacionlankester.org. David McConachie wrote, "Here is an **interesting discussion about DNA analysis** and its role in the taxonomy of an orchid alliance: <http://www.loujost.com/DNAFrameset/DNAanalysisDocument.htm>. After reading

this article I have started to re-read *AOR* 4 to compare the *Pterostylis* data." David later asked, "Have you seen this ***Rhizanthella*** page? http://members.iinet.net.au/%7Eemntee/Rhizanthella_gardnerii1.htm"

Pat Enright wrote, "***Drymoanthus adversus*** seems to be palatable to cattle as witnessed by some plants at Wilderness bush near Matarua Stream above Alsops Bay, Lake Wairarapa. This species along with the other epiphytic orchids does not seem to be common in the Eastern Wairarapa Eco district but we did find four in an area of bush near Flat Bush Station (+ *Winika* and both *earinas*)."

The New Zealand Plant Conservation Network was registered as an incorporated society in midapril 2003, with NZNOG among those represented at the first incorporation meeting in Wellington. A national meeting of the society is to be held in Wellington at Te Papa on Saturday 2 August. This will be an important meeting, and if you can attend, please do. NZNOG's membership of this formally incorporated society will provide capabilities that are currently beyond us as an informal group.

who receives the journal?

Life members ED Hatch, 25 Tane Rd, Laingholm. JB Irwin, 192 Bellevue Rd, Otumoetai. Brian Molloy, 20 Darvel St, Riccarton. Trevor Nicholls, 33 Hinekura Ave. Dorothy Cooper, 4-24 Russell St, Levin.

Ashburton Angela Abernethy, 50 Short St. David Shaw, Baireburn Nurseries, PO Box 491.

Auckland Mrs Marjorie Newhook, 24 Landscape Rd, Mt Eden. Alva W. Gosling, 14 Reisling Place, Western Heights, Henderson. Harold Waite, PO Box 24-108, Royal Oak. Ron Whitten, 5 Thorley St, Mt Eden. Noel Townsley, 6 Woolley Ave, New Lynn. Sandra Jones, 14 Park Rd, Titirangi. Cath Mayo, 79 John St, Ponsonby. Chris Hubbert, PO Box 3451. Dr Ross E. Beever, Landcare Research, PB 92170. Graham Marshall, 106 St George's Rd, Avondale. Mr E Cameron, Botany Dept Auckland Museum, Private Bag 92018. Mr RB St Paul, 101 Gt Barrier Rd, Waiheke Island. Allan Ducker, 1669 State Highway 17, RD 2 Silverdale. Paul Left, 1Rhodes Ave, Mt Albert. Peter de Lange, Department of Conservation, POBox 68908 Newton. Sue and John La Roche, 35 Geraldine Place, Kohimarama.

Awanui Mrs BV Hoggard, RD 1.

Banks Peninsula Hugh Wilson, Long Bay Rd, RD 3 Akaroa.

Buller Leicester Kyle, c/- Postal Agency, Ngakawau.

Cambridge Mrs Betty Seddon, 11 Grey St. Tim Oliver, RD 2.

Christchurch Maurice Sinclair, Hoon Hay Valley. Rodney Boon, 57 Townshend Cres. Jennifer Manning, 258a Mt Pleasant Rd. Joy Talbot, NZ BotSoc Newsletter Editor, 17 Ford Rd. Matthew Walker, 28a Tabart Street. Dean Pendrigh, 6 rue de la Mare.

Dunedin Moyna Müller, 11 Fyfe St, Wakari.

Eltham Claire Pullman, 4 Mill St. Margaret Menzies, No 19 R.D.

Foxton Mrs LP Chrystall, 489 Highway One, RD 11. Susan Hansard, Box 176.

Gisborne Mrs Nancy Adye, 30 Adair St.

Greymouth Paul Lambert, 45 Lydia St.

Hamilton Bev. Woolley, 8 Beverley Cres. Bruce & Bev. Clarkson, 7 Lynwood Pl. Curator Waikato Herbarium Catherine Beard, Dept Biol. Sci University of Waikato, Private Bag 3105. Jean Coe, 20 Birdwood Rd, Horotiu RD 8. Marilyn Merrett, Private Bag 3127. Mr M Gibbs, 27 Balfour Cres. W.H. Fransen, 6 Wedgewood Place. Mrs Diane Willson, 11B Arcus St.

Hawera Glyn Wren, 2 Hauroto Rd, 14 RD.

Hawke's Bay Geoff Foreman, 6 Rimu Drive, Wairoa. Sally Hansen, RD 2, Limehills - Poukawa.

Hockley Mrs Sandra Moore, 35 Trelawn Place, Cockle Bay.

Invercargill Kelly Rennell, 42 Arundel Cres. Mrs I Lankshear, 292 Racecourse Rd.

Johnsonville Fraser Broom, 11 Nether Green Cres.

Kaiaua Mr G. Stacey, PDC Private Bag 2.

Katikati Shirley Kerr, 10 Clive Rd.

Levin Brian Tyler, 4 Byrd St. Ian Townsend, 30B The Avenue. Ian Cooksley, Manakau North Rd, RD 31 Manakau.

Lincoln Landcare Research NZ Librarian, PO Box 69.

Mahanga Margaret & David Fraser, 4 Judges Parade, RD 8 Nuhaka.

Masterton Mrs Lyn Coley, c/- Mokau, RD 2. Mrs Phyllis Jackson, Rural Fire No 72 Mauriceville, RD 2. **Matata** John Groom, PO Box 1.

Napier David & Beverley Lowe, 12 Alexander Ave, Onekawa. PC Shapcott, 35 Titoki Cres. WF Liddy, 8 Thurley Place, Bayview.

Nelson Cathy Jones, Flat 2, 5 North Rd. Dr G Bennett Wilkinson, 8 Coutts Place, Mapua. Gordon Sylvester, 345 Sherry River Road, RD 2 Wakefield. Mark Moorhouse, 10 Tainui St, Stoke. Mr Shannel Courtney, Dept of Conservation, Private Bag 5. Mrs JM Jenks, RD 2, Upper Moutere.

New Plymouth Barbara Hammonds, PO Box 415. Barry Hartley, 12a Ronald St. Ernie Corbett, 10 Protea Place, Bell Block. John Dodunski, 22 Hartland Place. Miss Ina McLellan, 6 Aubrey St. Mr G Fuller, 6 Torbay St. Mr Ken Davey, 211 Ngamotu Road. Roger Watkins, 413 Devon Street East, Strandon.

North Canterbury Mrs B Pickering, Coopers Creek, Oxford. Thom Pendrigh, 230 High St, Oxford.

North Shore Pauline Lawes, 31 Glenvar Rd, Torbay ECB.

Oamaru Julie and Gary Speer, 11 Ure St. Mrs Barbara McGann, 4a Rother St.

Otautau Sid Smithies, 216 Main Rd.

Palmerston North (Serials) Librarian, Massey University, Private Bag 11054. Barbara Elliott, 36 Ronberg St. David McConachie, 15 Battersea Place. Don Isles, 33 Swansea St. Yvette Cottam and Bruce Sinclair, 329 Kahuterawa Road, RD4.

Papakura Eric Scanlen, 4 Sunny Park Ave. **Pukekohe** John Neilson, 52 Prospect Tce.

Rotorua Chris Ecroyd, 33 Raniera Place. Wildland Consultants Ltd, 5B Owkata Rd, PO Box 7137 Te Ngae.

Taranaki Mr GE Penniall, 55 Hickman Rd, Urenui RD 45. **Taumarunui** E. Anne Fraser, RD 4.

Taupo Mr DS Mitchell, 13 Robinson Tce. Mrs DE Abraham, 14 Nisbet Tce, Kinloch RD 1. Sue and Robbie Graham, 141 SH1, Waitahanui.

Tauranga Gael Donaghy, 52 Anne Rd. Beryl and Bob Goodger, 9 Somerset Grove. Caleb Lamond, 99 Tebbutt Access, RD 1. Mrs Wilma Fitzgibbons, 105 Dickson Rd, Papamoa.

Te Kuiti Mrs CL Aston, Hillview Home, 8 Hospital rd. Timaru Mrs Diane J Barron, Hadlow Rd, RD 4.

Turangi Dept of Conservation (Nick Singers attn), Tongariro Taupo Conservancy, Private Bag.

Waihi Mrs JP Green, 37 Consols St.

Waiuku Patricia Aspin, Hatton Rd, RD 4. Stella Christoffersen, 34 Cooper Rd, RD4.

Wanganui Michael Pratt, Waikupa Rd, RD 12. Mr and Mrs Robert L. Macnab, PO Box 36. Mr Colin Ogle, 22 Forres St. Ross Macdonald, 116 Fitzherbert Ave.

Wellington Mr Philip Tomlinson, 14 Putnam St, Northland. Gordon Purdie, 19 Thatcher Cres, Crofton Downs. Anne Southern, 31 Haunui Rd, Pukerua Bay. Annette Fairweather, 50 Ponsonby Rd, Karori. Cesar Zapata, PO Box 11-969. Dept of Conservation: Serials, Central Library, PO Box 10420. Legal Deposit Office, PO Box 12-340. Pat Enright, 19 Gaya Grove, Ngaio. RW Hornabrook, 27 Orchard St, Wadestown. Suzan Dopson, Biodiversity Recovery Unit, Dept of Conservation: PO Box 10-420. The Hector Librarian, Museum of NZ Te Papa Tongarewa, PO Box 467. The Librarian, Royal Society of NZ, PO Box 598. Timothy Park, QEII National Trust, PO Box 3341. Ian St George, 22 Orchard St, Wadestown.

Whangarei Albert Blumhardt, 15 Tainui St, Onerahi. Anne Puttnam, PO Box 194. Dept of Conservation, Te Papa Atawhai, PO Box 842. Mrs Penny Berks, 31 Third Ave. NJ & J Hewinson, Rushbrook Rd, RD 1 Kamo: Matarau.

Australia E. Boudette, 11 Cypress St, Lawnton QLD.4501. Sec. West Aust.Nat.Orchid S&C Grp, PO Box 323, Victoria Pk Western Australia 6100. Editor Victorian Group ANOS, 56 Civic Parade, Seaholme VIC 3018. Graeme Bradburn, 10 Jaylang Place, Figtree 2525 - NSW. Leo Cady, 5 Weir St, Kiama 2533 NSW. Librarian Australian Nat.Bot.Gdns, GPO Box 1777, Canberra - ACT 2601. Sec. ANOS Illawarra, 13 Eleanor Ave, Oak Flats - NSW 2529. Sec. Australasian Native Orchid Soc, PO Box 318 Willoughby, NSW 2068. Warren Simpson, RMB 8510 - Hill End, VIC 3825. Ruth Rudkin, 18 Lyle Ave, Lindfield NSW 2070. Peter Eyselshoven, 13 Weeroona Ave, Elanora Heights NSW 2101. Bob Bates, c/- Post Office - Mylor, SA. Secretary Native Orchid Society of SA, 33 Margaret St, Henley Beach, SA.

England Librarian Royal Botanic Gdns, Kew: Richmond, Surrey TW9 3AB. Neville & Kathy Henderson, 32 Chalkland Rise Woodingdean, Brighton BN2 6RH Sussex.

Switzerland Rudolph Jenny, Mooseweg 9, 3112 Allmendingen.

in this issue...

Cover

Gastrodia cunninghamii from Stewart Island—
watercolour by Dorothy Jenkin, 1965.

Editorial—Ian St George

2. The science of scents—1: orchid odours.

The column—Eric Scanlen

5. 2003 National Park SPLOSH (Swamp *Pterostylis* Location
& Other Species Hunt).

9. *Earina mucronata*—*E. aestivalis* sequel.

10. *Corybas* alliance round up

Close relations: orchids like ours

13. “Greenhoods” watercolour by WH Nicholls, 1933, from *Gems of the bush*.

Historical reprint

14. William Colenso describes *Gastrodia leucopetala*.

Canadian notes—Marilyn Light

16. Seasons in the life of some Canadian orchids: Part 3:
Canadian nectariferous orchids - *Platanthera*.

Australian notes—David McConachie

19. East meets west. Mike Duncan.

From the field

20. Gary Penniall returns to Te Pahi.

Notes, letters, news, views, comments

24. Dorothy Jenkin, orchid artist.

27. Kelly Rennell on southern *Gastrodia*. *Danhatchia* near Matamata.
Orchids of the northern Horowhenua.

29. Websites for Belgium, Costa Rica, DNA, *Rhizanthella*.
Do cows eat *Drymoanthus*? An important conference in Wellington.

Viewpoint

28. Let us keep our feet on the ground: Bruce Irwin.

30. Journal recipients 2003



The New Zealand Native Orchid Group owns copyright of this material: our main aim is informing people about native orchids. We therefore do not guard material in our *Journals* as exclusive intellectual property, but permit other botanical publications to copy it, provided the source and author are acknowledged. Authors should note this as a condition of acceptance of their work. The *Journal* is published quarterly from March, and deadline for copy is the first of the month preceding. We prefer copy to be typed or sent on disk or by email.

Subscription NZ\$30.

Editor: Ian St George, 22 Orchard St, Wadestown, Wellington, phone 04 4994227, fax 3894178, istge@rnzcgp.org.nz.

Conservation officer: Peter de Lange, DoC, PO Box 68908 Newton, Auckland, phone 09 307 9279, email pjdelange@xtra.co.nz.

ANOS liaison: David McConachie, 15 Battersea Place, Palmerston North, phone 06 3586559, email pleione@ihug.co.nz.

Field trips: Eric Scanlen, 4 Sunny Park Ave, Papakura, Ph. 09 2984868, email eascanlen@xtra.co.nz.

Editorial Board: Mark Clements, David Jones, Peter de Lange, Brian Molloy, Eric Scanlen.