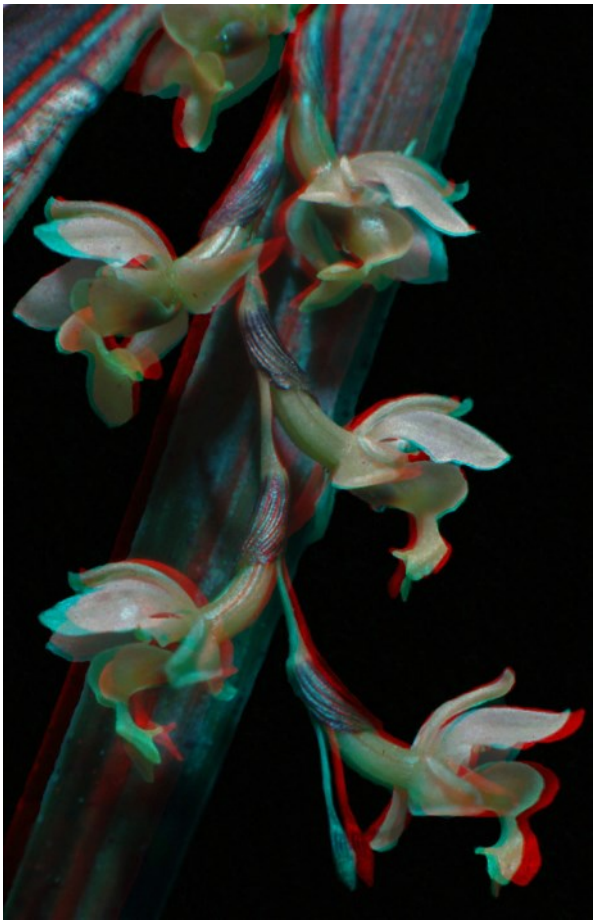
The New Zealand Native Orchid Journal

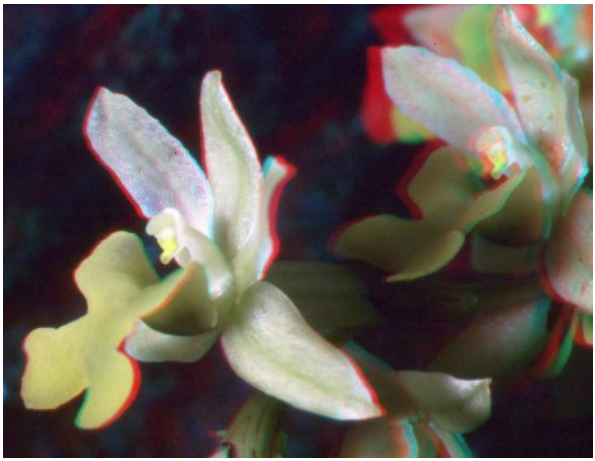
No 138
November
2015

Orchids in 3D—

In this issue we start a series of anaglyph 3D shots of New Zealand orchids supplied by Eric Scanlen. There are several ways of delivering 3D photographs, but red/cyan "anaglyph" is the most practical and universally acceptable. It does require the use of red and cyan glasses, so your free pair is included with this issue: look after them for future issues—after this if you want to replace them you will have to pay! Wear them over your reading glasses.



◄ September-October flowering *Earina mucronata* from bush downstream of Mangatangi Water-Supply Dam in the Hunua 19 Sept 1986. Tepals crowd and obscure the dumpy column.



◄ December-January flowering *Earina aestivalis* from Matakawau's one time sand-hills, has been confused with *E. mucronata* but note the long, straight, ovary and the wider spread tepals showing off the column which lengthens in maturity. *E. aestivalis* thrives in drier coastal regions but *E. mucronata* prefers wetter climes such as montane habitat.

The type locality

Ian St George

Corybas cheesemanii from Purewa

In naming *Corysanthes cheesemani* in 1876 JD Hooker recognised Thomas Frederic Cheeseman (even though he did get his initials wrong—see next 2 pages) who first collected it "in a dense bush" at Purewa, then five miles from Auckland. In dissecting the flower they must have left a strip of labellum attached, for WH Fitch drew a ribbonlike process that isn't a normal structure.

The following year Hooker corrected that error,

When describing Corysanthes Cheesemani (Tab 1120) I left in doubt certain points of structure, in respect of which I differed from the discoverer of the plant and from the artist whose figure is quoted above. These I am now enabled to clear up by means of specimens in spirits, kindly communicated by Mr. Cheeseman.

In none of these do I find the ligulate process figured, nor anything in its place. The base of the lip is produced downwards on each side of the mesial line into a conical hollow obtuse short spur, between which spurs the two lateral sepals, reduced to subulate ascending processes, are projected as represented in figs. 1 and 2. I find no trace of petals.

The lamina of the lip varies much in shape; it appears usually as represented at fig. 1, but sometimes as in fig. 2, and in few cases it is reduced at the apex, having no reflected portion.

As a species, C. Cheesemani is very clearly allied to the Australian C. fimbriata, Br., differing chiefly in the spurs of the lip and absence of petals.

It is hard to imagine a dense bush at Purewa now, but Bishop Selwyn had painted the vicinity in 1845 and that scrub certainly looks like suitable habitat (Mt Wellington in the background).

Selwyn, George Augustus, 1809-1878: Purewa [and the first St John's College] ca 1845; Ref: A-439-007. Alexander Turnbull Library, Wellington. http://natlib.govt.nz/records/22915215

PLATE 1120.

CORYSANTHES CHEESEMANI, *Hook. f.*

ORCHIDEÆ.

C. Cheesemani, *Hook. f.*; folio sessili cordato-orbiculari apiculato, flore subsessili, pedunculo post anthesin elongato, ovario bractea spathacea vaginato, sepalo dorsali galeato obtuso, lateralibus setaceis minutis labello suppositis v. obsoletis, petalis lateralibus setaceis v. 0, labello tubuloso columnam amplectente, ore ampliato recurvo 2-lobo, lobis reflexis subintegris, marginibus basi utrinque in auriculam deflexam obtusam productis.

HAB. New Zealand, amongst bushes at Purewa, near Auckland, *F. F. Cheeseman, Esq.*

This curious little species was first brought to my notice in 1867 by F. F. Cheeseman, Esq., of Auckland, a very acute botanist, to whom I am indebted for several other interesting discoveries in the Northern Island, and notably the beautiful little *Hymenophyllum Cheesemani* (Baker, mss.), of which a figure is prepared for this work.

Corysanthes was found at Purewa, about five miles from Auckland, flowering in June and July, in a dense bush, principally composed of *Myrsine Urvillei*, *Senecio Forsteri*, and *Leptospermum scoparium*, with a thick undergrowth of various species of sedges.

Mr. Cheeseman describes the leaves as more membranous than those of any other species known to him, and the flower as dull purple with several greenish stripes and blotches on the surface of the upper sepal; he adds that the margins of the lip meet behind the column and enclose it, that the lateral sepals, when present, are very narrow-linear, placed under the lip and never exceed it, and that the petals, when present, are very minute indeed, subulate, deflexed, and placed under the basal tubes of the lip.

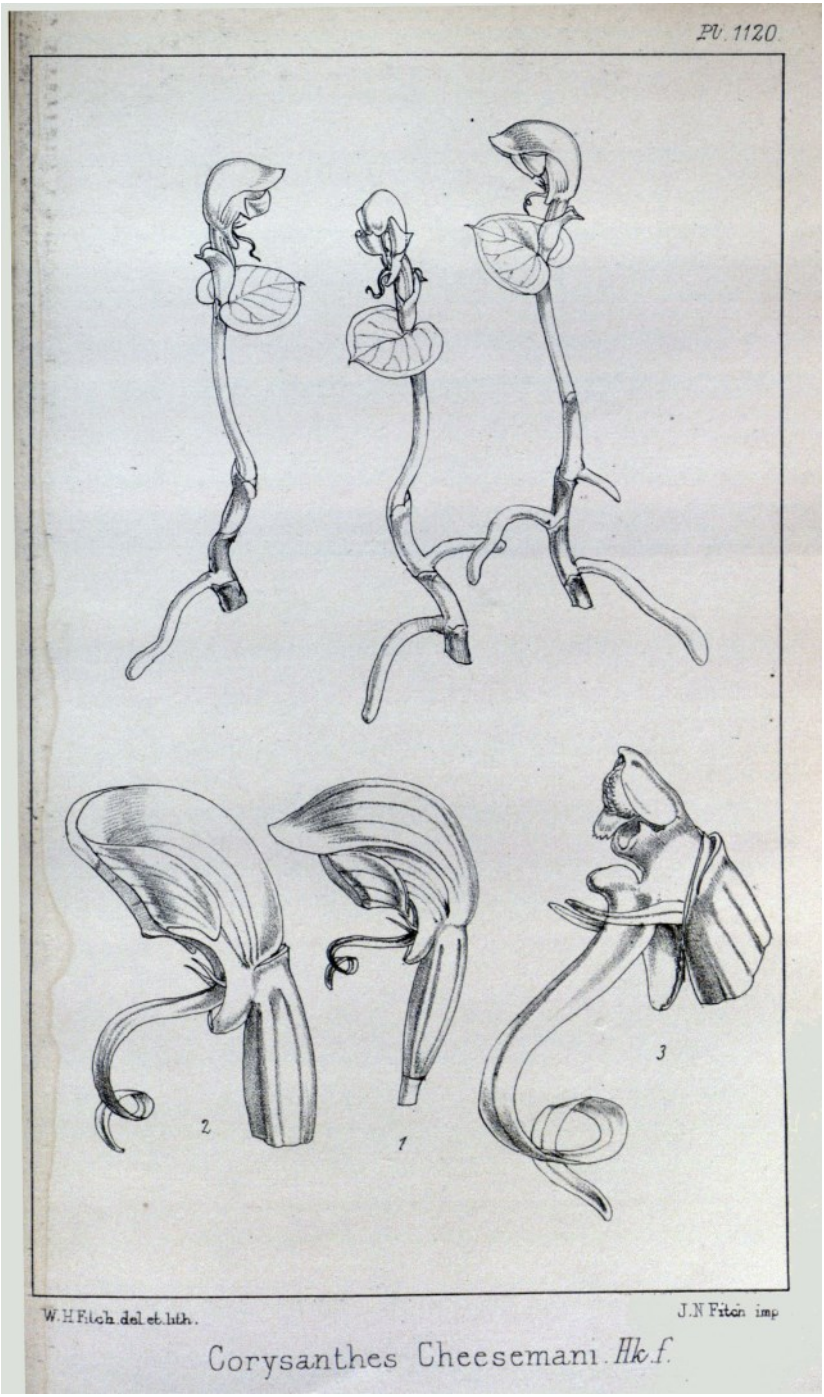
JD Hooker's original description, from *Icones plantarum* 1876.

This description does not fully accord with my examination of several specimens, nor do either of them accord with Mr. Fitch's drawing, owing to the extreme difficulty of macerating the flower for the purpose of dissection. Mr. Cheeseman does not describe the curious ligulate, often twisted, process which proceeds in some specimens from the very base of the lip, at its medial line, and which I find to be sometimes replaced by two subulate processes; this is incorrectly represented in the accompanying Plate as a continuation of the base of the column. This must either be a process of the base of the lip, or consist of the two lateral sepals,—a view favoured by the fact of its being sometimes replaced by two subulate bodies. The subulate lateral petals I never found in all the specimens which I have examined.

The similarity of this species to Brown's Port Jackson *C. bicalcarata*, is so strong that I suspect that it may prove identical with it; I hesitate however to unite them without further materials, the dorsal sepal being much less arched in the New Zealand plant.

I regret to observe that it is proposed to replace Brown's generic name of *Corysanthes* by Salisbury's somewhat earlier one of *Corybas*, the totally erroneous description of which was (as was well known at the time) drawn up surreptitiously from an inspection of Bauer's figure of the Australian *Corysanthes bicalcarata*, when exhibited by Robert Brown at Sir Joseph Banks's rooms, with the latter name attached to it.—J. D. HOOKER.

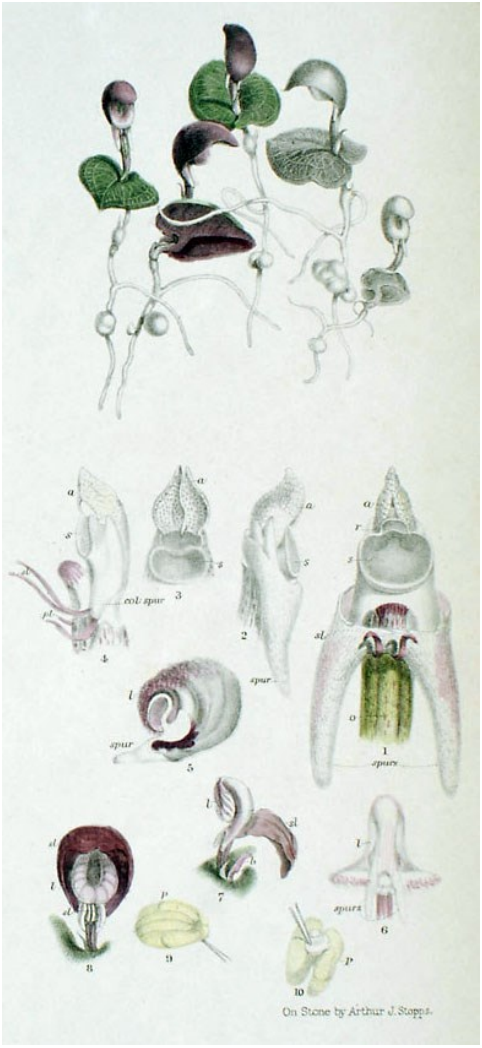
Fig. 1. Flower. 2. The same with the dorsal sepal removed. 3. Column, petals, and lip:—*all magnified.*


Pl. 1120.
W. H Fitch. del et lith.
J.N Fitch imp
Corysanthes Cheesemani. Hk.f.
2
1
3

Hooker used the generic name *Corysanthes* in deference to the discoverer of the genus Robert Brown. Brown had prepared a description of what he would publish as *Corysanthes bicalcarata* in 1810, but the description and drawings were surreptitiously copied by Richard Salisbury who published them (with purple rather than magenta flowers owing to a misinterpretation of the colour notes by the artist W. Hooker—no relation of JDH) in 1807 as *Corybas aconitiflorus*. It caused a scandal at the time, and many botanists persisted in using Brown's name until the nomenclatural rules of precedence became firmly entrenched and Salisbury's name *Corybas* was regarded as correct.

Thomas Kirk had described *Corysanthes cheesemanii* in *Trans N.Z. I.* in 1870—he obtained specimens from Te Whau, Orakei and Titirangi. Kuntze formally transferred it to *Corybas* in 1891. Cheeseman thought in 1906 that it might be identical to *Corybas aconitiflorus* and as late as 1930 Rupp lumped it back into *Corysanthes bicalcarata;* Hatch agreed but

Corybas aconitiflorus,
by W. Hooker, from Salisbury R 1807.
Paradisus Londinensis 98, t83.



Corysanthes bicalcarata,
detail from RD FitzGerald's
Australian orchids, 1876–1879.

reverted to the name *Corybas aconitiflorus* and so did Moore.

Molloy, Clements and Jones recognised differences and *Corybas cheesemanii* now stands.

Corybas cheesemanii: from Wellington▼

A hypochromic *Corybas cheesemanii* photographed by Matthew Ward at Paraparaumu in August 2012.

Original papers

A. Management of orchid information

By Mike Lusk, Havelock North.

Most or all of us are storing our pix electronically and I assume that all of us would wish that they be easily accessible and searchable in ways that might make them useful to others, particularly after we've moved on. It has occurred to me that it will be even easier for surviving relatives to delete electronic files than it is to throw chocolate boxes of family photos into a fireplace or skip. I like to think that neither is as likely to happen if the next of kin is confronted with a degree of organisation. It would probably be worth annotating your will too.

My system is still evolving and because I didn't start early enough I'm in the midst of a rather exhausting process.

The major folder is simply "Native Orchids' stored alphabetically. This is now pretty large, thanks to *Corybas trilobus* and *Pterostylis montana*, but at least I know I can easily find a reasonable pic of any orchid I've seen. Each pic is labelled with the binomial name, place seen and full date. I've found it helps to create a sub folder for any taxon for which I have more than about 20 pix. These include the above two and others such as genus *Prasophyllum*. There's also one labelled "Orchids for Sorting" which is, at present, large.

My software does allow me to search by name of site but for a few places that I visit frequently I keep a separate folder. This does mean some duplication but it would make it easy to provide pix of all orchids seen to the controller of the particular area—generally DOC. One day I hope they'll ask! Such a folder also makes it easy to compile a cumulative list for each site. Dropbox is an option for sharing pix but free storage is quite limited and extra is expensive.

In the field I keep a small ring-bound diary mainly concerning orchids. I write in pencil and now transfer the information promptly to an appropriate computer file. Favourite haunts have a file and other files cover groups of less frequently visited areas. This way I can check before I visit a site so that I can know what to expect. For a few sites I'm planning to add species that should be there but which I have been unable to find. I'm also able to provide information to visiting orchid people whom I'm unable to accompany.

No doubt there are other systems, quite possibly better. If you think you have one please let us know about it.

The NZ Native Orchid Journal

The main aim of the **New Zealand Native Orchid Group** is informing people about native orchids, so we permit others to copy material published here, provided the source and author are acknowledged. Authors should note this as a condition of acceptance of their work. The *Journal* is normally published quarterly from February, and deadline for copy is the first of the month beforehand. We like copy to be typed or sent on disk or by email.

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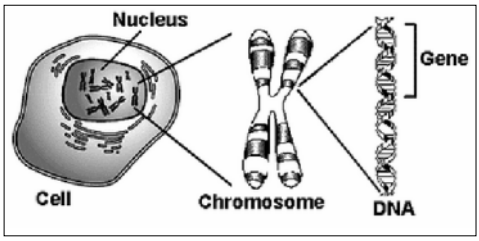
WE MAY NOT SHARE AUTHORS' OPINIONS

B. DNA for the amateur botanist

By Mike Lusk, Havelock North.

Please note that this is a very simplified summary, designed mainly to be understandable to people who want to gain a basic knowledge of how DNA is useful in the classification of organisms (Taxonomy). I've tried to avoid using jargon but there a few words which need explanation:

Molecule: A chemical comprising two or more atoms. (H and 0 represent atoms of hydrogen and oxygen, but together they form H_2O, a molecule of water.)



Gene: A relatively small section of DNA, found at a specific place on a particular DNA molecule. Each gene is a code for the production of a particular molecule.

Genotype: The full set of genes carried by an individual.

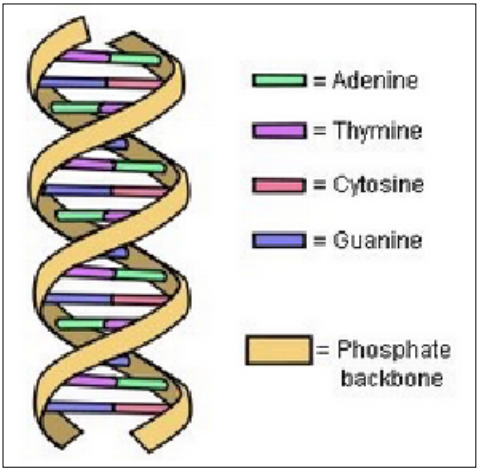
Phenotype: The recognisable features of an individual. Thus the phenotype is the outward expression of the genotype.

Enzyme: A molecule which will speed up a chemical reaction.

Base Pairs: Four small molecules which combine in pairs to form the rungs of the ladder. Each base is attached to the DNA backbone and the rungs of the ladder are formed by the pairing of one base with its counterpart, attached to the other backbone. Further, each base will pair with only one of the others (A will only pair with T and G with C)

Primer: A molecule that is used as a starting point for DNA fragment copying.

Deoxyribonucleic acid (DNA) was discovered as 'nuclein' from pus, in 1869 by Mieschner. Others realised it might be the substance that carried the messages for the manufacture of proteins. In 1954 Watson and Crick solved the mystery of the structure of the DNA molecule and the popular book Watson wrote recounting the events is excellent reading. DNA is built like a ladder, with 2 uprights and many rungs. It is twisted along the axis of the uprights forming a double helix (Fig 2)and further buckled so that it fits more readily into the large aggregations of DNA called chromosomes. Because the DNA ladder is unzipped along its length in the course of sexual reproduction the number of chromosomes in each cell (except the sex cells) of a particular organism is recorded as 2n=X where n is half the number of chromosomes and x is the total number. Humans for example, are 2n=46 so that in all but sex cells there are 46 chromosomes and in each sperm and egg there are 23, so that when a sperm and an egg unite the form the first cell of the embryo, the 2n number is restored.



Later research showed that the code held in the DNA is, after the DNA strands have been unzipped, read by ribonucleic acid (RNA) which carries the message to the area of the cell where protein molecules are made. These proteins in turn are responsible for the great complex of chemical reactions that makes an organism alive.

In recent years the entire code (the genome) of an organism can be read so that the exact sequence of the individual chemicals that make up the DNA can be written down. With automation the speed and cost of achieving this have dramatically improved. It is known that well over 90% of the DNA in a cell is non-functional ('junk DNA') and that the sequences which are functional (each called a gene) are in predictable places on each DNA molecule, and hence predictably on each chromosome. For example, genes involved in the resistance of tomatoes to late blight (target spot) are located towards the end of the chromosome number 10. Many characteristics are coded by more than one gene and genes can be switched on and off.

It is now possible to read small parts of the code of one organism so that it can be compared with another. This is done by breaking up the strand of purified and unzipped DNA into predictable fragments using heat. Chemicals called primers which will attach only to particular fragments can then be added and the chosen fragments separated from the mixture. By the use of an enzyme called polymerase, a particular chosen fragment can be multiplied, again by the use of carefully controlled changes in temperature, to provide an enormous number of identical fragments in a matter of hours, for analysis. (The process of the multiplication of the fragment is called the polymerase chain reaction, PCR.)

Fluorescent dyes which attach specifically to a particular base are then added to the fragments and a machine is used measure the light emitted by the base/dye combinations. Interpretation of the resulting 'spectrogram' gives the sequence of bases on the fragment and this can then be compared with the known sequences of chosen relatives.

You may well wonder how the DNA fragments to be analysed in a study plant are chosen. The decision can often be informed because the amount of detailed information on the site and molecular structure of individual genes of individual species has increased very rapidly and continues to do so. This means that a choice can be made of the most appropriate fragments of the study plant to be analysed so that comparison with the already known details of the same site in relatives can be made. (It should be said that for some plants, including some orchids, that there is not yet enough baseline information to make comparisons easy or even possible.)

Currently it is not practicable to compare full genomes and it may be that the chosen sites will not show any differences. There is a problem in some NZ plants because, with the geological youth of the country there has been a relatively short time for evolution to occur. Thus plants which are obviously different may show no DNA difference, even if a large number of sites are studied. In fact there is still disagreement as to how many DNA differences are required to define a distinct species So we'll still have arguments about what is, and what is not a species, and name changes won't go away soon, or possibly ever! DNA analysis is just another tool in the taxonomic box but as methods are refined and costs further reduced, more molecular information will become available. This will still need to be considered along with more traditional features such as difference in outward appearance, habitat choice, flowering time etc

Carlos Lehnebach has helped me very considerably with corrections and suggestions but of course carries no responsibility for any inaccuracies.

The sites below may be of interest

https://www.dnalc.org/view/15479-Sanger-method-of-DNA-sequencing-3D-animation-with-narration.html

http://media.invitrogen.com.edgesuite.net/ab/applications-technologies/pharma-biotherapeutics/DNA_sequencing.swf

A. Mt Cargill *Chiloglottis* revisited

—by Kathy Warburton, Dunedin

This summer I have been out and about looking for *Chiloglottis cornuta* plants on the local tracks and trails, and I realized that the particular colony I found on Pigeon Hill under *Pinus radiata* forest seems to match Bruce Irwin's drawing in the book/DVD.

It is at a damp spot at S 45^0 48 .441' E 170 ^{0} 32.659' at elevation 584m. Plants are growing in the pine mulch as well as on a rotting log. I photographed several plants over a number of visits in January and February 2013, and made one final visit to photograph and measure the fruiting scapes on 5 April.

Observations I recorded: were that the floral bract does not sheathe the ovary, but sits back at an angle as shown in **Fig. 2**. The bracts are approximately 50mm long, and located at the base of the scape which rises to a height of between 200 and 230mm on measured specimens (measured from the base of the scape to the base of the capsule). The dark red calli are sessile, and variable in size and shape. Leaf size and shape are also variable; it was not unusual for one leaf to be noticeably longer than the other (one specimen the difference in size was 30mm, being 60 and 90 mm long).

Also, while on Mt Cargill slopes I found a small colony of green- flowered *C. cornuta* with green calli, however, they were in a much debilitated state from having been severely trampled. These were located at S 45^0 48.656' E 170^0 32.870' at elevation 599m. The colony was sited near the edge of a group of pine trees, so that they received more light than the colony earlier described in this article. The situation was very wet, with cutty grass growing around.

I hope to revisit the area again next spring and summer, it is very accessible, being only an easy 20min stroll from the road to the Pigeon Hill colony and 5 mins for the other location.

Fig. 1 Pigeon Hill *Chiloglottis cornuta*, note the uneven leaf sizes.

Fig. 2 Rear view of flowering plant showing the shape and position of the floral bract.

▲**Fig. 3** Labellum showing the calli and also the appendage at the base of the labellum.

▲**Fig. 4** Plant with mature fruit on long scape, bract at base.

2015 Update: In spring 2014, the area where the red calli Chiloglottis was growing was logged and bulldozed into winrows. I doubt that the plants have survived, however, I do plan to revisit during January/February 2016 in the hope of locating a population.

B. *Chiloglottis* in Nicols Creek Dunedin

—by Kathy Warburton

Nicols Creek is a small side valley off the upper Leith stream. The stream bed consists of gorges with several waterfalls between, while the slopes in the upper valley form a basin covered largely in regenerating bush and Sphagnum bog. There are several old trails in the area, relics of when much of the bush was felled in the late 1800s, and I have had the pleasure of exploring these, and discovering the orchids on them.

A micro-climate exists in the little valley which runs northwest for less than 2km, and is sheltered from both the cold southerly and northeasterly winds. It is certainly attractive to our native ground orchids. After the first flush of spring, I am attracted to the area again and again to seek out and photograph the little bird orchid. Flowering usually takes place in November / December in this area, but this past summer, the flowers have not been evident until late January to February.

Several colonies of *Chiloglottis cornuta* have been located along the course of the Pepper-tree track , entry off the Pineapple walkway at S 45º 49.781' E 170º 29.138'.The track which is an unmarked route only, more or less sidles around the head of the upper basin of Nicols Creek at about 500 m.

The *Chiloglottis* are growing under a light

canopy of regenerating bush, most notably under dead manuka. What I have found interesting about these, is the colour variations of the flowers. A colony seems to be either green flowering with green calli or of pale coloured flowers with calli of variable hue, although none with dark red, or strongly coloured calli seem to be present in this area. While the colour differences are immediately obvious, there are other differences, too. The basal calli on some of the plants are strikingly prominent, while on other plants the calli are less so. Leaf shape, size and colour are also variable.

No doubt these variations occur in other areas too, if we had the time to visit and revisit and visit again we would find them. The pale coloured *C. cornuta* are mainly growing under lightly dappled shade in dampish soils. The green flowered, green calli example is growing under heavier shade on a well-drained bank although I have also found similar flowering plants under lighter shade. I also noted the high concentration of cotyledons present at the largest colony of green calli plants. (Location S 45º 49.385' E 170º 29.128').

The floral bract on the coloured calli plants clothes the ovary and remains at the base when the scape extends. I measured a mature scape on 6 April at 230mm in height; during the summer, I measured others at another location on the track at only 150 to 180mm, also with the bract at the base of the scape. I have yet to note and photograph the mature fruiting scape of the green calli plants, if any.

Fig.1 The smallest, most delicate *C. cornuta* I found on the track. 12mm across the flower, and less than 10mm high.

Fig.2 The green flowering colony with the cotyledons.

Fig.3 The green flowers with green calli.

Fig.4 The pale coloured flower with the strikingly prominent calli array.

Fig.5 The bract at base of mature scape in April.

A. *Pterostylis banksii*

—by Melanie Brigden

Despite suggestions that *Pterostylis banksii* is not to be found in the South Island, I believe I have found it, in its namesake location, Banks Peninsula.

It is possible this wee colony has been hiding for decades.

Gordon Sylvester presented an interesting talk some years back to the Canterbury Orchid Society on his library research into the records of early botanists and enthusiasts before the bushcover of the Peninsula was widely felled.

The Peninsula is very arid these days but pockets of bush reserve remain, carefully tended by the Summit Road Society and landowners.

John Johns and Brian Molloy in *Native Orchids of New Zealand* 1983 have an image on p.92 of this type of reserve, close to the site of this story.

In November 2014 I was on the Peninsula checking the many specimens of *P. areolata* that are known along some of the trails.

Blow me down, I had a "McConnachie at Arthurs Pass" moment when these flowers stopped me in my tracks.

I went back over 3 weekends in November–December. Paul Tebbutt, volunteer warden of the Summit Road society came along to check out the location and Gordon Sylvester visited from Greymouth to check out the identity.

The colony is half a dozen plants over a couple of metres.

The plants fit the latest description in *A pocket guide to the New Zealand native orchids* p 83 excepting that the leaves do not extend above the flower.

So, do you think I have found *Pterostylis banksii* on Banks Peninsula? Come visit around our Show Weekend, midNovember and let's go for a nosy. It is a 70 minute walk from the road.

In the same reserve are occasional *P. graminea,* and many *P. areolata,* which I have been monitoring for some years. Specimens range in colour from straight greens to quite richly bronze red overlaying green. Rarely the same colours the next year in the same patch which reminds me of Allan Ducker's observations of change in *Thelymitra* in Waikumete cemetery.

It is good to see this species often in the same density as that shown in page 92 of Johns and Molloy, that image having been taken in 1983 at the latest.

B. Seaward Bush

—by Melanie Brigden

They grow 'em big down south.

What on earth is this?

Each flower's natural width across the lateral sepal-tips was 120mm.

It is similar to *Pterostylis banksii* except that this flower is more plump and each plant has dorsal sepals pointing downwards.

Here's another view:

Yes, that's 12cm across.

I am reasonably familiar with the variations in *P. australis*, and by location that's a possibility but the dorsal sepal is too long. So what is it?

On the same track we found two distinct forms of sinus – wide as a Fiordland glacial basin and as deep a V as a river gorge:

The first ▲ is *P. australis* and I am wondering, by location and leaf shape, whether the second ◄ is *P. auriculata?*

I've given some clues that these specimens are in the south – it was Boxing Day 2014 and we were at Seaward Bush just east of Invercargill: everything of interest is on the smaller loop of the track. ▼

▲Tarris McDonald of Queenstown, with one of the 120mm wide flowers. I'm called this image "Big Mac and Whopper."

As if finding whoppers wasn't sufficient thrill, we then adventured to the walkway at Waituna Lagoon. *Aporostylis, Chiloglottis, Caladenia* and the greatest concentration of *Thelymitra* I have ever seen – thousands fully open in bright ozone-free Foveaux sunlight. ►

Whether or not we found *Thelymitra hatchii*, we did find evidence of a Hatch medal recipient. ▼

Notes etc

Mike Lusk emailed, ▶ "This is from Maungataniwha, roughly west of Wairoa, where a large area of native bush is being protected and an equally large area of pines is being felled and encouraged to revert. I've seen Thelymitra longifolia flowers with a flush of pink and a single one with a flush of blue but never one as spectacular as this (14 December 2014)."

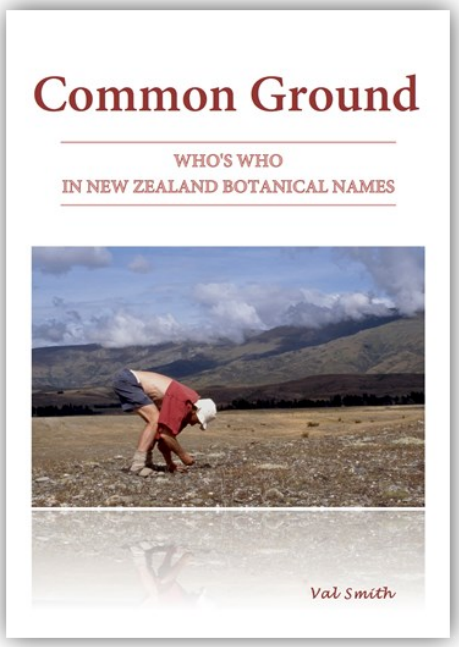
The 8th Australasian Native Orchid Conference & Show will be held at Kempsey, NSW 1–4 September 2016.

The second Colenso Conference, "The New Zealand polymath: Colenso & his contemporaries" will be held in Wellington 16–18 November 2016.

Sau-wan Chan & K Yin Chan 2015. Growing *Sarcochilus* hybrids in clear pots. *Orchadian* 18: 4–8, has just crossed my desk. They noticed that *Sarcochilus* (epiphytes closely related to *Drymoanthus*) suffer root rot in black pots, that roots grow out of the pots and that they do better on bark slabs than in black pots. They surmised that the roots contain chlorophyll and need light, so they ran a trial, with 5 plants in black pots and 5 in clear pots (actually 250ml clear plastic drinking cups. They found stronger root and leaf growth from the plants in clear pots, and no roots growing out of the clear pots the way they did from the black pots. They conservatively conclude, "clear pots can be used in place of black pots, as an alternative to slab mounting for growing some *Sarcochilus* hybrids". *Ingenious: and I imagine the same would be true for any epiphyte whose roots are normally exposed to light—Ed.*

Common Ground:
who's who in New Zealand botanical names

Val Smith



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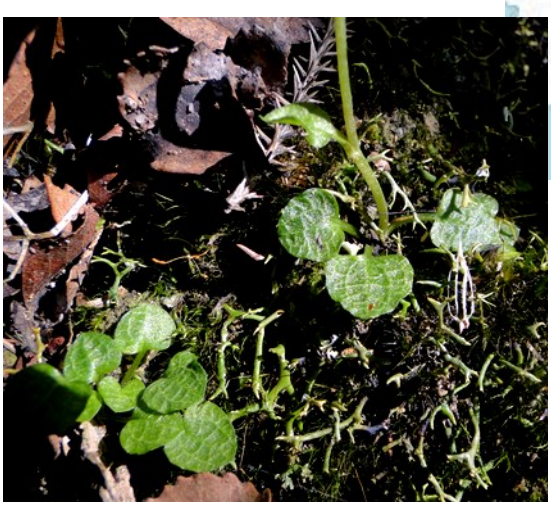
This book brings together the stories of 250 people commemorated in New Zealand botanical names, not only of flowering plants, but also ferns, seaweeds, mosses, lichens and fungi. Arranged chronologically from the Greek philosopher Aristotle, 384 BC–322 BC, (*Aristotelia serrata* – makomako or wineberry) to contemporary New Zealand botanists, *Common Ground* includes early European physicians and herbalists, later explorers and scientists, New Zealand pioneer settlers and visitors, and locally born and educated naturalists.

Price: $30.00 (plus $5.00 postage within New Zealand); **Orders and enquiries to**: Val Smith valdsmit@xtra.co.nz Ph. (06) 758 3521 80 Mill Road Lower Vogeltown, NEW PLYMOUTH 4310

In the July issue of *Kalhari*, Graham Corbin reported a field trip to Mt Maroon where he photographed *Corybas montanus*.
◄

Writing in the July 2015 issue of *Kalhari*, David James notes, "While I was searching the eMonocot's website I also discovered the following relating to *Spiranthes sinensis*. According to the eMonocot's website *Spiranthes sinensis* has no introduced distribution (i.e. it is native to everywhere it is found); a very wide native distribution including Queensland, New South Wales, Victoria, South Australia and Tasmania in Australia as indicated in the map (at right) and *Spiranthes australis* is a synonym of *Spiranthes sinensis*." ►



On 23 August Mary Watson sent this from near Wellington: a flowering *Pterostylis trullifolia* arising from a juvenile rosette. *By the look of the old seed capsule at middle right it flowered last year too. —Ed.*

Looking for orchid books? Pat Enright suggests this site: http://www.hceis.com/home/book_search_result.aspx?en_name=Orchids

At http://onlinelibrary.wiley.com/doi/10.1111/boj.12234/epdf you can see "An updated classification of Orchidaceae" by Mark W. Chase, Kenneth M. Cameron, John V. Freudenstein, Alec M. Pridgeon, Gerardo Salazar, Cássio van den Berg and André Schuiteman. *Botanical Journal of the Linnean Society*, 2015, 177, 151–174. It confirms the nomenclatural changes we adopted in the *Pocket guide.*

At http://www.sciencedaily.com/releases/2015/09/150903131736.htm you can see a review of a paper by Givnish and others which explains, from analysis of chloroplast DNA, the extraordinary diversity of orchids—not on the basis of adaptation to specialised insect pollinators, but on accelerations of speciation beginning 60m years ago (the development of pollinia), 40m (the origin of epiphytism) and 33m years ago (colonisation of mountain rainforests such as the Andes). Now the number of orchid species outnumbers mammals, reptiles and birds combined.

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