

THE HOOKERS  
on the  
NEW ZEALAND  
ORCHIDS



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ORCHIDS**

compiled by Ian St George

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## Introduction

William Jackson Hooker 1785-1865  
Joseph Dalton Hooker 1817-1911

Because the early botanical exploration of Australia preceded that of New Zealand by some years, the early descriptions of some of the orchids common to both countries were based on Australian specimens - those by W.J.Hooker included.

For most of the nineteenth century, William Jackson Hooker and his son Joseph Dalton Hooker were synonymous with botany: their contributions were outstanding.

Hooker senior was born in Norwich, and inherited money. By chance he discovered a rare moss in 1805, and from then on his interest was plants. In 1820 he was appointed Professor of Botany at Glasgow, and in 1841 accepted the Directorship of Kew, a position he held until his death.

He was author of more than twenty major works, and his main interests were ferns, mosses and fungi. He published Floras of Britain, Scotland, and North America, and was a pioneer of economic botany. The books, journals and his herbarium made him the central figure of his subject in Britain.

In 1826 he took over Curtis's *Botanical Magazine*, and the association gave the journal a truly scientific character - no longer merely "a drawing book for ladies" as it had been dubbed earlier. Hooker wrote the papers and executed many of the illustrations for ten years. He was a good artist, and his scientific knowledge no doubt gained from the discipline of minute observation that botanical drawing requires. During this time he illustrated other works as well.

In 1837-40 he published, partly in the *Companion to the Botanical magazine*, and partly in the *Annals and Magazine of Natural History*, Allan Cunningham's *Florae Novae-Zelandiae Praecursor*, our first Flora.<sup>1</sup>

In the preface to his *Handbook of the New Zealand Flora*, his son J.D.Hooker pays tribute to the collectors here who sent specimens to Kew, among them "Dr Munro, who has added many beautiful alpine species to the 'New Zealand Flora', and sent an excellent herbarium of Nelson plants to Sir W.J.Hooker".<sup>2</sup>

The Hocken Library in Dunedin has Munro's lists, and copies of W.J.Hooker's letters and identifications returned to Munro. Munro

included for example, "71, blue orchis from Moutere Hills... 94, pale green orchis... 152, blue orchis near the lake... 164, white orchis crimson bars... 171, yellowish white orchis..."; Hooker tried to identify them in a return letter (and can 164 be right?) "94 orchid... 71, 152, 164, 171 *Thelymitra*".<sup>3</sup>

What is clear from the letters is the reason that the Hookers commanded such devotion from their collectors: W.J.Hooker took no end of trouble to praise and encourage Munro (and even Munro's shepherd, who evidently did a good deal of the collecting);

"It is an uncommon pleasure to us that you do find more than we expected quite new. Some however require further investigation before they are correctly named. The shepherd too has done uncommonly well and should be encouraged to collect by all means. Still I should reckon more on your and Sinclair's climbing Highlands together in search of plants, and I am sure you would make a good harvest".<sup>3</sup>

He had sent Munro the chapters of his son's *Flora* as they came off the press ("You have now the 2 first fasciculi of Dr Hooker Flora of New Zealand [the rest will follow]. I also send a good introductory book or two on botany, and a little notice of the Gardens of Kew").<sup>4</sup> He ended one letter with

"I hope your country is flourishing and will have a good and useful government. My friend Sir G. Grey does not seem to have pleased all parties, - but he is a most accomplished and gentlemanly man - and his wife a perfect lady".<sup>5</sup>

In 1831 Curtis's *Botanical Magazine* carried a paper and a lithograph of W.J.Hooker's beautiful painting of the nodding greenhood *Pterostylis nutans*, the plant "obligingly communicated by Mr. Aiton".<sup>6</sup>

Aiton was the gardener at Kew, and the specimen was collected by Allan Cunningham whom Banks had sent out for plants in Australia. *Pterostylis nutans* has been recorded in New Zealand only from Northland, and not since 1942. It is common in Australia, and has been an occasional migrant to New Zealand on the westerly winds.

The work of Joseph Dalton Hooker is of supreme importance to New Zealand botany. There follows a brief biographical sketch written by E.D.Hatch for a New Zealand Native Orchid Group book (*The New Zealand native orchids - natural history and cultivation*, to be published in 1990):

"J.D.Hooker was the son of Sir William Jackson Hooker, Professor of Botany at Glasgow University, and later the first Director of Kew Gardens. He was Assistant Director of Kew from 1855 until 1865, when he himself became Director, retiring (but not from botany)



in 1885. It was as well that he lived (and worked) til he was ninety-four, for his colonial *Floras* alone were more than a life's work.

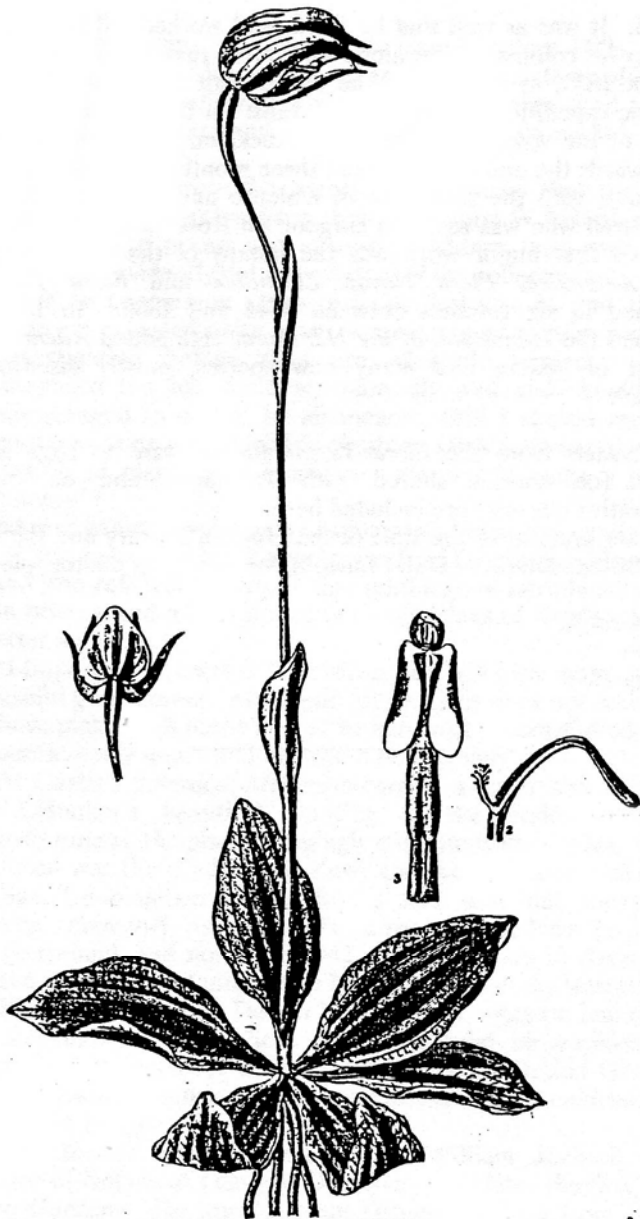
"In 1839, at twenty-two, he sailed with Sir James Clark Ross' antarctic expedition as surgeon-naturalist on the *Erebus*. During the course of the voyage he visited the Auckland and Campbell Islands, and towards the end of 1841 spent three months botanising in the Bay of Islands, with the assistance of Colenso and Andrew Sinclair; and David Lyall who was assistant surgeon on Ross' other ship the *Terror*. Hooker's first major work was the botany of the antarctic voyage; *Flora Antarctica*, *Flora Novae Zelandiae* and *Flora Tasmaniae*, published in six volumes between 1844 and 1860. In 1864-67 he published the *Handbook of the NZ Flora*. He added *Adenochilus* to our list of genera and many new species, mostly discovered by Colenso".

Extracts from the *Flora Tasmaniae* relevant to New Zealand orchids (on species shared with Tasmania, and on those of comparative interest) are included here.

I am grateful to the staff of the Hocken Library and the Library of the Botany Division, DSIR Lincoln, for supplying photocopies.

*Ian St George,*  
*Dunedin*  
*25 April, 1990*

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( 3085 )

PTEROSTYLIS NUTANS. NODDING-FLOWERED  
PTEROSTYLIS.

\*\*\*\*\*

*Class and Order*

GYNANDRIA MONANDRIA.

( Nat. Ord.—ORCHIDÆE. )

*Generic Character.*

*Perianthium* ringens, tetraphyllum, foliolo inferiore bifido (e duobus infra cohærentibus conflato). *Labellum* unguiculatum, subinclusum. *Lamina* basi appendiculata v. gibbosa. *Ungue* infra labio inferiore connato. *Columna* basi galea connata, apice alata. *Anthera* terminalis, persistens, loculis approximatis. *Massæ Pollinis* in singulo loculo binæ, compressæ, pulvereæ. *Stigma* medio columnæ adnatum. *Br.*

*Specific Character and Synonyms.*

PTEROSTYLIS\* *nutans*; foliis radicalibus stellatis, flore nutante, labiis longitudine subæqualibus, galea acuminata, labello apice attenuato truncato.

PTEROSTYLIS *nutans*. *Br. Prodr. Fl. Nov. Holl. v. 1. p. 327.* *Spreng. Syst. Veget. v. 3. p. 715.*

\* Derived from πτερον, a wing, and στυλος, a style, in allusion to the winged style or column.

DESCR. *Leaves* radical, spreading in a stellated manner, oval, rather acute, membranous, striated, reticulated, tapering into a short *petiole*. *Scape* erect, scarcely a span high, erect, glabrous, with about two foliaceous, sheathing *bracteas*, and terminated by a solitary, nodding *flower*: the three upper *segments* of the *flower* are approximate so as to form a helmet, very convex, gibbous at the base, acuminate at the extremity, greenish-white, striated. *Lower segment* (of two combined segments) small in proportion to the rest of the flower, green, with two lanceolato-subulate laciniaë. *Labellum* linear-attenuated, downy, rather thickened and obtuse at the extremity. *Column* green, with two broad, white wings towards the extremity. *Germen* clavate, furrowed.

Introduced to the Royal Gardens at Kew from New Holland, in the year 1826. The drawing was made from an excellent flowering specimen, in September, 1828, and obligingly communicated by Mr. ARRON.

In the direction of the flower, and in the shape of the labellum, this species is altogether different from the *P. curta*, figured in our next plate.

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Fig. 1. Back view of a Flower, *nat. size*. 2. Labellum, with its penicelated appendage. 3. Front view of the Column:—all but fig. 1. *magnified*.

*Note*

*Pterostylis nutans* has not been found in New Zealand since 1942 when Lucy Cranwell found it at Castor Bay.<sup>7</sup>

( 3172 )

**PTEROSTYLIS BANKSII. LARGE-LEAVED  
PTEROSTYLIS.**

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*Class and Order.*

GYNANDRIA MONANDRIA.

( Nat. Ord.—ORCHIDÆÆ. )

*Generic Character.*

*Perianthium* ringens tetraphyllum, foliolo inferiore bifido (e duobus infra cohærentibus conflato). *Labellum* unguiculatum, subinclusum. *Lamina* basi appendiculata v. gibbosa; *ungue* infra labio inferiore connato. *Columna* basi galea connata, apice alata. *Anthera* terminalis, persistens, loculis approximatis. *Massæ Pollinis* in singulo loculo binæ, compressæ, pulvereæ. *Stigma* medio columnæ adnatum.

*Herbæ terrestres, glabræ. Bulbi nudi, indivisi, caudicem descendentem radiciformem terminantes. Folia nunc radicalia stellata, nervosa, membranacea, scapo bracteato aphylo; nunc caulina alterna radicalibus nullis. Flores solitarii rariusve racemosi, ochroleuci, sæpius majusculi.*

*Div. II. Appendix apice diviso sæpius penicellato. Folia radicalia in planta florida nulla. Caulis foliosus. Br.*

*Specific Character and Synonyms.*

*PTEROSTYLIS Banksii*; caule folioso unifloro, foliis lato-lanceolatis inferne carinatis basi vaginantibus, labello oblongo ovato-subuncinato obtusiusculo columnam æquante, appendice pennicellato. *Cunn. in litt.*

*PTEROSTYLIS Banksii. Brown, in Herb. Banks.*

*PTEROSTYLIS macrophylla. Cunningham, MSS.*

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Francis & Taylor del.

Pub. by S. Curke, Glasenwood, Essex, Aug. 1, 1852

50 111 50

Not having had the opportunity of seeing a living specimen of this extremely rare plant, I am unable to offer a description of it, and which, at best, would have given a very inadequate idea of the plant, in comparison with the accompanying figure, which is from the inimitable pencil of FRANCIS BAUER, Esq. The history of the plant I shall give in the words of Mr. ALLAN CUNNINGHAM, in the letter above quoted, and dated April, 1832. "When I was in New Zealand in 1826, I found on the bank of a stream which is received into the Bay of Islands, a PTEROSTYLIS, remarkable no less for the large size of its cauline leaves, than for its height, which exceeded a foot. On my return to Sidney, I carried with me some roots of this unpublished plant, which I transmitted to Kew, by an opportunity which then offered. There it had been long supposed to be dead, when, to the surprise of all of us, it has thrown up a perfect flower-stem, which I carried to Mr. BAUER, who has not only made a beautiful drawing of it, but has most kindly permitted me to send it to you to publish in the Botanical Magazine."

At this time Mr. BAUER had not examined the grains of Pollen; but when he had done so, and found them to be very different from those of Orchideous plants, he most liberally communicated his exquisite drawing of them through Mr. CUNNINGHAM; accompanying it with the following note: "I have now on the 2d of May, examined the Pollen Grains with PLOESSEL's grand microscope, and, to my great surprise, found a total deviation from those of all the hundreds of specimens of Orchideous plants I have yet investigated. These grains, in their ordinary form, consist of three or four-celled corpuscules, or as Botanists express it, 'e sphæruleis quaternis conflatis' (see BROWN, Prodr. p.

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Fig. 1. A Flower of PTEROSTYLIS; *nat. size.* 2. Front view of the Fructification with the Labellum, *nat. size.* 3. A side view of the same; *nat. size.* 4. A front view of the parts of Fructification, with the Ake forcibly expanded; *magnified two times in diameter.* 5. Front view of the Labellum *magnified two diameters.* 6. Back view of the same, *magnified two diameters.* 7. Front view of the Anther, the Stigmatic Gland, and a small portion of the Columna, *magnified six diameters.* 8. A side view of the same; *magnified six diameters.* 9. Transverse Section of a portion of the Ovarium; *magnified four diameters,* (F. BAUER). 10. Grains of Pollen as described above.

310.). I therefore send you herewith, a sketch of some grains of your plant, which are represented as seen under water, except that at *A*, which is in a dry state, when it appears collapsed. This I consider an important circumstance, and could not be detected by Botanists possessed only of glasses of moderate power."

These grains of Pollen as given here are magnified 570 times lineally, or 324,900 times superficially!

Mr. CUNNINGHAM had named the species *P. macrophylla*: but on showing the drawing to Mr. BROWN, that learned Botanist recognized it as the same with a specimen found by Sir JOSEPH BANKS in New Zealand, at the time he accompanied Captain Cook round the world in the Endeavour, and of which the plant, or the drawing, still exists in the Banksian Museum. Mr. CUNNINGHAM then readily consented to the wishes of Mr. BROWN, that it should bear the name of its first discoverer.

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( 3377 )

**MICROTIS PARVIFLORA. SMALL-FLOWERED  
MICROTIS.**

\*\*\*\*\*

*Class and Order.*

GYNANDRIA MONANDRIA.

( Nat. Ord.—ORCHIDÆ. § ARETHUSÆ. )

*Generic Character.*

*Perianthium* ringens, *foliis lateralibus exterioribus sessilibus, labello suppositis; interioribus subsimilibus, ascendentibus. Labellum* dissimile, oblongum, obtusum basi callosâ. *Anthera* columnam infundibuliformem posticè



terminans, auriculo membranaceo utrinque aucta (unde nomen.) *Massæ Pollinis* utriusque loculi binæ, pulvereæ, basi affixæ stigmatis apice soluto.—Herbæ *glabræ*. Bulbi *indivisi, nudi*. Folium *caulinum unicum, fistulosum, teres, vaginâ longâ*. Spica *multiflora*. Flores *parvi, virescentes, v. albi, labello indiviso v. bilobo*. R. Br.

*Specific Character and Synonyms.*

**MICROTIS** \* *parviflora*; perianthii foliolis inferioribus revolutis interioribusque linearibus, labello lineari-oblongo integerrimo: marginibus nudis; disco dimidii superioris ecalloso, spicæ floribus omnibus approximatis. Br.

**MICROTIS** *parviflora*. Br. *Prodr.* v. 1. p. 321. Spreng. *Syst. Veget.* v. 3. p. 713.

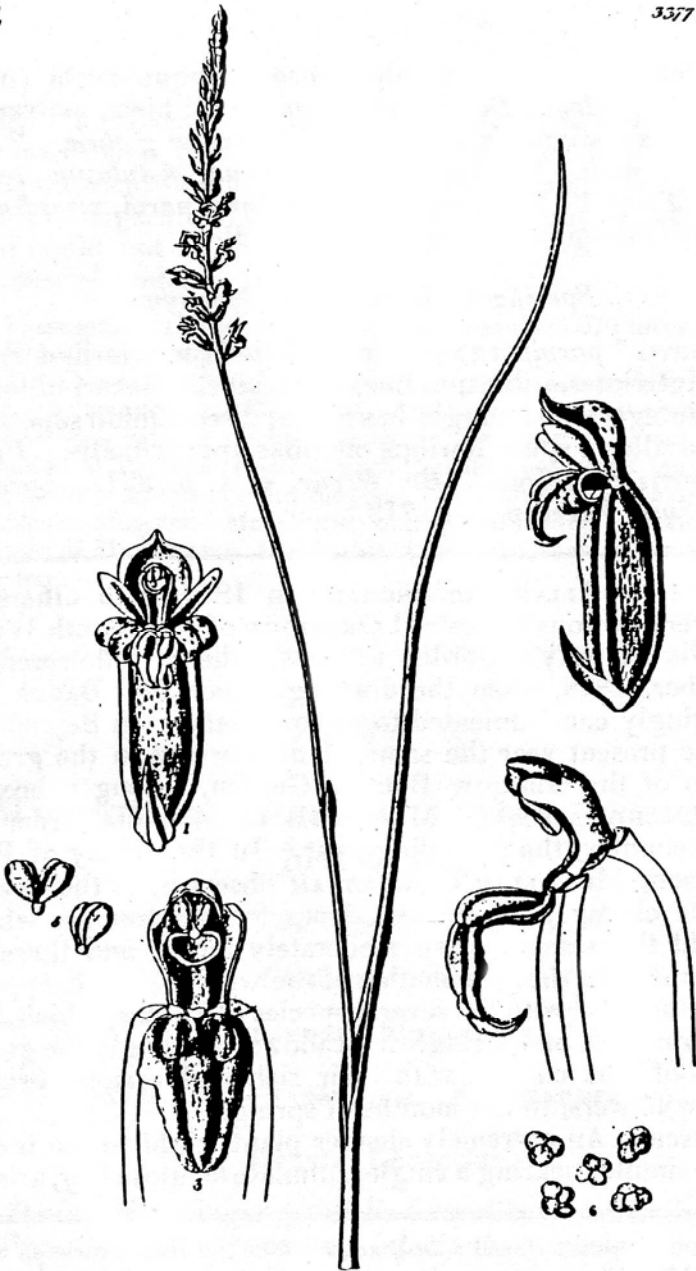
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Sent by ALLAN CUNNINGHAM, in 1824, with others of the very curious terrestrial ORCHIDÆ of New South Wales to His Majesty's Garden at Kew, where it flowered in October, 1828, when the drawing, which Mr. BAUER has obligingly communicated to us, was made. In September of the present year the same plant flowered in the greenhouse of the Glasgow Botanic Garden, among a box of rare ORCHIDÆ sent by Mr. RICHARD CUNNINGHAM from the same country, the preceding year. In the colony of Port Jackson, Mr. ALLAN CUNNINGHAM observes, "the species affects clayey soils in low, damp forest grounds, where, should the season prove moderately moist, and therefore favourable to the reanimation of the whole tribe, it appears in abundance, with the several species of DIURIS, which, like the *Crowfoots* of our English meadows, bespangle the grassy lands of that colony, with their rich and various bright-yellow flowers, in the months of spring."

DESCR. An extremely slender plant, eight to ten inches high, simple, bearing a single, subulate fistulose leaf, arising

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\* From μικρός, *small*, and οὐσῶδες, *an ear*, from the small auricle on each side the column.



from near the middle. *Spike* terminal, of many small, pale green, inconspicuous flowers, each subtended by a small *bractea*. The oblong, angular germen occupies the greater portion of the flower. Upper *sepal* nearly orbicular, concave, acute: two lateral ones linear-oblong and revolute, dotted with red. *Petals* linear, almost white. *Lip* small, linear-oblong, acute, recurved, entire, with two callosities at the base. *Column* short, white, with an auricular appendage on each side at the top, between which the *Anther* is situated.

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Fig. 1. A front, and fig. 2, a side view of the Flower: *magnified* eight diameters. 3 and 4. Front and side views of the Column and Labellum of the same Flower: *magnified* sixteen times in diameter. 5. Front and side views of the Pollen masses, *magnified* sixteen times in diameter. 6. Pollen grains, *magnified* two hundred times in diameter.

In this place may be noticed another species, which Mr. BROWN many years ago, (*Prodr.* 1. p. 320. *in Obs.*) referred to this Genus, but which has not yet been sufficiently defined by Botanists in any work. It is a native of New Zealand; was originally discovered by Sir JOSEPH BANKS in Captain COOK's first voyage of circumnavigation, and was afterwards met with by FORSTER and others. It appears to stand intermediate between Mr. BROWN's *M. rara*, and that eminent Botanist's *M. media*, of which a description and figure is given in the next article, and it may be named and characterized as follows.

*M. Banksii*; perianthii foliis inferioribus ovato-lanceolatis subpatentibus: interioribus lineari-oblongis obtusiusculis, labello oblongo-cuneato lobato: dimidio inferiore dilatato retuso, disco verrucoso, marginibus tuberculato-incrassatis, spicæ floribus præcipuè distinctis, inferioribus distantibus.

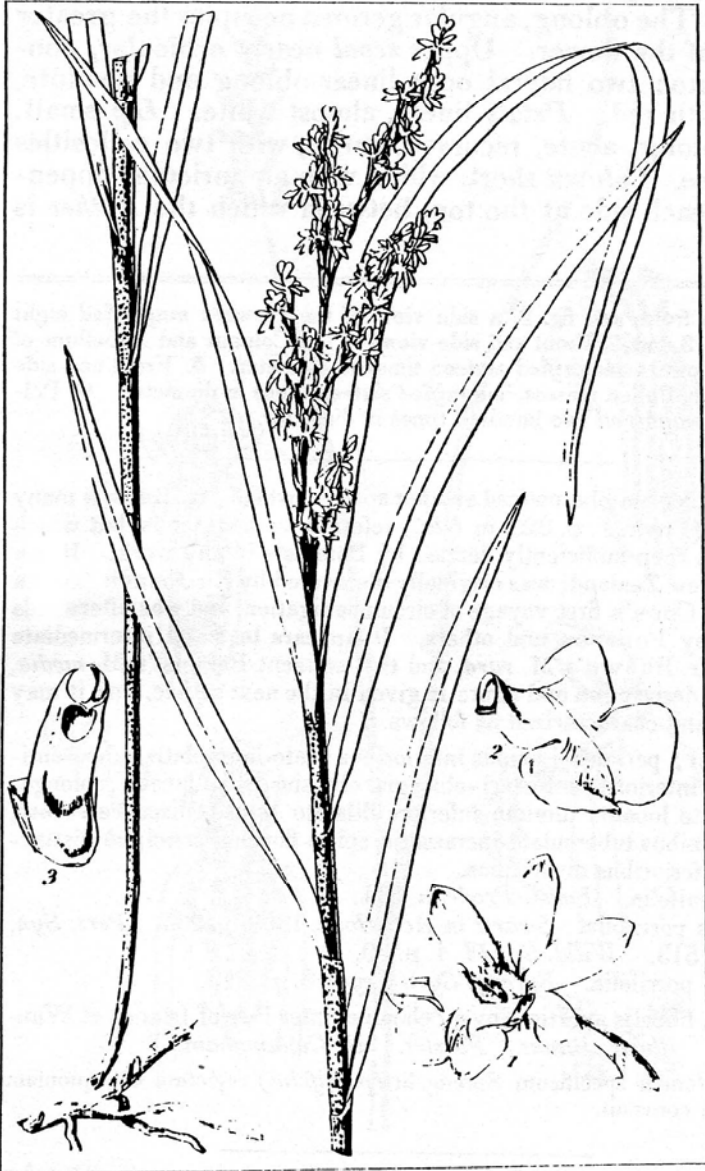
OPHRYS unifolia. *Forst. Prodr. n.* 311.

EPIPACTIS porrifolia. *Swartz in Act. Holm.* 1800. p. 233. *Pers. Syn.* 2. p. 513. *Willd. Sp. Pl.* 4. p. 89.

MICROTIS porrifolia. *Spreng. Syst. Veget.* 3. p. 713.

HAB. in silicetis apertis Novæ Zelandiæ, inter Bay of Islands et Wangaroa, &c. *Illustr. Banks. Forster. R. Cunningham.*

OBS. Nomen specificum Sprengelii (*porrifolia*) rejectum est, quoniam toto genere convenit.



## TAB. CDXXXI.

## EARINA. Lindl.

GEN. CHAR. *Sepala* erecta, æqualia, acuta, membranacea, carinata. *Petala* carnosa, obtusata. *Labellum* carnosum, posticum, cucullatum, trilobum, disco nudo, cum columnâ continuum et subparallelum. *Columna* teres, nana, stigmatis obliqui labio inferiore prominulo. *Clinandrium* proclive. *Anthera* bilocularis. *Pollinia* 4, preparia cohærentia, collateralia.—Herba *caulescens*; *rhizomate articulato, repente*. Folia *linearia, disticha, vaginantia*. Flores *parvi, paniculati, bracteis cartilagineis, striatis, auriculatis*. Lindl.

*Earina mucronata*. Lindl. in *Bot. Reg. sub t.* 1699.

*Epidendrum autumnale*. Forst. *Prodr. n.* 319.

*Cymbidium autumnale*. Sw. *Nov. Act. Ups. p.* 72. Rich. *Fl. N. Zel. p.* 169.

HAB. New Zealand, Northern Island, Sir Jos. Banks. Moist woods, on rocks and trees, Bay of Islands, Wangaroa, &c. A. and R. Cumingham, W. Colenso, Esq. Dusky Bay. Forster.

I believe the general structure of the flower, as here represented, is correct; but the specimens did not allow of so accurate an analysis as I could have wished. Professor Lindley refers the genus to the group of *Malaxideae*.

Fig. 1. Flower. f. 2. Labellum. f. 3. Column:—magnified.

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**Note**

It is interesting that Hooker described *Earina mucronata* under the Family name *Colensoanae*, a tribute no doubt to William Colenso. The name has disappeared.

XXVI. ORCHIDÆ, *Juss.*

1. *CHILOGLOTTIS cornuta*, Hook. fil.; perianthio ringente, foliis inferioribus linearibus obtusis canaliculatis, interioribus erectis ovato-lanceolatis acutis dorsali ovato-lanceolato acuminato, labello trulliformi versus apicem attenuato disco 6-glanduloso, glandula intermedia basali (appendix labelli) porrecta subrecurva.

HAB. Campbell's Island; on the decaying roots of trees in shaded places, rare: *D. Lyall, Esq.*

*Radix* tuberosa; tuberibus 2, pisiformibus, remotis, caudice elongato, radiciformi, descendente connexis. *Folia* 2, petiolata, patentia v. subrecurva, ovata, v. ovato-lanceolata, subacuta, 1-1½ unc. longa, ¼-½ unc. lata, nervis parallelis, venisque transversalibus reticulata, planiuscula. *Petiolii* erecti, ¼-½ unc. longi, basi vaginantes, vagina scariosa, integra. *Scapus* erectus, gracilis, brevis, ¼ uncialis, medio bracteatus, uniflorus. *Bractea* spatheacea, ovata, acuminata, membranacea, florem immaturum amplectens. *Flos* una cum ovario ¾ unc. longus, erectus. *Perianthium* obliquum, foliola omnia erecta; exteriora v. sepala subaequalia, *superius* v. *dorsale* paulo majus, concavum, vix cucullatum, ovato-lanceolatum, longe acuminatum, apice subulatum, sub 5-nerve; *inferiora* labello supposita, ima basi lata, deinde linearia, obtusa, curvata, marginibus involutis, superiore æquilonga; *foliola interiora* sive petala erecta, ovato-lanceolata; exteriora breviora, submembranacea, trinervia, versus apices subserrulata v. undulata. *Labellum* erectum, unguiculatum, petalis paulo brevius; lamina planiuscula trulliformis, vel triangulari-cordata, attenuata, basi truncato-biloba, breviter petiolata, disco 6-glanduloso; *glandulae* v. tubercula valde prominentes, 4 laterales subquadratae, compressæ, squamæformes, duæ prope basin, aliaque altius sitæ; intermediarium basali (v. appendicula) supra discum elata, porrecta, cornu referens, et recurva, antice canaliculata; quinta trilobata. *Columna* erecta, modice arcuata, valida, superne bifida, bialata, alis angustis. *Anthera* apice recurva.

An glandulae laterales labelli vere clavatae, siccitate tantum compressæ et quasi squamæformes?

This is a very interesting plant, belonging to an Australian genus of which only two species were previously known. I have never seen it alive, and am therefore unable to give a coloured figure of the plant. In Tasmania two species grow at the foot of Mount Wellington, in a latitude however much below that of Campbell's Island and in a widely different climate. The flower is smaller than that of *C. Gunnii*, Lindl., to which, of the two other species, the present is, on account of the erect petals, most nearly allied. I am inclined to think that the glands on the disc of the labelium will be found to prove a variable character. In one Tasmanian species they bear the most striking resemblance in form and colour to an ant.

2. *THELYMITRA stenopetala*, Hook. fil.; foliis petiolatis lineari-lanceolatis gradatim acuminatis, scapo 1-2-floro, perianthii foliolis lanceolatis acuminatis, cuculli lobulis lateralibus plumosis, capsulis inclinatissimis paulo curvatis lineari-oblongis.

HAB. Lord Auckland's group; in woods and on the bare ground in exposed places, not uncommon.

The leaves of this plant are dark green, very coriaceous, about 4 inches long and 3-4 lines in breadth, gradually attenuated below into a narrow sheathing petiole. The scapes of the former year, bearing the fruit and crowned with the withered, persistent perianth, were found along with the young leaves. The capsules are shortly pedunculate, pale brown, ½-¾ of an inch long; the column considerably curved, the lateral lobes each with a tuft of hairs.

I have closely compared my very indifferent specimens of this plant with the several species of New Zealand and Tasmania, and have no hesitation in describing it as new.

3. *THELYMITRA ? uniflora*, Hook. fil.; perianthii foliolis exterioribus ovato-oblongis acutis, interioribus obovato-lanceolatis breviter acuminatis, labello late obovato-spathulato subcuneato basi depresso, cuculli lobulis lateralibus erectis apice bifidis medio uninerviis imberbibus, anthera subterminali.

HAB. Lord Auckland's group; on the bare ground and growing in tufts of moss, *Forstera*, &c., on the bleak hills.

Of this species I possess only the old scapes, which are about six inches long, each bearing a solitary capsule, with the withered perianth. The leaves I have never seen, but there are traces of sheaths or leaves on the scape, and of a larger one, probably a *bractea*, below the flower. The capsule is turgid, elliptical-obovate, erect, about half an inch long and quite glabrous. The leaflets of the perianth are rather shorter than the capsule and strongly nerved, as is the *labellum*, which is rounded at the lower extremity, with a short apiculus. The anther is inserted a little below the apex of the column.

I am very uncertain as to the genus of this plant; it differs from any with which I am acquainted; yet I am unwilling, in the absence of better specimens, to constitute a new one of it. In the petaloid, very distinct lateral lobes of the column, which is 3-cleft nearly to the base, it shows some analogy to *Diuris*, and in the terminal anther to the group which includes *Caladenia* and many other New Holland *Orchideae*. The regular and nearly equal leaflets of the perianth, to which the *labellum* is very similar in form and structure, induce me to retain it among *Thelymitra*. It is further undoubtedly nearly allied to a plant included by Mr. Gunn under the genus *Macdonaldia* (vid. Lindl. Swan River Botany, p. 50. no. 217, and Gen. and Sp. Orchid. p. 385), which contains two Tasmanian species, one *M. Smithiana*, Lindl. (*l. c. t. 9. B.*), in which the column is undivided or obliquely trifid or three-lobed; the rounded anther is situated below the apex of the column, on its inner face, and is villous; in the colour and appearance also of the plant, and in the shape of the leaflets of the perianth, it differs from *Thelymitra*. The other species, *M. cyanea*, Lindl., very much resembles the more ordinary forms of *Thelymitra* in size, habit, colour, and in the shape of the perianth; in the more terminal acute anther, and in the lateral lobes of the column being produced upwards beyond the anther and bifid at the apex, it agrees with the *T. ? uniflora*.

4. *CALADENIA* sp. ?; folio lineari acuto parce glanduloso-piloso, perianthii foliolis subaequilongis dorsali late ovato acuto lateralibus ovato-lanceolatis interioribus lanceolatis subacutis, labello subquadrato unguiculato disco nudo.

HAB. Lord Auckland's group; amongst moss in the woods near the sea.

This apparently belongs to the genus *Caladenia*, but it is in a very young state, and the glands on the *labellum* are probably undeveloped. The roots are small, oblong tubers, connected by a terete *cauliculus*. Leaves  $\frac{1}{2}$ -2 inches long. The only flowers I possess are just emerging from a large cucullate *bractea*; they are of a pale flesh-colour mixed with yellow.

5. *CALADENIA* sp. ?; foliis ovato-lanceolatis acutis parce piloso-glandulosis seu glabriusculis, perianthii foliolis exterioribus extus glandulosis lateralibus linearibus obtusis dorsali latiore, interioribus anguste linearibus obtusis, labello obovato-cuneato basi seriebus 2 glandularum ornato.

HAB. Lord Auckland's group and Campbell's Island; amongst moss in the woods, not uncommon.

What I take to be the leaves of this plant (for though growing along with the scapes they were not attached to them) are solitary or rarely two together, arising from a short *cauliculus* terminating in an elongated tuber and throwing out stout horizontal fibres from its lower extremity. The withered scapes, which bear solitary capsules, are 2-3 inches long; the capsules half an inch long, oblong-turbinate, obscurely glandular, and crowned with the reflexed leaflets of the perianth. In one specimen the *labellum* was furnished with only four glands in two lines; in another they extended to the middle with four or six in each series.

6. *ACIANTHUS rivularis* ? A. Cunningham, *Prodr. Flor. Nov. Zel. in Hook. Comp. Bot. Mag.* vol. ii. p. 376. *Lindl. Gen. et Sp. Orchid.* p. 397.

HAB. Lord Auckland's group and Campbell's Island; on mossy banks in the woods, common.

I have seen neither flower nor fruit of this plant, and only a withered capsule of what I believe to be Mr. Cunningham's *A. rivularis*, gathered in New Zealand by Mr. Colenso. The leaves of the former vary very much in size and shape according to their age; the younger ones are cordate or ovate and cordate at the base, acute; as they grow older they become orbicular, deeply lobed at the petiole, of the same size and texture and similarly nerved as in the genus *Acianthus*.

*Dubii generis.*

The following species I am unable to refer to any genus, the flowers being too imperfectly developed for a satisfactory determination.

7. Tuberibus didymis obovatis ad collum fibras validas horizontaliter emittentibus, caule erecto basi vaginato, vagina elongata integra ore abrupta tenuissime scariosa, folio solitario lineari-elongato semiterete superne canaliculato crasso et subcarnoso basi fesso scapum vaginante, scapo 3-5-floro, floribus spathaceo-bracteatis ut in *Orthocerate*, perianthii foliolis valde immaturis subæqualibus exterioribus late ovatis acutis, interioribus paulo angustioribus, labello late obovato nudo, columna semiterete lobis lateralibus nullis, anthera majuscula terminali.

HAB. Lord Auckland's group; in woods near the sea, not uncommon.

Tubers about 3 lines long, similar to those of *Orchis latifolia*, but much smaller; from these the leaf springs at once, its petiole surrounded by a tubular cylindrical sheath. The leaf is 6-8 inches long, 1-2 lines wide, acute or blunt at the apex, green, and of a singularly thick and fleshy texture when recent, coriaceous when dry and quite black. The young scape is covered with what appear sheathing cucullate bracts; they arise one from the base of each of the flowers; the latter are very small.

8. Foliis solitariis (rarius binis) lineari-lanceolatis acutis valde concavis coriaceis nervis parallelis basi vaginatis, scapo ut videtur bibracteolato, flore immaturo solitario, perianthii foliolo dorsali late ovato subacuto cucullato lateralibus interioribusque linearibus obtusis, labello ovato disco obscure 6-7-glanduloso, anthera terminali.

HAB. Lord Auckland's group; in woods, rare.

The leaves here are 2-3 inches long, very concave; the petiole inclosed in a long scarios sheath which is split above; the flower is small and inclosed in two sheathing bracts. This plant has some points in common with *Chiloglottis*, Br., but the leaves are not like those of that genus.

*Notes*

*Thelymitra stenopetala* is *Thelymitra longifolia*. *Thelymitra uniflora* is *Thelymitra cyanea*. The "*Caladenia* sps". referred to cannot be identified from the descriptions. The leaves of the *Acianthus rivularis* described here appear to be those of what we now recognise as *Corybas rivularis*.<sup>8</sup> Under "*Dubii generis*", No 7 may be *Aporostylis bifolia*, and No 8 is *Lyperanthus antarcticus*, as Hooker noted on page 544.

p. 69. *THELYMITRA* ? *uniflora*.—After the description add:—folio solitario tereti canaliculato.

A specimen of this plant, collected by M. le Guillou in Lord Auckland Island, is in no better state of flower than those I gathered, the leaf is, however, in good preservation and similar to that of some other *Thelymitrae*.

p. 71. Orchid. "*dubii generis*" n. 8.

1. *LYPERANTHUS Antarcticus*, Hook. fil.; folio lanceolato acuminato, perianthii foliolo dorsali galeato acuto lateralibus interioribusque parvis angusto linearibus, labello recurvo marginibus erectis disco plicato sub 6-glanduloso.

Though somewhat different in habit from the New Holland species, I do not think that this can be generically separated from them. The flowers are shorter and less expanded, and the upper sepal larger and more galeate, the remainder smaller than in its congeners. The description is completed from M. le Guillou's specimens, in which the foliage is imperfect.



## NAT. ORD. LXXXVI. ORCHIDEÆ, Juss.

## Gen. I. EARINA, Lindl.

*Perianthii* foliola patentia, subcarnosa, subæqualia. *Labellum* posticum, cucullatum, 3-lobum, columnæ subparallellum, basi sub-2-tuberculatum, disco nudo. *Columna* nana, stigmatis labio inferiore prominulo. *Anthera* 2-locularis. *Pollinia* 4, ceracea, collateralia, per paria cohærentia.—Herbæ epiphytica, caulescentes; rhizomate articulado, repente; foliis rigidis, distichis; floribus racemosis paniculatisve; bracteis cucullatis.

Rigid epiphytical plants, growing in great tufts on the branches of trees, etc. *Rhizoma* creeping, sending out long white simple fleshy or hard roots. *Stems* compressed, simple, erect, covered with distichous, linear, coriaceous, green leaves. *Flowers* in terminal simple or branched bracteate racemes, small, white. *Perianth* of six nearly equal pieces, all spreading; *sepals* equal, oblong, subacute; *petals* ovate, more fleshy, blunt; *lip* three-lobed, retuse, lateral lobes curved inwards. *Column* short. *Pollen-masses* four, united, in pairs, to a very small strap-shaped caudicle, powdery.—This genus is confined to New Zealand. (Name from *επιρως*, spring-flowering.)

1. *Earina mucronata*, Lindl.; caule gracili ancipiti, foliis longe lineari-ligulatis acuminatis, panicula gracili, sepalis lineari-oblongis, labello profunde 3-lobo. Lindl. *Gen. et Sp. Orchid. A. Cunn. Prodr. Epidendrum mucronatum*, Banks et Sol. *MSS. et Ic.*

HAB. Throughout the Islands, as far south as Otago, Banks and Solander, etc.

*Stems* slender, 1-3 feet long, two-edged. *Leaves* 4-6 inches long,  $\frac{1}{2}$  broad, acuminate. *Panicle* slender, sparingly branched. *Bracts* remote, obtuse. *Flowers*  $\frac{1}{2}$  inch diameter; *sepals* and *petals* linear-oblong; *labellum* deeply lobed, spotted.

2. *Earina autumnalis*, Hook. fil.; caule robusto lente compresso, foliis linearibus rigidis subacutis acuminatisve, panicula subdisticha ramosa, sepalis late oblongis, petalis late ovatis, labello obtuse 3-lobo subquadrato. *Epidendrum autumnale*, Banks et Sol. *MSS. et Ic.*

HAB. Throughout the Islands, to Stewart's Island, Banks and Solander, etc.

A shorter, more robust plant than *E. mucronata*. *Stems* 1 $\frac{1}{2}$  foot high, slightly compressed. *Leaves* 2 $\frac{1}{2}$ -3 $\frac{1}{2}$  inches long,  $\frac{1}{2}$  broad, rigid, nerved and striated, sharp or acuminate. *Panicle* rigid, rarely simple, usually with many diverging many-flowered distichous branches. *Bracts* crowded, imbricated. *Flowers* white, speckled. *Sepals* broadly oblong. *Petals* ovate. *Labellum* broad, obscurely three-lobed, retuse.

## Gen. II. DENDROBIUM, L.

*Perianthii* foliola membranacea, patentia. *Sepala* lateralia majora, obliqua, cum pede columnæ connata. *Labellum* pede columnæ articulatum v. connatum, sessile. *Columna* semiteres, basi longe producta. *Anthera* 2-locularis. *Pollinia* 4, per paria collateralia.—Herbæ epiphytica, caulescentes.

A very large Tropical Asiatic genus, of which several species are found in Australia and Polynesia, and one in New Zealand. *D. Cunninghamii* is a tufted epiphyte, with masses of cylindrical white roots on trunks of trees, etc., and numerous, pendulous, slender, wiry, polished, branching stems, 1-2 feet long. *Leaves* numerous, distichous, 1-1 $\frac{1}{2}$  inch long,  $\frac{1}{2}$  broad, linear, acuminate, striated, pale green, three-nerved. *Flowers*  $\frac{1}{2}$  inch broad, in axillary, slender, branched, two- or more-flowered racemes, which are shorter than the leaves. *Pedicels* slender, bracteolate. *Leaflets* of the perianth nearly equal in length. *Sepals* acute, upper narrower, lower broad, united at the base together, and with the base of the lip, into a blunt prominent spur. *Petals* oblong, blunt. *Lip* continuous with the base of the column; claw long, connate with the lower sepals; lamina three-lobed; outer lobes small, middle broad, retuse, or truncate, broader than long, undulated; disc with five lamellæ.—This species is allied to the Polynesian *D. biflorum*, Sw., of Otaheite. (Name from *δενδρον*, a tree, and *βίος*, life; in allusion to the epiphytical habit.)

1. *Dendrobium Cunninghamii*, Lindl.; caulibus pendulis fasciculatis ramosis gracilibus teretibus foliosis, foliis distichis linearibus acuminatis striatis 3-nerviis, pedunculis gracilibus 2-4-floris folio brevioribus, sepalis ovatis acutis, petalis oblongis subacutis, labello 3-lobo, lobis lateralibus parvis obtusis, intermedio amplo undulato retuso, disco 5-lamellato. Lindl. in *Bot. Reg. sub 1756. A. Cunn. Prodr. D. bi-*

florum, *A. Rich. Flor. non Swartz.* Epidendrum biflorum, *Forst. Prodr.* E. ramosum, *Banks et Sol. MSS. et Ic.*

HAB. Throughout the Islands, as far south as Stewart's Island, *Banks and Solander, etc.*

### Gen. III. BOLBOPHYLLUM, *Thomars.*

*Sepala* subæqualia; lateralia obliqua, pede columnæ connata; *petala* plerumque minora. *Labellum* pede columnæ articulatam, unguiculatum, sæpius integrum et posticum. *Columna* nana, antice 2-cornis. *Anthera* 1-2-locularis. *Pollinia* 4, valde inæqualia.—Herbæ *epiphytica*; rhizomate *repente, pseudobulbifero*.

This genus abounds throughout the Tropics, but few species have been found south of those limits. The New Zealand *B. pygmaum* is one of the smallest, and forms flat mossy masses of interwoven creeping rhizomata and long fibrous roots on the limbs of trees. *Pseudo-bulbs* rounded, the size of a pepper-corn. *Leaf* solitary, sessile, linear-oblong, coriaceous,  $\frac{1}{2}$  inch long, grooved down the middle. *Flowers* very minute, solitary, on a bracteate pedicel rising from the base of the pseudo-bulb. *Ovary* short, turgid, gibbous, hairy. *Upper sepal* hooded, sub-acute; *lateral* very broadly ovate, acute, united with the claw of the labellum into a blunt prominent spur. *Petals* linear-oblong, blunt, shorter than the sepals. *Lip* with an articulate, ovate, blunt lamina; disc with thickened lines down the centre. *Column* very short, with two prominent teeth in front. (Name from *βολβος*, a bulb, and *φυλλον*, a leaf.)

1. *Bolbophyllum pygmaum*, Lindl.; rhizomate intertexto repente, pseudobulbis depressis, folio lineari-oblongo subacuto, pedunculo 1-floro bracteato folio æquilongo, ovario turgido perianthioque minimo pilosis, sepalis late ovatis acutis, petalis minoribus obtusis, labelli lamina ovata obtusa, disco sublamellato. *Lindl. Gen. et Sp. Orchid. A. Cunn. Prodr.* Epidendrum, *Banks et Sol. MSS. et Ic.*

HAB. Throughout the Islands, as far south as Dusky Bay, *Banks and Solander, etc.* Nat. name, "Piri-Piri," *Col.*

### Gen. IV. SARCOCHILUS, *Br.*

*Perianthium* carnosum; *sepala* subæqualia, obtusa, lateralia basi cum labelli basi connata; *petala* minora, obtusa; *labellum* columna continuum, calcaratum, calceiforme, lobo intermedio carnosio solido. *Columna* brevis, erecta, semiteres. *Anthera* 2-locularis. *Pollinia* 4, ceracea, per paria arete cohererentia, in caudicula latiuscula, glandulæ stigmatis affixa, sessilia.—*Epiphytica*; caule *brevi*; foliis *distichis*.

A small genus of New Holland and Malayan epiphytical plants, of which one species inhabits New Zealand.—*S. parviflorum* is a short-stemmed herb, with very long fibrous aerial roots, running along the trunks of trees. *Leaves* three to five, distichous, shortly sheathing at the base, coriaceous, linear-oblong, blunt,  $1\frac{1}{2}$ -2 $\frac{1}{2}$  inches long. *Flowers* very small, fleshy, rather crowded in axillary pedunculate racemes, which are shorter than the leaves, white speckled with purple. *Bractæ* membranous, shorter than the germen. *Sepals* broadly oblong, blunt, lower broadest, united below to the base of the lip. *Petals* smaller, oblong, blunt. *Lip* continuous with the base of the column, very thick and fleshy, orbicular, very concave, margin recurved, blunt, with a thick, lobed callus at the lower end; disc concave, with thickened ridges. *Column* short. *Anther* two-celled. *Pollens* four, waxy, globular, closely united in pairs, seated on a flat broad caudicle, which is fixed by a broad gland to the stigma. (Name from *σαρξ*, flesh, and *χελος*, a lip.)

1. *Sarcophilus adversus*, Hook. fil.; caule brevissimo, foliis lineari-oblongis obtusis, racemis multifloris, floribus minimis, sepalis petalisque late oblongis obtusis, labello concavo, disco lineis incrassatis aucto apice calloso. *Epidendrum adversum*, *Banks et Sol. MSS. et Ic.*

HAB. Northern Island. Oporagi, *Banks and Solander.* Bay of Islands and Wairarapa, *Elgerley, Colenso.*

### Note

*Sarcophilus adversus* is now *Drymoanthus adversus*.

## Gen. V. PRASOPHYLLUM, Br.

*Perianthium* ringens; *sepala* distincta v. basi coherentia; *petala* inæquilateralia; *labellum* posticum unguiculatum, indivisum, ecalcaratum. *Columna* trifida, lucinis lateralibus (staminodiis) membranacis integris bifidisve. *Anthera* dorsalis; *loculis* 2 approximatis. *Pollinia* 2, apice stigmatis affixa, pulverea. —Herbæ terrestres monophyllæ v. aphyllæ; floribus parvis; caule vaginato; foliis fistulosis; radice tuberosa.

Terrestrial Australian, Tasmanian, and New Zealand plants, with fleshy round tuberous roots and simple stems: leafless, or with one fistular leaf. *Flowers* spiked, green, small, spreading. *Sepals* distinct, or the two lower united below. *Petals* smaller, with the nerves nearer one margin. *Lip* superior, clawed; lamina thick and fleshy, without lobes, appendices, or spur. *Column* trifid; lateral lobes erect, large, membranous, entire or divided. *Anther* placed behind the column, two-celled. *Pollens* two, granular, two-lobed. (Name from *πρασος*, green, and *φυλλον*, a leaf.)

1. *Prasophyllum Colensoi*, Hook. fil.; caule supra medium foliato, folio racemum superante, ovariis obovatis tumidis, bractea parva obtusa pedicellum æquante, sepalis obtusis posticis basi connatis, labello breviter unguiculato trulliformi apice incrassato subacuto, anthera obtusa, columnæ lobis lateralibus brevissimis inæqualiter 2-lobis.

HAB. Northern and Middle Islands, common. East Coast and interior, *Colenso*. Canterbury, *Lyall*.

*Root* a round tuber, with thick fibres at the crown. *Stem* erect, a span to a foot long, slender or robust, with a membranous sheath at the base, and one long leaf, sheathing half-way up. *Raceme* many-flowered. *Flowers* small, sweet-scented; bract as short as the pedicel, blunt; ovary obovate, gibbous. *Perianth*  $\frac{1}{4}$ — $\frac{1}{2}$  inch long. *Lower sepal* oblong, blunt; two back ones joined at the base; *petals* smaller, linear, blunt; *lip* ovate, with a short claw and thickened point. *Column* very short, with very low two-lobed lateral pieces. *Anther* blunt.

2. *Prasophyllum tunicatum*, Hook. fil.; caule gracili basi vagina fibrosa tunicato, folii vagina cauli æquilonga, lamina brevi racemi dimidium æquante, bracteis obtusis pedicello æquilongis v. ovarium subcylindraceum elongatum  $\frac{1}{2}$ -æquantibus, sepalis liberis ovato-lanceolatis petalisque longe acuminatis, labello unguiculato, lamina ovato-lanceolata acuminata, staminodiis amplis acuminatis subdentatis, anthera late oblonga longe apiculata.

HAB. Northern Island. East Coast, *Colenso*.

*Stem* slender, covered at the base with a thick brown fibrous coat, and above with the sheath of the leaf, till close to the raceme, where the lamina begins, which is half as long as the raceme. *Ovaries* linear-oblong. *Sepals* all free, and *petals* ovate-lanceolate, acuminate. *Labellum* narrow, with a long claw. *Staminodia* large, sharp, toothed. *Anther* broadly oblong, with a long point.

3. *Prasophyllum pumilum*; radice tunicata, caule gracili basi vagina membranacea, folii vagina cauli æquilonga, lamina brevi racemi dimidium æquante, bracteis parvis ovario breviter obovato  $\frac{1}{4}$ -æquantibus, floribus minimis, sepalis liberis late ovatis acuminatis, labello unguiculato, disco carnosio incrassato margine membranaceo, columnæ lobis lateralibus amplis 2-3-dentatis, anthera late oblonga mucronata.

HAB. Northern Island, *Elgertley*. East Coast, *Colenso*.

The smallest New Zealand species; a span high. *Tuber* coated with reticulated fibres. *Stem* with a membranous sheath below, also covered throughout its length with the long sheath of the leaf, whose lamina is shorter than the raceme. *Flowers* bent down, minute, with very short ovaries. *Sepals* broad, acuminate. *Lip* jointed on to a long claw, linear-ovate, with a broad fleshy disc. *Wings of the column* large, broad, 2-3-toothed. *Anther* broadly oblong, mucronate.

4. *Prasophyllum nudum*, Hook. fil.; caule vagina folii incluso, lamina brevissima acuta, bracteis brevibus obtusis, ovariis subcylindraceis, sepalis 2 posticis breviter connatis petalisque ovato-lanceolatis acuminatis, labello longe unguiculato, lamina lanceolata acuminata, staminodiis profunde bifidis, anthera breviter mucronata.

### Note

*Prasophyllum tunicatum* was later relegated to synonymy with *Prasophyllum nudum* by Hooker in the *Handbook*.

HAB. Northern Island. Port Nicholson and Taupo Lake, *Colenso*.

Intermediate between *P. tunicatum* and *P. Colensoi* in most characters, differing from both in the leaf having no lamina. *Ovary* linear-oblong. *Sepals* and *petals* ovato-lanceolate, acuminate, two back sepals connate at the base. *Staminodia* membranous, large, deeply bifid. *Anther* broad, with a short mucro.

#### Gen. VI. SPIRANTHES, *L. Rich.*

*Sepala* lateralia labello supposita, basi brevissime saccata; supremum cum petalis in galeam connivens. *Labellum* breve unguiculatum, columnam brevem amplectens. *Anthera* dorsalis stipitata, rostellum laminatum apice bifido incumbens. *Pollinia* 2, glandulæ communi affixa.—*Herbæ plerumque foliosa, terrestres.*

A large genus of *Orchidææ*, one of the few found in most quarters of the globe. The New Zealand species is a small erect herb, a foot high. *Root* of thick fibres. *Radical leaves* 2 inches long, narrow linear-lanceolate, acuminate, narrowed into a long petiole. *Stem* covered loosely with acute sheathing bracts. *Spike* 1-3 inches long, spirally twisted. *Bracts* ovate, acuminate, nearly as long as the flowers. *Ovary* glandular-pubescent, broadly ovate, gibbous. *Perianth* small; *sepals* puberulous, two lower placed under the labellum, rather saccate below, linear-oblong, blunt; upper ovate, sharp; *petals* linear-oblong, blunt, forming a hood from conniving with the upper sepal. *Lip* oblong, waved and crisped, with two glands at the base, its margins enclosing the short column, which has no staminodia, and a broad two-lobed blunt anther, placed behind the stigma.—This species differs from the *S. australis* of Port Jackson in the narrow labellum. (Name from *σπῆρα*, a spike, and *ανθος*, a flower.)

1. *Spiranthes Novæ-Zelandiæ*, Hook. fil.; radice fibrosa, foliis anguste lineari-lanceolatis petiolatis, caule vaginato, bracteis acuminatis folio subæquilongis, ovario brevi glanduloso-pubescente, sepalis puberulis inferioribus obtusis superiore ovato acuto, petalis lineari-oblongis obtusis, labello oblongo obtuso crispato basi 2-glanduloso.

HAB. Northern Island, *Colenso*.

#### Gen. VII. ORTHOCERAS, *Br.*

*Sepala* lateralia, anguste linearia, erecta; superiore crasso galeato obtuso; *petala* parva, linearia, bifida v. integra, sub galea conniventia. *Labellum* sessile, 3-lobum, breve unguiculatum. *Columna* brevis; staminodiis petaloideis. *Anthera* dorsalis mutica v. acuta.—*Herbæ terrestres, tubere indiviso; foliis filiformibus.*

A very small genus, consisting of one New Holland and one New Zealand species. *Root* a long ovoid tuber. *Stem* rather stout, erect, 1-2 feet high. *Radical leaves* sheathing at the base, filiform. *Stem* sheathed. *Spike* flexuous, four- to eight-flowered. *Bracts* ovate or lanceolate, acuminate, longer than the flowers. *Ovaries* pedicellate, large, linear-oblong, erect,  $\frac{1}{4}$ - $\frac{1}{2}$  inch long. *Perianth* shorter than the ovary. *Lateral sepals* linear, quite erect; upper concave, hooded, fleshy, blunt. *Petals* small, linear-oblong, bifid. *Lip* short, three-lobed, with two glands at the base. *Staminodia* subulate. *Anther* acute. (Name from *ορθος*, straight, and *κερας*, a horn.)

1. *Orthoceras Solandri*, Lindl.; caule erecto, folio filiformi longe vaginato, spica flexuosa 4-8-flora, bracteis acuminatis florem superantibus, petalis parvis lineari-oblongis bifidis, labello 3-loba basi 2-glanduloso, staminodiis subulatis, anthera mutica. *Lindley, Gen. et Sp. Orchid.* O. strictum, *A. Cunn. Prodr. non Br.* *Diuris Novæ-Zelandiæ, A. Rich. Flor. p. 163. t. 25. fig. 1.* *Ophrys cornuta, Banks et Sol. MSS. et Ic.*

HAB. Northern and Middle Islands, abundant in clay soil, *Banks and Solander, etc.* Ascends to 4000 feet at Nelson, *Bidwill.* Nat. name, "Makaika," *Colenso*.

#### Gen. VIII. THELYMITRA, *Forst.*

*Perianthii* foliola omnia conformia. *Labellum* sessile, conforme. *Columna* bifida; anthera postica stigmatæque clinandrio petaloideo inclusa, lobis lateralibus (staminodiis) penicillatis v. nutis. *Pollinia* 4, stigmatæ glandulæ affixa.—*Herbæ terrestres; caule foliato.*

Terrestrial herbs, natives of Australia, Tasmania, and New Zealand. *Tubers* oblong, with long fibres at the crown. *Stem* erect, sheathed at the base, and with one generally long leaf. *Flowers* few, spiked, large. *Sepals, Petals, and Labellum* all similar, the latter sessile. *Anther* posticous and stigma hid in the hooded column, which

is made up of column and connate staminodia; the latter project, and are often terminated by tufts of hairs.—The New Zealand species are so very difficult to distinguish specifically, that it is probable that all belong to one very variable form. I find all gradations in colour, size, breadth of sepals and petals, and in the development of staminodia; the species here described are hence perhaps only marked states. From Mr. Edgerley's note I find that he found the most dissimilar forms connected by intermediate ones. (Name from *Θηλυμύτρα*, in Greek, in allusion to the hooded column capping the anther.)

1. *Thelymitra Forsteri*, Sw.; sepalis petalisque ovatis ovato-lanceolatisve, labello obovato, columna bifida, staminodiis breviter porrectis dense v. parce plumosis columna bifida brevioribus. *Swartz. A. Rich. Flor. p. 165. t. 25. f. 2. A. Cunn. Prodr. Lindl. Gen. et Sp. Orchid. T. longifolia, Forst. Char. Gen. Serapias regularis, Forst. Prodr.*

HAB. Very abundant throughout the Islands, *Banks and Solander, etc.*, to the Southern extreme, *Lyall.*

*Stems* stout or slender, with a membranous sheath at the base, sheathed above the leaf, a span to 2½ feet high. *Tubers* elongate, rarely rounded. *Leaf* with a long sheath, and thick linear or linear-lanceolate lamina, very variable in length and breadth. *Flowers* two to twelve, ½–1½ inch long, sessile or on slender pedicels, bractee ovate or lanceolate, acuminate, as long as the flower, or shorter. *Leaves of the perianth* ½–¾ inch long, ovate or lanceolate, acute or acuminate, dull purple or yellowish. *Column* rounded at the summit, bifid. *Staminodia* shorter than the column, with two projecting scathery teeth.—I have examined this plant very carefully in its living state, collecting handfuls of it in my daily walks about the Bay of Islands, in its many different forms, and have compared 150 dried specimens from various parts of both Islands, and can find no specific difference between the little slender one- or two-flowered plant with broad sepals, yellowish flower, and linear leaf, and the great stout form, 2 feet high, with broad leaf, ten or twelve flowers, nearly 1½ inch long, and lanceolate sepals; the form of the column and staminodia is the same throughout. My *T. stenopetala* (Fl. Antaret.) of Lord Auckland's Group is probably a variety of this.

2. *Thelymitra imberlis*, Hook. fil.; gracilis, caule paucifloro, folio lineari, floribus erectis parvis flavis, bracteis ovario brevioribus, sepalis petalisque late obovato-oblongis acutis, staminodiis columnæ æquilongis apice crenatis nudis v. obscure fimbriatis.

HAB. Northern Island. Bay of Islands, etc., *Colenso, Sinclair, etc.*

*Stems* slender, 4 inches to 1 foot high. *Leaf* narrow linear. *Flowers* few, small. *Bractee* broad, acuminate, shorter than the ovary. *Perianth* yellow, ½ inch long; sepals and petals broad, acute. *Column* as long as the blunt crenate or fimbriate staminodia.

3. *Thelymitra pulchella*, Hook. fil.; caule gracili 3–5-floro, folio anguste lineari, perianthii foliolis late obovatis acutis, labello obuncato, staminodiis erectis ultra columnam porrectis apice fimbriatis dentatisve.

HAB. Northern and Middle Islands, *Colenso. Otago, Lyall.* Nat. name, "Muikaika," *Lyall.*

*Tubers* small, with long fibres at the base of the stem, on which other tubers are formed. *Stem* slender, 1 foot high. *Leaf* very narrow. *Flowers* glaucous, large, pale purple, very handsome; *sepals and petals* obovate, acute. *Lip* broadly obovate, truncate, or wedge-shaped. *Column* shorter than the erect toothed or fimbriate staminodia.—This is a handsome and very distinct form in the structure and length of the staminodia; I have fifteen very good specimens, but it is probable that it will be found to pass into *T. Forsteri*, through the following.

4. *Thelymitra uniflora*, Hook. fil.; folio lineari, caule 1-rarius 3-floro, floribus erectis, sepalis petalisque obovato-oblongis acutis, labello obovato, staminodiis erectis columnæ æquilongis apice inæqualiter bidentatis. *Fl. Antaret. p. 70.*

HAB. Middle and Southern Islands. Milford Sound and Port Preservation, *Lyall.*

A smaller species than the foregoing, a span high. *Leaf* linear. *Flowers* erect, usually solitary. *Ovary* pyriform, with a short bractea. *Sepals and petals* obovate-oblong, acute. *Lip* obovate. *Staminodia* as long as the column, unequally toothed, rarely entire.—A very southern form, originally found in Lord Auckland's Group.

5. *Thelymitra pauciflora*, Br.; gracillima, folio longissime lineari, caule 1–3-floro, perianthii flavili foliolis anguste lanceolatis acuminatis, staminodiis elongatis ultra columnam longe porrectis plumosis, anthera mucronata. *Br. Prodr. Lindl. Gen. et Sp. Orchid.*

HAB. Northern Island, *Colenso.*

I have four specimens of this pretty little plant, which are all of a very slender habit, with narrow ovary, and lanceolate yellow sepals. *Staminodia* very long, slender, erect, curving, much longer than the column, feathery at the tip. *Anther* broadly oblong, with an erect stout mucro.—This looks like a drawn-out state of *T. Forsteri*, growing in long grass or shade. Also a native of Australia and Tasmania.

Obs.—I have received from Mr. Colenso specimens of a *Thelymitra* in acetic acid, resembling *T. Forsteri* in all respects, except that the staminodia are subulate, sharply toothed, and not feathery; they are too soft and decayed for determination, as is often the case with specimens thus pickled.

#### Gen. IX. MICROTIS, Br.

*Perianthium* carnosum. *Sepalum* superius galeatum, lateralia sessilia, labello supposita; *petala* ascendencia; *labellum* subungiculatum, basi bicallosum. *Anthera* terminalis, persistens. *Columna* brevis, biarista. *Pollinia* 4, apici stigmatis affixa.—Herbæ terrestres; floribus minimis, dense spicatis.

An extensive Australian and Tasmanian genus, of which but one, and a highly variable species, inhabits New Zealand; it much resembles *Prasophyllum Colensoi*, but the flowers are smaller and not resupinate.—*Root* of one small round tuber. *Stem* 6 inches to 2 feet high, sheathed at the base. *Leaf* solitary, terete, tubular. *Spike* 1-6 inches long, twenty- to eighty-flowered. *Florets* very small, green, sessile,  $\frac{1}{4}$ - $\frac{1}{2}$  inch long. *Bract* very short. *Perianth* minute, fleshy. *Upper sepal* broadly ovate, concave, hooded, two lower placed under the lip, broad, subacute; *petals* small, ascending, blunt. *Lip* oblong, crenate or crisped, blunt or obscurely bilobed, with two lumps at the base and one towards the tip on the disc. *Column* very short, with two broad lateral lobes. *Anther* terminal. (Name from *μικρος*, small, and *οσς*, an ear.)

1. *Microtis porrifolia*, Spreng.; sepalis lateralibus ovato-oblongis acuminatis, supremo late galeato apice recurvo, petalis linearibus oblongis obtusis, labello oblongo basi 2-callosio apice retuso marginibus subcallosio-undulatis disco verrucoso. Spreng. Syst. Veg. M. Banksii, A. Cunn. in Bot. Mag. fol. 3377, et Prodr. Linll. Gen. et Sp. Orchid. Epipactis, Swartz. Ophrys unifolia, Forst. Prodr.

HAB. Abundant throughout the Islands, Banks and Solander, etc. Port William, Lyall.

#### Gen. X. ACIANTHUS, Br.

*Sepala* aristata, lateralia labello supposita, angustiora. *Petala* suberecta v. reflexa. *Labellum* dissimile, porrectum, basi bicallosum. *Columna* semi-teres, elongata, arcuata. *Anthera* terminalis, opercularis. *Pollinia* 4, per paria coherentia.—Herbæ terrestres, tenella, sylvicole, 1-foliata, paucifloræ.

A small genus of Australian and Tasmanian very delicate herbs, found in mossy places in deep woods. The New Zealand species has been found also in Lord Auckland's Group, and is very closely allied to the Australian *A. fornicatus*, but differs in the lip being less glandular.—*Tubers* round, formed at the end of long thick fibres. *Stems* 1-3 inches high, with one broadly cordate, acute, deeply two-lobed leaf,  $\frac{1}{4}$ - $\frac{1}{2}$  inch broad. *Racemes* of two to six green flowers. *Bracts* broad, acute. *Ovarium* oblong. *Perianth* 2 lines long. *Sepals* all aristate; upper broad, three-nerved; lateral narrow, longer, one-nerved, toothed below the arista. *Petals* small, lanceolate, acute. *Lip* ovate-lanceolate, with two lumps at the base and a warted thickened apex. *Column* slender, curved, not winged. *Anther* terminal. (Name from *ακς*, a point, and *ανθος*, a flower.)

1. *Acianthus Sinclairii*, Hook. fil.; folio late cordato acuto profunde bilobo, racemis 2-6-floris, bracteis late ovatis acutis, sepalis aristatis supremo late oblongo 3-nervi, lateralibus linearibus elongatis infra aristas oblique 2-dentatis, labello ovato lanceolato basi bicalloso apice acuto verrucoso.

HAB. Common throughout the Islands, Sinclair, etc.

#### Gen. XI. CYRTOSTYLIS, Br.

*Perianthium* sub-2-labiatum; foliis linearibus. *Sepalum* supremum erectum, lateralia deflexa; *petala* suberecta v. reflexa. *Labellum* breve unguiculatum, planum, declivum, basi 2-callosum. *Columna* semi-teres, superne alata. *Anthera* terminalis. *Pollinia* 4.—Herbæ terrestres, sylvicole, tenella, tuberosæ, 1-foliata, paucifloræ; perianthio explanato.

A very small genus of delicate green herbaceous Australian, Tasmanian, and New Zealand plants, with tuberous roots, slender stems, solitary, broad, cordate leaves, and few-flowered racemes of expanded somewhat two-lipped

greenish flowers. *Upper sepal* and *petals* narrow, erect, or ascending, the latter sometimes reflexed; two lower sepals also narrow, deflexed. *Lip* deflexed, with an oblong membranous lamina, a short claw, and two lumps at the base. *Column* curved, winged above. *Anther* terminal. (Name from *κυρτος*, curved, and *στυλος*, a style.)

1. *Cyrtostylis oblonga*, Hook. fil.; folio ovato-oblongo obtuso apiculato basi cordato sessili rarius in petiolum brevem angustato, labello obovato-oblongo apice rotundato v. retuso apiculato.

HAB. Northern Island. Frequent in moist woods and on shady banks, *Sinclair*, *Colenso*, etc.

*Leaf* from near the root,  $\frac{1}{2}$ –1 inch long, oblong-ovate, blunt, apiculate, generally deeply cordate at the base, rarely narrowed into a blunt petiole. *Flowers* usually one or two,  $\frac{1}{2}$  inch long from tip of upper sepal to that of lip, yellow-green, with a membranous red-brown tip. *Sepals* and *petals* very narrow. *Lip* oblong, tip often rather dilated, retuse and apiculate.

2. *Cyrtostylis rotundifolia*, Hook. fil.; folio orbiculari obtuso profunde cordato, labello lineari-oblongo obtuso v. subacuto.

HAB. Northern Island. Raukawa Ridge, Hawkes's Bay, and Cape Kidnapper, *Colenso*.

Very similar to *C. oblonga*, but smaller, shorter, with an orbicular leaf, blunt and cordate at the base, and narrower lip, rather narrower at the base than above; the latter organ is however a variable one in *C. oblonga*.

3. *Cyrtostylis macrophylla*, Hook. fil.; folio amplo orbiculari obtuso v. apiculato, floribus majusculis, labello lineari-oblongo obtuso.

HAB. Northern Island. East coast, *Colenso*.

A much larger species than either of the former. *Leaf* 1–1½ inch broad. *Stem* 2–5 inches high. *Flowers*  $\frac{1}{2}$ –¾ inch long, from the upper sepal to end of labellum; the latter is narrow, linear-oblong.

#### Gen. XII. ADENOCHILUS, Hook. fil.

*Perianthium* subbilabiatum, puberulum; *sepalum* supremum subgaleatum, acuminatum, basi dorso columnæ adnatum; lateralia labello supposita, lanceolata, acuminata, obliqua, trinervia; *petala* suberecta, lineari-lanceolata. *Labellum* breve unguiculatum; lamina subquadrata, triloba, lobo intermedio caudato discoque glandulis stipitatis sub-1-seriatis ornato. *Columna* elongata, alata; alis ultra antheram productis, apice subdentatis. *Anthera* terminalis, 2-locularis.—Herba gracillima, glaberrima, habitu Eriochili; caule medio unifoliato; folio sessili, ovato, acuto; pedunculo gracili, 1-floro, medio 1-bracteato; ovario erecto, valde elongato, basi bractea vaginante incluso; flore flavido.

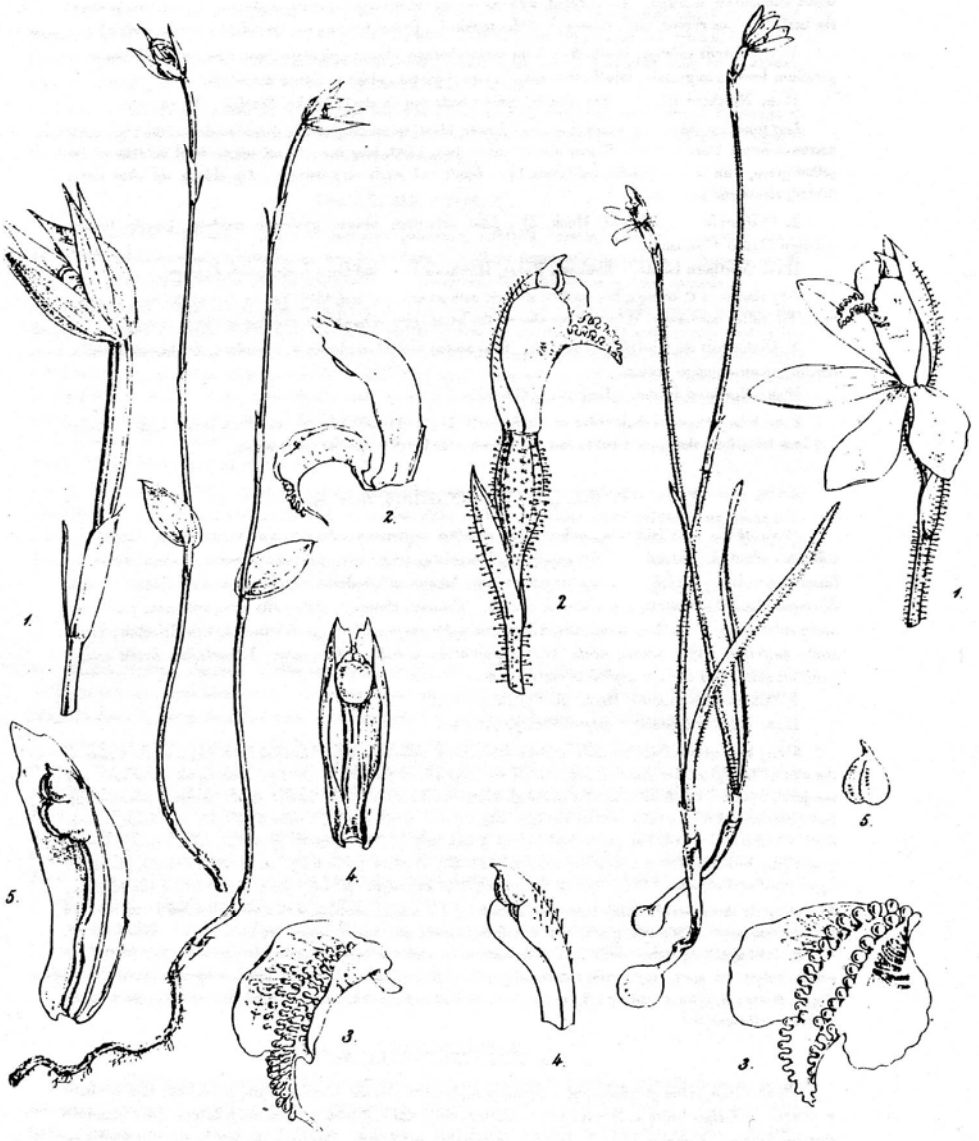
1. *Adenochilus gracilis*, Hook. fil. (TAB. LVI. A.)

HAB. Northern Island. Bay of Plenty, *Colenso*.

A very curious plant, intermediate between *Chiloglottis*, *Caladenia*, and *Eriochilus*; differing from the former in the solitary leaf, glandular perianth, and want of the appendix at the base of the lip; from *Caladenia* in habit and two-lobed column; and from *Eriochilus* in the glandular labellum and sessile lateral sepals, agreeing however with that genus remarkably in habit, and in the very long ovary. *Stems* slender, a span high, with one ovate, oblong, acute, membranous, sessile leaf, placed half-way up,  $\frac{1}{2}$  inch long. *Flower* solitary, glandular, erect. *Ovary* slender,  $\frac{1}{2}$  inch long, surrounded with a sheathing bract at the base. *Perianth*  $\frac{1}{2}$  inch long; leaflets all acuminate, glandular. *Upper sepal* hooded, adnate to the base of the column as in *Pterostylis*; lateral longer, placed under the labellum, free, obliquely three-nerved. *Petals* lanceolate, spreading. *Lip* oblong-quadrate, with a short claw and a long recurved tail; several rows of stipitate glands run down the lamina, and are continued on to the tail. *Column* curved, winged, bifid at the top, lobes toothed. *Anther-case* adnate, hidden behind the broad stigma on the face of the column below the apex, very broad, two-celled. (Name from *αδην*, a gland, and *χιλος*, a lip).—PLATE LVI. A. Fig. 1, flower; 2, column and lip; 3, lip; 4, front view of column; 5, lateral view of column with one wing removed.—all magnified.

#### Gen. XIII. CALADENIA, Br.

*Perianthium* extus glandulosum. *Sepalum* supremum planum v. cucullatum, lateraliibus basi connatis v. liberis. *Labellum* breve v. longius unguiculatum, integrum v. 3-lobum, apice angustatum, disco glandulis seriatis ornato. *Columna* alata. *Anthera* terminalis, persistens. *Pollinia* 4, per paria coherentia.—Herbæ terrestres; radice tuberosa; caule 1–2-phylo; floribus glandulosis-puberulis.



Fitch del. et lith.

F. v. f. imp.

A *Adenocaulis gracilis*, Hook. fil.

B. *Caladenia minor*, Hook. fil.



Terrestrial tuberous-rooted herbs, more or less glandular. *Leaves* one or two. *Flowers* solitary or several. *Upper sepal* plane or hooded; two lateral free or joined at the base; *petals* narrow. *Lip* with a claw, rarely sessile, entire or three-lobed, sometimes narrowed; disc with two or more rows of stipitate glands. *Column* curved, winged. (Name from *καλος*, beautiful, and *αδην*, a gland.)

1. *Caladenia minor*, Hook. fil.; patentim glanduloso-pilosa, radice basi que caulis tunicata, folio anguste lineari glabrato, scapo medio bracteato, flore roseo basi bracteato, sepalis linearibus obtusis petalis angustioribus, labello latiore quam longo profunde trilobo lobis lateralibus membranaceis intermedio late subulato margine glanduloso, disci glandulis 2-seriatis stipitatis, anthera ad apicem columnæ sessili. (TAB. LVI. B.)

HAB. Northern Island. Dry clay hills, abundant, *Edgerley*, etc.

The smallest New Zealand species, 4-8 inches high, very slender, one-flowered, covered with spreading patent glandular hairs. *Leaf* solitary, very slender, linear. *Flower* nearly erect,  $\frac{1}{4}$  inch broad, pink.—PLATE LVI. B. Fig. 1, flower; 2, flower with the sepals and petals removed; 3, lip; 4, column; 5, anther:—all magnified.

2. *Caladenia Lyallii*, Hook. fil.; radice tunicata, folio radicali anguste lineari, caule pilis patulis glanduloso medio 1-bracteato 1-2-floro, floribus bracteatis, sepalis lineari- v. obovato-oblongis acuminatis, labello lobo intermedio brevi subulato recurvo.

HAB. Middle Island. Otago, *Lyall*.

A very much larger-flowered and stouter species than *C. minor*, with one to two flowers, each twice as large as in that species, and broad sepals, which are linear-oblong, or obovate and acuminate. (This is probably the *Caladenia* No. 4 of 'Flora Antarctica,' p. 70.)

3. *Caladenia? bifolia*, Hook. fil.; glanduloso-pubescent, foliis 2 basi caulis suboppositis ovato-oblongis subacutis, scapo nudo, flore solitario basi bracteato, sepalis petalisque linearibus, labello vix unguiculato late obovato basi glandulis 2-seriatis ornato, columnæ breviter alata, anthera ad apicem columnæ sessili.

HAB. Middle Island. Otago, *Lyall*.

This is apparently the Orchideous plant No. 5 *Caladenia?* of Lord Auckland's Group mentioned in the 'Flora Antarctica,' p. 70, and differs from *Caladenia* in the almost sessile labellum.—Whole plant glandular,  $\frac{1}{4}$  inches high, robust. *Root* of small tubers and thick large fibres. *Leaves* nearly opposite, sessile, 1 inch long, ovate-oblong. *Scapo* with one bract below the flower. *Ovary* obovate,  $\frac{1}{4}$  inch long. *Flower* rather large,  $\frac{1}{4}$  inch across. *Sepals* and *petals* linear, blunt. *Lip* obovate, with two short rows of linear glands near the base. *Column* with narrow wings and the anther at the top.—This differs from *Caladenia* in having two leaves, but the upper of them is represented in the other species of the genus by the bract on the middle of the scape.

#### Gen. XIV. PTEROSTYLIS, Br.

*Perianthium* ringens, membranaceum. *Sepalum* superius cum *petalis* in galeam cohærens; laterales basi connata. *Labelllum* unguiculatum, subinclusum, basi gibbosum v. appendiculatum. *Columna* basi cum galea adnata, apice alata, medio stigmatifera. *Anthera* terminalis, persistens. *Pollinia* 4, compressa.—Herbæ tuberosæ, terrestres, foliata; floribus majusculis, membranaceis, viridibus.

A large Australian and Tasmanian genus of herbaceous, delicate, membranous, or succulent transparent green plants.—*Leaves* rosulate or sheathing up the stem. *Flowers* solitary in all the New Zealand species, usually large and green. *Upper sepal* concave, attached at the base to the back of the column, conniving with the linear petals to form a hood over the column; *lateral sepals* combined at the base, or up to the middle. *Lip* clawed, narrow, included in the perianth. *Claw* with a callus or a curved appendix. *Column* usually slender, winged above, with the stigma on the face about half-way up. *Anther* terminal. (Name from *πτερος*, a wing, and *στυλος*, a column.)

1. *Pterostylis Banksii*, Br.; caule folioso, foliis lineari-lanceolatis carinatis longe acuminatis, flore magno, perianthii foliolis longe caudatis, labello lineari basi appendicula curva lineari-clongata apice villosa. *Bot. Mag. t.* 3172. *A. Cann. Prodr.* *Lindl. Gen. et Sp. Orchid.*

HAB. Northern and Middle Islands. As far south as Akaroa, *Banks* and *Solander*, etc.

Much the largest and largest-flowered New Zealand species, 6-18 inches high. *Leaves* numerous, sheathing the whole stem, produced much beyond the flowers, narrow, grassy, acuminate. *Flower* 1½-3 inches long. *Sepals* and *petals* produced into very long filiform tails. *Lip* with a long claw, narrow, linear-oblong; *appendix* long, curved, tipped with a pencil of hairs.

2. *Pterostylis australis*, Hook. fil.; caule foliato, foliis anguste lineari-oblongis planis acuminatis, scapo ultra folia elongato, flori erecto, sepalis lateralibus subulatis erectis, supremo petalisque ultra medium decurvis longo acuminatis, labello lineari longo unguiculato, appendicula breviuscula curva apice penicillata.

HAB. Middle and Southern Islands. Port William and Thomson's Sound, *Lyall*.

Nearly as large as *P. Banksii*, but the leaves are shorter, broader, not keeled, reticulated. *Stem* sheathed by the leaves. *Perianth* ½-1 inch long, erect at the base, then suddenly curved downwards. *Lateral sepals* with subulate erect tips. *Upper sepals* and *petals* with long acuminate points. *Lip* as in *P. Banksii*, but the appendix is shorter.

3. *Pterostylis graminea*, Hook. fil.; caule breviusculo foliato, foliis linearibus lineari-lanceolatisve acuminatis, perianthio suberecto lente curvo foliolis acuminatis, labello lineari-oblongo, appendicula breviuscula curva penicillata.

HAB. Northern and Middle Islands. Auckland, *Sinclair*. East coast, *Colenso*. Otago, *Lyall*.

A small species, 4-6 inches high, like a miniature of *P. Banksii*, but without the long tails to the perianth, which is only ¼-½ inch long.

4. *Pterostylis micromega*, Hook. fil.; foliis radicalibus petiolatis lineari-oblongis subacutis, caulinis superioribus vaginantibus, flore (pro planta) magno erecto lente curvo, petalis sepalisque acuminatis lateralibus apice subulatis erectis, labello lineari, appendicula breviuscula apice penicillata.

HAB. Northern Island, *Edgerley*. East coast, *Colenso*.

*Stem* slender, 4-8 inches long. *Radical leaves* few, petiolate, 2 inches long, linear-oblong, hardly acute; *cauline* numerous, upper sessile. *Flower* large for the size of the plant (whence the name), 1½ inch long, erect, curved slightly. *Sepals* and *petals* acuminate; *lateral sepals* with long, erect, subulate apices.

5. *Pterostylis foliata*, Hook. fil.; foliis radicalibus petiolatis elliptico-oblongis obtusis v. subacutis reticulatis, scapo 1-2-foliato, perianthio basi erecto supra medium curvo horizontali, sepalis petalisque acutis, sepalis lateralibus apice subulatis, labello lineari-oblongo, appendice breviuscula apice penicillata.

HAB. Northern Island. Marshy places, East coast, and Ruahine Mountains, *Colenso*.

This is a very handsome species, but, like its congeners, very variable in size: alpine specimens are almost stemless, with three to four sessile radical leaves, a short scape, and a flower hardly exerted beyond them; more generally it is an erect plant, a span high, very like the *P. micromega*, but with larger, more reticulated radical leaves and flowers, whose perianth (½-1 inch long) is erect at the base, and then curved horizontally, with the tips of the petals and upper sepal bent downwards.

6. *Pterostylis trullifolia*, Hook. fil.; pusilla, caule gracili, foliis radicalibus longe petiolatis late ovato-cordatis acutis, scapo 2-3-bracteato, perianthio basi erecto dein decurvo, sepalis lateralibus apice filiformibus supremo petalisque acuminatis, labello lineari, appendice apice penicillata.

HAB. Northern Island. Bay of Islands, *Edgerley*, *Colenso*, etc. Auckland, *Sinclair*.

A very common slender species, 4-6 inches high. *Radical* leaves broadly ovate, cordate, triangular or the form of a trowel, ½ inch long, on slender petioles ¼-1 inch long. *Scape* with two or three small bracts. *Perianth* ½ inch long, erect below, upper half horizontal or decurved; *lateral sepals* with filiform erect points, the other *sepal* and *petals* acuminate; *lip* linear, with a short subulate blunt appendix, villous at the point.

7. *Pterostylis puberula*, Hook. fil.; pusilla, foliis radicalibus confertis breve petiolatis ovatis acutis acuminatisve, scapo glanduloso puberulo 3-bracteato, perianthio basi erecto dein curvo, sepalis lateralibus apice filiformibus supremo petalisque subacutis, labello lineari-oblongo, appendice subulata infra apicem subramosa.

HAB. Northern Island. Auckland, *Sinclair*.

I have several good specimens of this peculiar little species, which is more robust than *P. trullifolia*, with glandular scape, and crowded ovate acute radical leaves on short petioles. *Root* of small tubers, attached to long

fibres. *Leaves*  $\frac{1}{4}$  inch long, with the petioles. *Scape* 2-3 inches high, with three sheathing bracts. *Perianth*  $\frac{1}{2}$  inch long; *lateral sepals* with filiform apices, *upper* and *petals* broad and blunt at the tip; *lip* linear-oblong, broader and more membranous than in the previous species, with a delicate curved appendix, irregularly but sparingly fimbriate or branched towards the tip.

8. *Pterostylis squamata*, Br.; foliis radicalibus confertis ovato-lanceolatis acuminatis, scapo bracteato, perianthio erecto, sepalis lateralibus brevibus linearibus obtusis supremo galeato acuto, petalis anguste lineari-subulatis, columna apice utrinque late alata, alis decurvis margine superiore cornutis. *Br. Prodr. Lindl. Gen. et Sp. Orchid.*

HAB. Northern Island. Auckland, Sinclair.

A very singular and beautiful plant, a native of Tasmania, easily recognized by the filiform lip, fringed with feathery yellow hairs, and thickened into a round purple glandular head, like that of a nail. *Plant* 5-8 inches high. *Leaves* sessile, numerous, crowded, radical, ovato-lanceolate, acuminate,  $\frac{1}{4}$ -1 inch long. *Scape* with sheathing bracts. *Perianth* erect,  $\frac{1}{2}$  inch long; *upper sepal* hooded, acuminate, the narrow petals cohering to its margin; *lateral sepals* deflexed, linear, blunt, shorter than the upper. *Lip* with a curved, villous (sometimes blunt, glabrous) appendix. *Column* with two broad projecting hooked fimbriated wings at the tip, which have a long erect subulate horn.

#### Gen. XV. NEMATOCERAS, Hook. fil.

*Sepalum* supremum cucullatum, lateralia elongata, filiformia, labello supposita, porrecta. *Petala* elongata, filiformia, erecta. *Labellum* maximum, cucullatum, truncatum, fimbriato-lacerum. *Columna* brevis. *Anthera* terminalis.—Herbæ terrestres; caule brevissimo; folio solitario, membranaceo; scapo brevi, unifloro, fructifero elongato; floribus soritide purpureis.

One of the most curious-looking genera of this remarkable Natural Order, similar to *Corysanthes* of Australia, to which it is closely allied.—*Roots* fibrous. *Stems* succulent, sheathed at the base, often appearing like a petiole, from the side of which the flower bursts. *Leaf* broad, sessile or petioled. *Scape* short, with one flower and bract, lengthened in fruit. *Flowers* lurid purple, conspicuous for the filiform slender petals and sepals. *Upper sepal* hooded, lateral filiform, placed under the lip, projecting horizontally. *Petals* filiform, erect. *Lip* very concave, cordate at the base, broader than long, with incurved margins, and many veins, which, projecting beyond the truncate edge, give it a fringed appearance. *Column* short, curved, with a terminal, one-celled, two-lobed anther. *Pollens* four (according to Brown).—The species all require examination in a living state; those described appear remarkably distinct from one another, but more specimens are very much desired. (Name from *νημα*, a thread, and *κερας*, a horn.)

1. *Nematoceras oblonga*, Hook. fil.; folio sessili ovato-oblongo apiculato, scapo ex axilla folii orto, bractea ovario æquilonga, flore parvo, sepalis lateralibus labello quadruplo longioribus, petalis sepalis brevioribus, labello late quadrato cucullato marginibus incurvis apice truncato ciliato-dentato, columna subelongata arcuata. TAB. LVII. B.

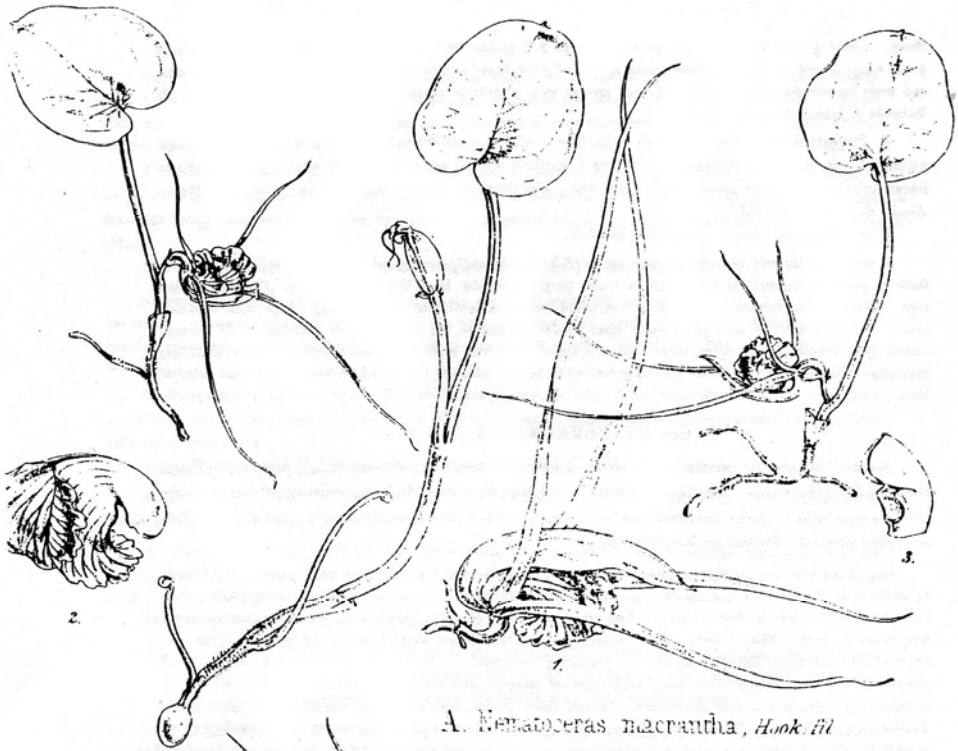
HAB. Northern Island, Cunningham, Edgerley, etc. Mountains of the interior, Colenso. Auckland, Sinclair.

*Root* covered with thick woolly fibres. *Stem*  $\frac{1}{2}$ -2 inches. *Leaf* ovato-oblong, sessile, with an apiculus, sometimes cordate at the base,  $\frac{3}{4}$ -1 $\frac{1}{2}$  inch long. *Scape* short. *Bract* as long as the ovary, leafy, acuminate. *Lateral sepals*  $\frac{1}{2}$ -1 inch. *Lip*  $\frac{1}{2}$  inch, broadly reniform, cordate when spread out, deep blood-red purple, with transparent edges, margin in front sharply toothed, tip subulate. *Column* curved.—PLATE LVII. B. Fig 1, Flower; 2, lip; 3, the same spread open; 4, column:—all magnified.

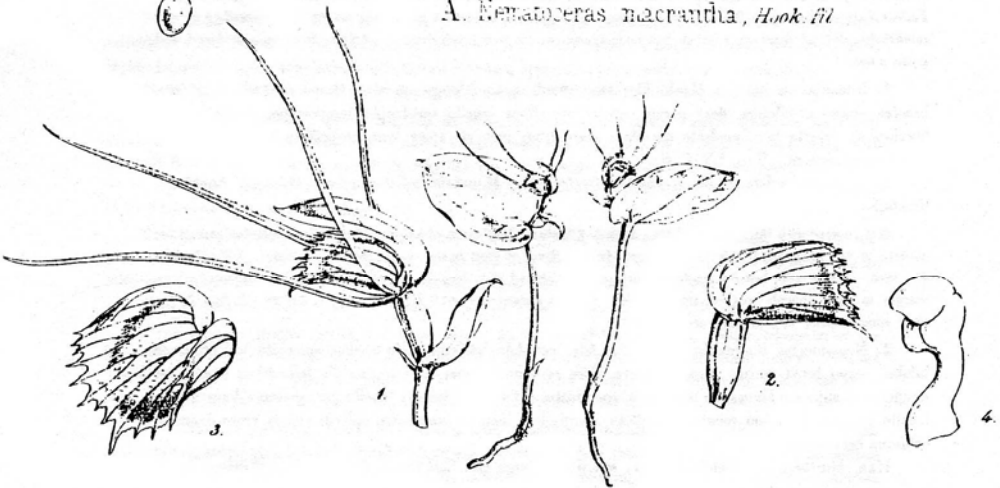
2. *Nematoceras macrantha*, Hook. fil.; folio petiolato late rotundato cordato apiculato basi profunde bilobo, scapo brevi caulino, bractea parva, flore resupinato, ovario curvo, sepalis lateralibus labello ter longioribus supremo lanceolato cucullato acuminato, petalis longissimis labello ter quaterve longioribus, labello maximo latissimo recurvo cucullato marginibus incurvis undulatis apicem versus eroso-dentatis, columna brevissima. TAB. LVII. A.

HAB. Northern and Middle Islands; wet woods, bogs, etc. East Coast, Colenso. Port William, Lyall.

*Stem* very short. *Leaf* petioled, orbicular, cordate, apiculate, deeply two-lobed, 1-1 $\frac{1}{2}$  inch long. *Flower* on a short scape, very large, with filiform lateral sepals two to three times its own length, and very long, slender, erect petals. *Bractea* very small. *Ovarium* short, curved. *Upper sepal* horizontal, lanceolate, acuminate, larger than the



A. *Nematocheras macrantha*, Hook. fil.



B. *Nematocheras oblonga*, Hook. fil.

Arch. de. et. lat.

F. Perce. imp.

lip, which is very much broader than long,  $\frac{1}{4}$  inch long, recurved, deep red-purple, with undulate recurved edges.—  
 PLATE LVII. A. Fig. 1, flower; 2, lip; 3, column:—all magnified.

3. *Nematoceras triloba*, Hook. fil.; folio petiolato late reniformi orbiculato basi profunde bilobo apice 3-lobo, lobo intermedio acuto, scapo caulino petiolo brevior, ovario curvo, sepalis lateralibus labello 5-plo petalisque duplo longioribus, supremo apice dilatato obtuso, labello magno latissimo recurvo fere 2-partito basi 2-auriculato, columna nana.

HAB. Northern and Middle Islands; damp woods. East Coast and interior, *Colenso*.

A smaller plant than *N. macrantha*, with proportionally still longer thread-like lateral sepals and petals. *Leaf* petiolate,  $\frac{1}{2}$  inch across, deeply cordato-reniform, trifid, rarely entire at the point; middle lobe acute. *Peduncle* shorter than the petiole, often much lengthened when in fruit. *Perianth*  $\frac{1}{2}$  inch long; sepals 2 inches; petals half the length of the lateral sepals; upper sepals dilated and retuse at the point. *Lip* very large, of two parallel recurved lobes, and having two curved ears at the base; margins nearly entire. *Column* very small.

4. *Nematoceras rotundifolia*, Hook. fil.; caule elongato, folio rotundato cordato apiculato, scapo ex axilla folii orto brevi, bractea ovario æquilonga.

HAB. Northern Island. Clay banks. Manawatu, *Colenso*.

I regret not having expanded flowers of this curious little plant; those I have in bud resemble *N. oblonga* in size and form of the pieces of the perianth. *Stems* slender, 1-2 inches long. *Leaf* orbicular, cordate, acuminate or apiculate,  $\frac{1}{4}$  inch broad. The flower rises from between the lobes at the base of the leaf in my specimens, but this may not be a constant character. I have leaves of this or a very similar plant from Lord Auckland's Group.

5. *Nematoceras rivularis*, Hook. fil.; folio subsessili ovato-cordato basi bilobo apice retuso apiculato, bractea subfoliacea ovario brevior, flore mediocri, sepalo supremo lineari-oblongo acuminato lateralibus labello duplo longioribus, petalis longissime lineari-setaceis sepalis duplo longioribus, labello trulliformi recurvo marginibus undulatis apice angustato retuso apiculato, columna mediocri. *Acianthus rivularis*, *A. Cunn. Prodr. Linll. Gen. et Sp. Orchid.*

HAB. Northern Island; in shaded ravines. Wangaroa Bay, *A. Cunningham*. Auckland, *Captain Hautain*.

This resembles *N. triloba* very closely, but the leaf is shortly petiolate, and the labellum of a very different form, being trowel-shaped, much recurved, with a retuse truncate apex. The leaf also is longer and ovate.

Obs. I have several species or varieties of this genus, from the Middle and Southern Islands, gathered by Dr. Lyall, and from Lord Auckland's Group; but they are not in a fit state for determination.

#### Gen. XVI. GASTRODIA, Br.

*Perianthii* foliola in tubum apice 5-fidum basi ventricosum connata. *Labellum* posticum, inclusum, liberum, unguiculatum. *Columna* cava, basi antice stigmata. *Anthera* terminalis, decidua. *Pollinia* 4, per paria coherentia.—*Herbæ terrestres, aphyllæ*; scapo *vaginato*; floribus *racemosis*.

A curious genus, belonging to a small section of the family, of which very few species are known; they inhabit dark woods, one in New Zealand, another in Tasmania and Australia. A very few closely allied plants occur in Java, the Indian mountains, and in Siberia; all are leafless parasites, and are of a uniform pale brown colour. *G. Cunninghamii* has a root as thick as the fore-finger, sometimes eighteen inches long, full of starch, and eaten by the natives.—*Stem* 1-2 feet high, stout, bearing here and there semi-plexicaul, obtuse, membranous, alternate or opposite and connate bracts. *Racemes* 6-10 inches long. *Flowers* 20-50, shortly pedicellate, pendulous, with short scarious bracts. *Perianth* tubular, split half-way down the back, gibbous or swollen below, five-toothed,  $\frac{1}{4}$  inch long, fleshy. *Lip* free, clawed; claw winged; lamina linear-oblong, membranous, waved, with two thick ridges down the middle. *Column* very short. *Anther* two-celled, deciduous. *Pollens* two (or four in cohering pairs), of very large grains. *Stigma* a glandular surface in front of the base of the column, communicating by a cavity with the ovarium. (Name from γαστήρ, a stomach.)

1. *Gastrodia Cunninghamii*, Hook. fil.; vaginis inferioribus oppositis connatis, racemo multifloro, labello basi truncato medio 2-cristato apice incrassato obtuso, columna brevissima. *G. sesamoides*, *A. Cunn. Prodr. non Br.*

HAB. Throughout the Islands; in deep woods. From the Bay of Islands, *R. Cunningham*, to Port Preservation, *Lyall*. Nat. name, "Perci," *Col.*

Obs. *Cheiloglossis cornuta* and *Lyperanthus antarcticus*, both natives of Lord Auckland's Group, have not yet been gathered in New Zealand.

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#### Notes

*Caladenia bifolia* is *Aporostylis bifolia*. *Cytostylis macrophylla* and *C. rotundifolia* are *C. reniformis*. *Microtis porrifolia* is *M. unifolia*. *Nematoceras* is *Corybas*. *Orthoceras solandri* is now recognised as *O. novae-zeelandiae*.<sup>9</sup> *Prasophyllum tunicatum* is *P. nudum*. *Pterostylis micromega* has recently been identified with *Pterostylis furcata* by Clements,<sup>10</sup> but most regard it as distinct. *Pterostylis puberula* is *P. nana*. *Pterostylis squamata* is *P. plumosa*. *Sarcochilus* is *Drymoanthus adversus*. *Spiranthes novae-zeelandiae* is currently identified with *S. sinensis*, but a revision of the Australasian *Spiranthes* is under way at present. *Thelymitra uniflora* is *T. cyanea*. *Thelymitra forsteri* is *T. longifolia*. *Thelymitra imberbis* is *T. carnea*.

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# FLORA OF TASMANIA.

## CLASS MONOCOTYLEDONES.

### NAT. ORD. I. ORCHIDÆ.

ONE of the most beautiful and interesting Natural Orders of Australia, abundant in the extratropical latitudes of that continent, and especially in Tasmania, but extremely rare in the tropical. The great majority are terrestrial and tuberous-rooted, but there are a few epiphytical ones, all belonging to the tribe *Vandeeæ*, on the warm and tropical eastern coasts, and one inhabits Tasmania which has been found nowhere else. About 200 Australian *Orchideæ* are known, which are, with few exceptions, endemic. The exceptions are *Spiranthes australis* (S. Novæ-Zelandiæ, *mihî*), found in New Zealand, India, and other countries; a *Prasophyllum*, also found in New Zealand, where a Tasmanian species of *Thelymitra* and of *Culadenia* probably also occur, but these have not been satisfactorily identified. Considerably more than half the Australian Orchids, about 120 species, are confined to the east coast and Tasmania, about 60 being confined to the western, and 15 or 20 are common to the south-eastern and south-western quarters of the continent. Tasmania contains 74 species, all but 8 of which have been found on the neighbouring continent, though of these some are peculiar to it and south-western Australia.

The difficulties attending the analysis and discrimination of the plants of this Natural Order are proverbially great, and the Tasmanian Orchids have proved proportionally more troublesome than any other Natural Order, partly from Mr. Brown having found few of them in Tasmania, and partly from Gunn's splendid series of specimens being accompanied by fewer remarks than usual.

On the other hand I have derived the greatest assistance from Mr. Archer's drawings, notes, and specimens, as well as from his intimate acquaintance with the living plants; his beautiful drawings and dissections are, with his kind permission, and at his expense, lithographed for this Work by Mr. Fitch; and I can only add, that but for his having afforded me the benefit of his accurate knowledge of the species, I should in several cases have failed to discriminate them aright, and in other cases, where I had properly discriminated, to have selected their most important diagnostic characters.

I am also greatly obliged to Dr. Lindley for his ever ready advice and assistance, and for the use of his Herbarium, containing all of Gunn's collections that were published in his valuable 'Genera and Species of Orchidæ.'

To facilitate the recognition of the Tasmanian *Orchideæ*, I give a clavis of the genera, founded on the most prominent characters these present; but a tyro will find it exceedingly difficult to make out any satisfactorily until he has acquired some general knowledge of the majority.

- A. *Anther deciduous, terminal. Pollen waxy.* (Vandææ).
1. GUNNIA.—An epiphyte, with long, tortuous, aerial roots, distichous falcate leaves jointed near the base, and a simple raceme of yellow, sweet-scented flowers (p. 32).
  2. DIPODIUM.—A terrestrial, leafless herb, with a large erect raceme of rose-coloured, spotted flowers. Sepals and petals revolute at the apex (p. 32).
- B. *Anther deciduous, terminal. Pollen granular.* (Gastrodiææ.)
3. GASTRODIA.—A leafless, dirty-white or pale-brown herb, with a fleshy tuberous root, a stem with sheathing scales, and few-flowered raceme of whitish drooping flowers, whose sepals and petals are united into a tubular, ventricose, 5-toothed perianth (p. 31).
- C. *Anther deciduous, terminal. Pollen powdery.* (Arethuseæ.)
- a. *Labellum anticonv.*
    4. MICROTIS.—Slender, erect herbs, with tuberous roots at the base of the stem, narrow linear leaves, crowded spikes of very minute green flowers (p. 24).

5. *ACIANTHUS*.—Small, slender, delicate plants, with long-pedicelled tubers at the base of the stem, one sessile cordate leaf on the stem, and a few racemose brownish flowers, with long points to the sepals and petals (p. 25).
  6. *CYRTOSTYLIS*.—Similar to *Acianthus*, but with the column dilated at the apex (p. 25).
  7. *CHIOGLOTTIS*.—Small herbs, with long underground roots, each terminating in a tuber; two sessile leaves at the base of the scape, and one (rarely two) terminal reddish-brown and green flower, whose labellum bears large, pedicelled, capitate, dark red-brown glands (p. 23).
  8. *ERIOCHILUS*.—A very slender herb, with a long underground root terminated by a naked tuber, one sessile ovate leaf on the scape, and small greenish-white pubescent flowers, having the lateral sepals unguiculate (p. 26).
  9. *CALADENIA*.—Slender, often beautiful herbs, mostly covered with glandular pubescence or long hairs, having a long underground root terminated by a coated tuber, one linear or oblong radical leaf, and a 1-2-flowered scape; flowers often large, with spreading narrow segments, and the labellum studded with pedicelled glands (p. 26).
  10. *GLOSSODIA*.—Small pilose herbs, with the general characters of *Caladenia*, but differing in the labellum being sessile, having no glands, but an erect projection at the very base, close to the column (p. 31).
  11. *PTEROSTYLIS*.—Pale-green, slender, often membranous herbs, with a long underground root terminated by a naked tuber, radical or alternate cauline leaves or none, and solitary or racemose green transparent flowers. Upper sepal galeate. Labellum irritable. Column very long, with auricled wings at the top, and the stigma halfway down its face (p. 18).
  12. *CORYSANTHES*.—A small, singular-looking plant, with a long underground root terminated by a naked tuber; one sessile, broad, cordate leaf, and one almost sessile red-brown flower as large as the leaf, with a very large galeate dorsal sepal, and larger, cucullate, fimbriated labellum. Anther one-celled (p. 15).
  13. *BURNETTIA*.—A very small, stout herb, 2 inches high, with a few alternate leaves, and one or two erect flowers, nearly equal sepals and petals, with involute margins, and a short, broadly-cuneate, papillose labellum (p. 16).
- β. Labellum posticus.*
14. *LYPERANTHUS*.—A short, stout, rather fleshy herb, with a long underground root terminated by a naked tuber, several leaves at the base of the scape, and red-brown racemose flowers. Sepals spreading. Labellum posticus, with crenulate margins (p. 16).
  15. *CALEANA*.—An erect, slender herb, with a fibrous underground root terminated by a naked tuber, one linear leaf, a long scape, few rather large fuscous-green flowers, which have the irritable labellum shaped like a hammer, with the head placed over the flower (p. 8).
- D. Anther persistent, at the back of and parallel to the column, or sunk in a deep notch of the column, its apex pointing forwards and upwards. Pollen powdery. (Neottiae.)*
- α. Labellum anticous.*
15. *THELYMITRA*.—Stout or slender herbs, with one linear leaf, and one- or a few-flowered raceme of flowers, whose petals, sepals, and labellum are nearly equal and similar: the labellum without glands (p. 3).
  16. *DIURIS*.—Generally tall, slender herbs, with several linear radical leaves and few-flowered racemes, linear lateral sepals placed below the three-lobed labellum, and a petaloid staminodium on each side of the base of the column (p. 6).
  17. *CALOCHILUS*.—A stout, erect herb, with leafy stem, a spike generally of reddish-brown flowers, which have the labellum beautifully fringed with long purple hairs (p. 14).
  18. *SPIRANTHES*.—A slender, leafy herb, with a few linear leaves, and twisted spike of small pink flowers (p. 14).
- β. Labellum posticus.*
19. *FRASOPHYLLUM*.—Slender or stout herbs, leafy or leafless, bearing two sessile coated tubers, and spikes of small greenish-yellow or purple flowers. Column short, with the margins expanded into staminodia (p. 9).
  20. *CRYPTOSTYLIS*.—A tall, slender herb, with one radical, petioled, linear-lanceolate, coriaceous leaf, and a few-flowered spike of rather large red-brown flowers (p. 8).



## Tribe I. NEOTTIEÆ.

## Gen. I. THELYMITRA, Forst.

*Perianthium* regulare, foliolis omnibus (labello incluso) conformibus. *Labelium* sessile, nudum. *Columna* bifida, cucullata, trifida, lobo medio emarginato v. trifido, lateralibus porrectis crenatis v. in appendicem apice plumosam productis. *Anthera* persistens, lobo medio columnæ inserta, stigmatibus libero paralleta, inclusa v. semiexserta, bilocularis. *Pollinia* 4, stigmatibus glandulæ affixa.—Herbæ; radicibus plerumque bituberculatis; folio lineari (rarius lanceolato), sæpissime solitario; scapo 2-3-bracteato, apice 1-6-floro; floribus albis cæruleis carneis purpurascensibus flavolisve, sub sole apertis, tempore nubuloso clausis.

This genus may be distinguished at once by the segments of the perianth and sessile labelium being nearly all equal and similar, and by the column forming a rather membranous hood, which encloses the suberect anther. It abounds in extratropical Australia and New Zealand, but is very rare in tropical Australia, and, except one species found in the lofty mountains of Java, none are known to inhabit other countries but those mentioned, though some will no doubt be found in New Caledonia, etc. In the 'New Zealand Flora' I have alluded to the extreme difficulty, if not impossibility, of characterizing the forms of the genus in that country, and there is not less difficulty with regard to some of the Australian ones. Of these Brown enumerates ten, and Lindley twenty-nine (including *Macdonaldia*).

The Tasmanian species, of which Brown had one only, may be reckoned at seven, according to Mr. Archer's and my opinion. Of these, four belong to the very distinct section *Macdonaldia*, which has no plumose appendages to the column, and are very distinct from one another (though it is sometimes difficult to discriminate dried specimens of *T. carnea* and *T. venosa* from small forms of *T. nuda* and *ixioides*). The other three are all extremely variable in size and many minor points, but are, I think, easily referable to *T. nuda*, *angustifolia*, and *ixioides*. Of these three species, *T. ixioides* has the middle lobe of the column truncate, trifid, lacinated, or ercsted, and shorter than the lateral feathery lobes; in *T. nuda* it is hooded, notched or bilobed, and higher than the lateral feathery lobes; and in *T. angustifolia* it is somewhat similar, but with the lobes crenate. The two former of these vary extremely in size and habit, from a slender, thread-like, one-flowered herb, 6 inches high, to a tall, stout herb, 18-24 inches high, with six or seven flowers. The other species (*T. angustifolia*) does not vary so much in form and stature, being usually larger, stouter, and with larger flowers and leaves, but a good deal in the apex of the column, whose lobes are crenate, toothed, or fimbriate, long or short, broad or narrow, and whose lateral lobes with feathery apices are sometimes quite erect, and much longer than at others.

How far a local botanist may be able to discriminate some of these forms of *ixioides* and *nuda* in various parts of the colony (and in South-eastern Australia, where they are all very abundant), it is impossible for me to say; but, after a very diligent study of the column of all Gunn's specimens, and of a most beautiful selected series of Archer's, accompanied with coloured drawings, and dissections of varieties of them, both Mr. Archer and myself have come to the conclusion that the above is a near approximation to the actual number of well-marked forms existing in Tasmania. (Name from *θελυμίτρα*, in allusion to the hooded column; that of *Macdonaldia* was given in honour of Mrs. Macdonald Smith.)

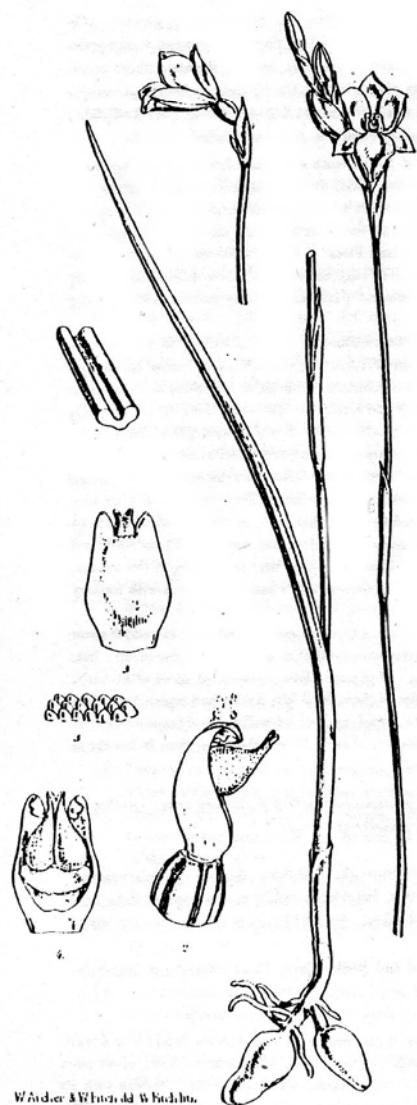
§ 1. *MACDONALDIA*.—Column bifid at the apex, its sides not produced into toothed or feathery arms. *Anther* projecting, generally more or less granular or villous.

3. *Thelymitra venosa* (Br. Prodr. 314); caule strictiusculo 1-3-floro, floribus cyaneis venosis, perianthio connivente, columnæ apicis lobis linearibus involutis, lateralibus nullis, anthera apice biloba basi papillosa.—*Macdonaldia* cyanea et *M. venosa*, *Linll. Bot. Reg. App. 217*; *Gen. et Sp. Orchid. 386*. (*Gunn, 938, 944.*) (TAB. CII. A.)

HAB. Moist ground, flooded in winter. Circular Head and Rocky Cape, *Gunn*; Cheshunt and Port Sorrell, *Archer*.—(Fl. Dec.)

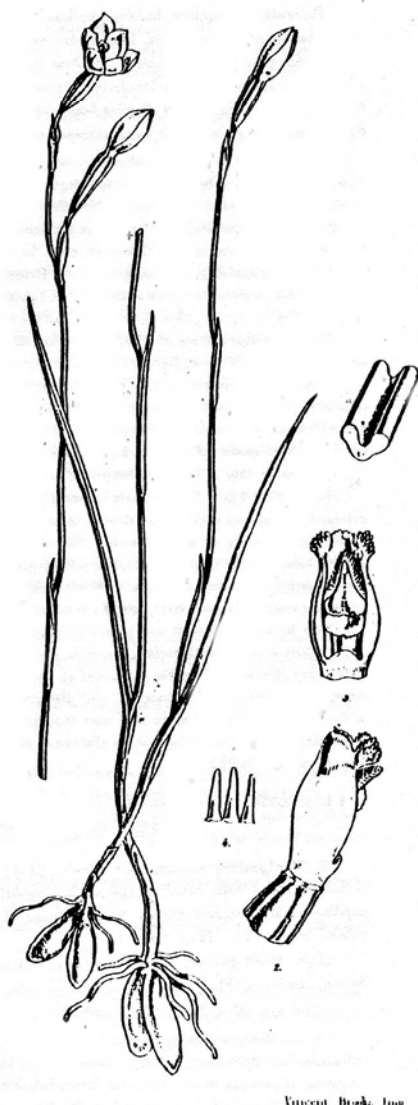
DISTRIB. New South Wales and Victoria.

A very different-looking species from the preceding, larger, taller, with more campanulate bright blue flowers, the scape usually without flexure.—*Stem* 1-2 feet high. *Bracts* two, appressed, with short laminae; upper outer segment of perianth shorter than the inner, two lower longer. *Lip* obovate, rather expanded. *Column* with its bifid apices linear, involute, notched at the tips. *Anther* with an acuminate bifid apex and papillose base.—This varies with white and blue flowers. Lindley describes *T. venosa*, from Bauer's drawings, as having serrulate seg-



Wärdler & Wärdler del. Wärdler lit.

*A. Thelymtra venosa, Br*



Vincenz Broki. Imp.

*B. T. carnica, Br*

ments of the perianth; this is not the case with my Sydney specimens, but Archer tells me that the lip has sometimes small notches along the margin. The Australian specimens have sometimes six flowers, each nearly an inch across.—PLATE CII. A. Fig. 1, section of leaf; 2, side, 3, back 4, front views of column; 4, papillæ of anther:—all magnified.

‡ 2. Column three-lobed at the apex, the middle lobe notched or entire, the lateral projecting forwards and crenulate.

4. *Thelymitra carnea* (Br. Prodr. 519); caule gracili subflexuoso 1-3-floro, floribus roseis parvis, columnæ apice trilobæ lobo medio rotundato crenulato lateralibus porrectis carnosulis crenato-dentatis verrucosisque, anthera subacuta.—Lindl. *Gen. et Sp. Orchid.* 519. (Gunn, 756, 757.) (TAB. CII. B.)

HAB. Near Hobarton, Gunn; Georgetown and Cheshunt, Archer.—(Fl. Dec.)

DISTRIB. New South Wales, Victoria, and Swan River.

A small, slender species, a span to 18 inches high, with the scape strict, or having a strong double flexure, bearing one narrow-linear leaf at the base, and two closely appressed bracts. Flowers two or three, flesh- or rose-coloured, small,  $\frac{1}{2}$  inch across. Segments of perianth acute. Column with a three-lobed apex, the middle lobe truncate or rounded, crenulate, the lateral projecting forwards and upwards, rather thick, toothed and warted. Anther short, blunt.—Except by wanting the feathery apices of the lateral lobes of the column, I cannot distinguish dried specimens of this from small ones of *T. izioides* and *T. nuda*.—PLATE CII. B. Fig. 1, section of leaf; 2, side, and 3, front view of column; 4, basis of anther:—all magnified.

‡ 3. Column three-lobed at the top, the lateral lobes produced into feathery arms, the middle lobe trifid or notched. Anther wholly hidden in the column.

5. *Thelymitra nuda* (Br. Prodr. 314); caule strictiusculo 1-10-floro, floribus pallide cæruleis roseisque, columnæ apice 3-lobæ lobo intermedio fornicato rotundato bifido v. emarginato margine integerrimo laterales breviter porrectos plumosos superante, anthera inclusa apice rotundata apiculata.—*T. pauciflora*, Br. l. c. *T. arenaria*, versicolor et graminea, Lindl. *Gen. et Sp. Orchid.* 519-521. (Gunn, 58, 935, 942, 101 in part, 940, 943, 937.) (TAB. CIII. A.)

Var.  $\beta$ ; columnæ lobo intermedio truncato crenulato.—A species distincta?

HAB. Abundant throughout the Colony, in various soils and localities.—(Fl. Nov.-Jan.) (v. v.)

DISTRIB. New South Wales, Victoria, and South Australia; New Zealand?

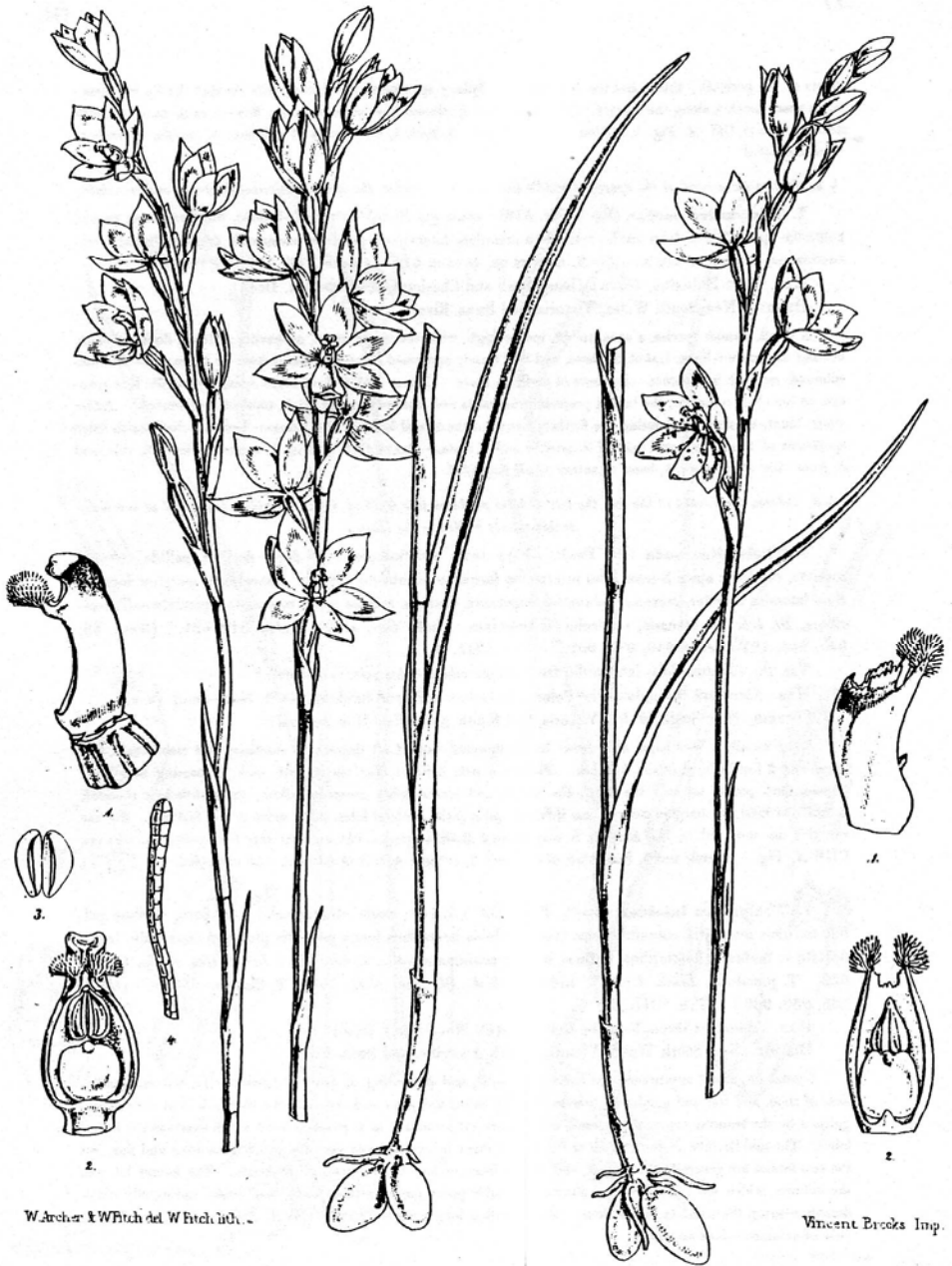
Stems usually a foot high, and three- to six-flowered, but of all degrees of stoutness and slenderness, and sometimes 2 feet high, at others 6 inches. Flowers a pale delicate blue, tinged with pink, or passing into pink. Column dark purple towards the apex; the middle and lateral lobes generally yellow; the middle lobe rounded, notched, or bifid, its margins more or less inflexed, quite entire; lateral lobes short, more or less feathery. For the var.  $\beta$  I am indebted to Mr. Archer: it may prove a distinct species, but we have very few specimens.—PLATE CIII. A. Fig. 1, lateral, and 2, front view of column; 3, anther; 4, hair of column:—all magnified.

7. *Thelymitra izioides* (Smith, Exot. Bot. i. t. 29); caule strictiusculo 1-18-floro, floribus pallide cæruleis maculatis, columnæ apice truncata: lobis lateralibus longe porrectis plumosis intermedio trifido dentato v. fimbriato longioribus, anthera inclusa acuminata.—Br. Prodr. 314; Lindl. *Gen. et Sp. Orchid.* 522. *T. juncifolia*, Lindl. l. c. *T. iridoides*, Sieb. Pl. Nov. Holl. 168. *T. lilacina*, Müller. (Gunn, 935, 936, 939.) (TAB. CIII. B.)

HAB. Abundant throughout the Colony.—(Fl. Nov., Dec.) (v. v.)

DISTRIB. New South Wales, Victoria, South Australia, and Swan River.

Similar in general appearance and habit to *T. nuda*, and presenting as great varieties in size, stature, slenderness of stem, and size and number of flowers, but the latter are paler and spotted with black; it is at once distinguished by the truncate top of the column, which does not terminate in a rounded hood which overtops the lateral lobes. The middle lobe of the column is trifid; the three inner segments are of very irregular form and size, but the two lateral are generally the longest, and all are more or less toothed, cut, or fimbriate. The lateral lobes of the column, which have feathery tips, almost invariably point more upwards than in *T. nuda*, and usually considerably overtop the truncate middle lobe. Anther with a long point.—PLATE CIII. B. Fig. 1, lateral, and 2, front view of column:—both magnified.



A. *Thelymitra nuda*, Br. B. *T. inoides*, Sm.

## Gen. III. CRYPTOSTYLIS, Br.

*Sepala* patentia, lineari-lanceolata, acuminata. *Petala* consimilia sed minima. *Labellum* magnum, posticum, sessile, indivisum; basi concava, columnam brevissimam occultante. *Stigma* ovatum. *Columna* margo membranacea, lacera. *Anthera* stigmati parallela, obtusa, bilocularis. *Pollinia* 4, pulverea.—Herbæ; bulbis *teretibus*, *fasciculatis*, *subarticulatis*; folio *radicali petiolato*, *lineari-lanceolato*, *coriaceo*, *reticulato*; floribus *scapum vaginatum terminantibus*, *spicatis*, *sordide rufis*, *majusculis*.

The species of this genus, of which three are described, are all Australian herbs, but are so closely allied to some East Indian and Malayann Island plants (*Zosterostylis*, Bl.), that it is doubtful whether all these should not be brought into the same genus.—*Flowers* rather large, dusky-red or brownish, spiked, solitary or few. *Radical leaves* strongly net-veined when dry. *Roots* fasciated, of thick, jointed or annulate fibres.—The *C. longifolia* is a tall herb, 10–24 inches high, with one rather coriaceous, flat, radical, linear-lanceolate leaf on a long petiole. *Scape* erect, rather stout, with a few distant, short, sheathing bracts. *Flowers* three to eight, rather distant, sessile, upwards of an inch broad. *Ovary* curved, slender,  $\frac{1}{2}$  inch long, about twice as long as the bracts. *Sepals* narrow-linear, dirty yellow-green, almost an inch long. *Petals* shorter, smaller, more subulate, of the same colour. *Lip* superior (i. e. posticus), pointing forward, its face looking downward, broadly-obovate, oblong, blunt, margins recurved, with three medial ridges terminating in a double tubercle towards the apex, dirty reddish-brown. *Column* very short, hidden in the cucullate base of the lip, its margins expanded, membranous, and torn. (Name from κρυπτος, concealed, and στυλος, a column.)

1. *Cryptostylis longifolia* (Br. Prodr. 317); folio longe petiolato lineari-oblongo v. lanceolato, floribus porrectis, labello obovato-oblongo marginibus recurvis, axi 3-carinato, carinis in processum callosum bilobum desinentibus.—*Limdl. Gen. et Sp. Orchid.* 445; *Bauer, III. Gen. Orchid. t. 17 et 18*; *Endl. Iconogr. t. 17*; *Plant. Preiss. ii. 11.* *Malaxis subulata*, *Lab. Nov. Holl. t. 212.* (*Gunn, 358.*) (Tab. CVIII. A.)

HAB. Marshy places in sandy soil: Circular Head, *Gunn*; Port Sorrell, *Garrett's Sugar-loaf*, and east side of Meander River, *Archer*.—(Fl. Feb.)

DISTRIB. New South Wales and Victoria.

PLATE CVIII. A. Fig. 1, labellum; 2, side, and 3, front view of column; 4, front view of anther and pollen:—all magnified.

## Gen. IV. PRASOPHYLLUM, Br.

*Perianthium* ringens. *Sepala* lateralia postica, distincta v. basi coherentia. *Petala* inæquilateralis, sepalis subæqualia. *Labellum* posticum, unguiculatum, ascendens, indivisum, ecalcaratum, sæpius lamina adnata margine libera auctum. *Columna* basi utrinque laciniis lateralibus (staminodiis) suffulta. *Anthera* mutica, antica, loculis approximatis. *Pollinia* 2, biloba, apicibus stigmatibus affixa.—Herbæ terrestres, glabræ; tuberibus indivisis; folio *radicali*, *lineari*, *basi vaginato*, *tereti-fistuloso*, *rarius brevissimo*; floribus *parvis*, *rufescentibus flavilibus viridibus fuscisve*, *dense v. laxo spicatis*.

A large genus of very variable plants, confined, so far as is at present known, to Australia and the New Zealand Islands. The species may readily be recognized by their coated bulbs, which are not pedicelled, solitary fistular leaves, and spike of small flowers, which have the labellum above. Mr. Archer has made a detailed study of the Tasmanian species, and I have gladly availed myself of his arrangement and characters of the species; these appear to me good, though I must own it is not possible to find in all the dried specimens of any species all the characters we agree in considering to be the diagnostics of that species: still the difficulties are not nearly so great in this genus as in *Microtis* and *Thelymitra*. The genus *Genoplesium*, founded by Brown upon a drawing of *Bauer's*, we have included in *Prasophyllum*, with an amended character, *Bauer* appearing to us to have confounded the petals with the staminodia, though we must confess that it is difficult to understand how he came to do so; as however the different views of these organs, as represented by *Bauer*, are not consistent with one another, we are unavoidably compelled to suspect some error.—(Name from *πρασον*, a leek, and *φυλλον*, a leaf.)

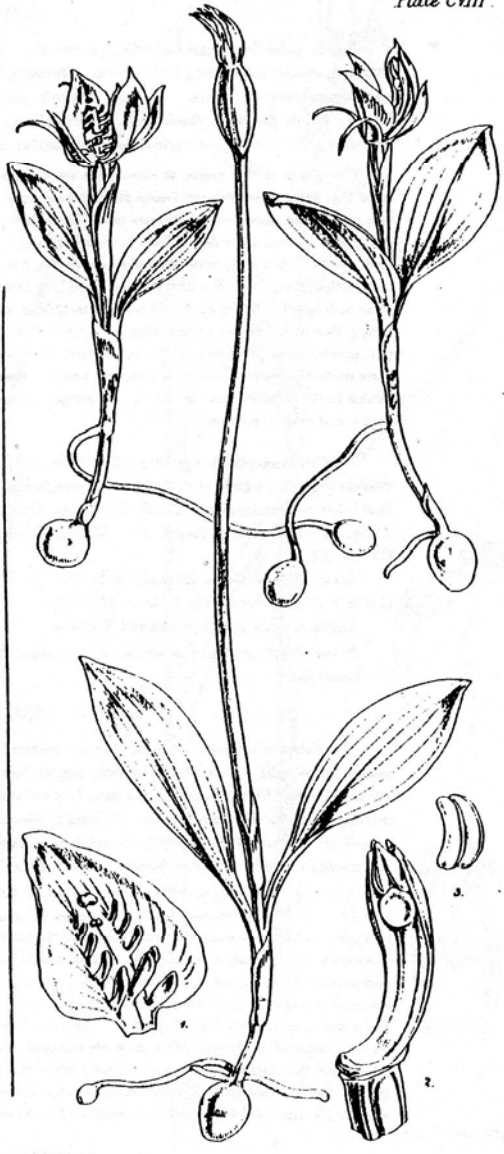
## CONSPECTUS SPECIERUM.

1. EUPRASOPHYLLUM.—*Sepala* et *petala* æqualia. *Labellum* breviter unguiculatum. *Columna* sepalis dorsali non adnata. *Staminodia* simplicia v. basi tantum lobulata. *Anthera* mutica. *Folium* plerumque scapo æqui-



W. Archer & W. Fisher del. W. H. R. Lith.

*A. Cryptostylis longifolia*, Br



Vincent, Brodia: Imp

*C. Chiloglottis Gunnii*, Lindl

longum.

A. *Labellum* ultra medium repente angustatum; margine non undulato.

1. *Sepala* lateralia sæpius connata. *Flores* virides, odorati. *Folium* elongatum . . . *P. alpinum*.

2. *Sepala* lateralia libera. *Flores* sæpius fuscæ, inodori; sepalis petalisque angustis.

*Folium* elongatum . . . . . *P. fuscum*, Br.

B. *Labellum* ultra medium sensim angustatum; marginibus undulatis.

a. *Sepala* lateralia plus minusve connata.

• *Ovarium* elongatum, cylindricum, bractea paulo longius.

3. *Staminodia* linearia, membranacea. *Folium* scapum æquans . . . . . *P. australe*.

4. *Staminodia* brevina. *Folium* breve . . . . . *P. flavum*.

•• *Ovarium* turgidum, pedicellatum; bractea pedicellum æquante.

5. *Sepala* lateralia basi non saccata. *Folium* breve . . . . . *P. breviclabre*.

6. *Sepala* lateralia basi saccata. *Folium* elongatum . . . . . *P. lutescens*.

β. *Sepala* lateralia libera.

7. *Sepala* lateralia apicem versus unidentata. *Labelli* lamella adnata, apice abrupte terminata . . . . . *P. truncatum*.

8. *Sepala* lateralia apice integra. *Labelli* lamina adnata, bicarinata, apice evanida . . . *P. patens*.

2. GENOPLESIMUM.—*Sepala* lateralia postico longiora. *Labellum* longius unguiculatum. *Columna* sepalo dorsali adnata. *Staminodia* bifida. *Anthera* rostrata. *Aphylla*, tuberibus apice vaginata, scapo superne 1-bracteato.

A. *Labelli* margo integra v. erosa, non fimbriata.

9. *Bractea* a spica remota. *Flores* horizontales. *Sepala* lateralia basi saccata. *Staminodia* subæqualiter bifida . . . . . *P. brachystachyum*.

10. *Bractea* basin spicæ attingens. *Flores* horizontales. *Sepala* lateralia basi non saccata. *Staminodia* subæqualiter bifida . . . . . *P. nudiscapum*.

11. *Bractea* a spica remota. *Flores* curvi, perianthio deflexo. *Sepala* lateralia basi non aut vix saccata. *Staminodia* subulata, falcato-incurva . . . . . *P. despectans*.

B. *Labelli* margo fimbriata.

12. *Flores* horizontales, pauci. *Sepala* lateralia basi non saccata. *Labelli* lamina adnata, simplex. *Staminodia* biloba, lobo inferiore fimbriato . . . . . *P. Archeri*.

13. *Flores* nuerosi, ascendentes v. suberecti. *Sepala* lateralia basi saccata. *Labelli* lamellæ adnatæ 2, parallæ. *Staminodia* biloba, lobo inferiore vix fimbriato . . . *P. nudum*.

A. EUPRASOPHYLLUM.—*Sepals* and petals nearly equal. *Labellum* with a short claw. *Anther* sessile, blunt.

‡ 1. *Lateral sepals* united throughout their length, or nearly so.

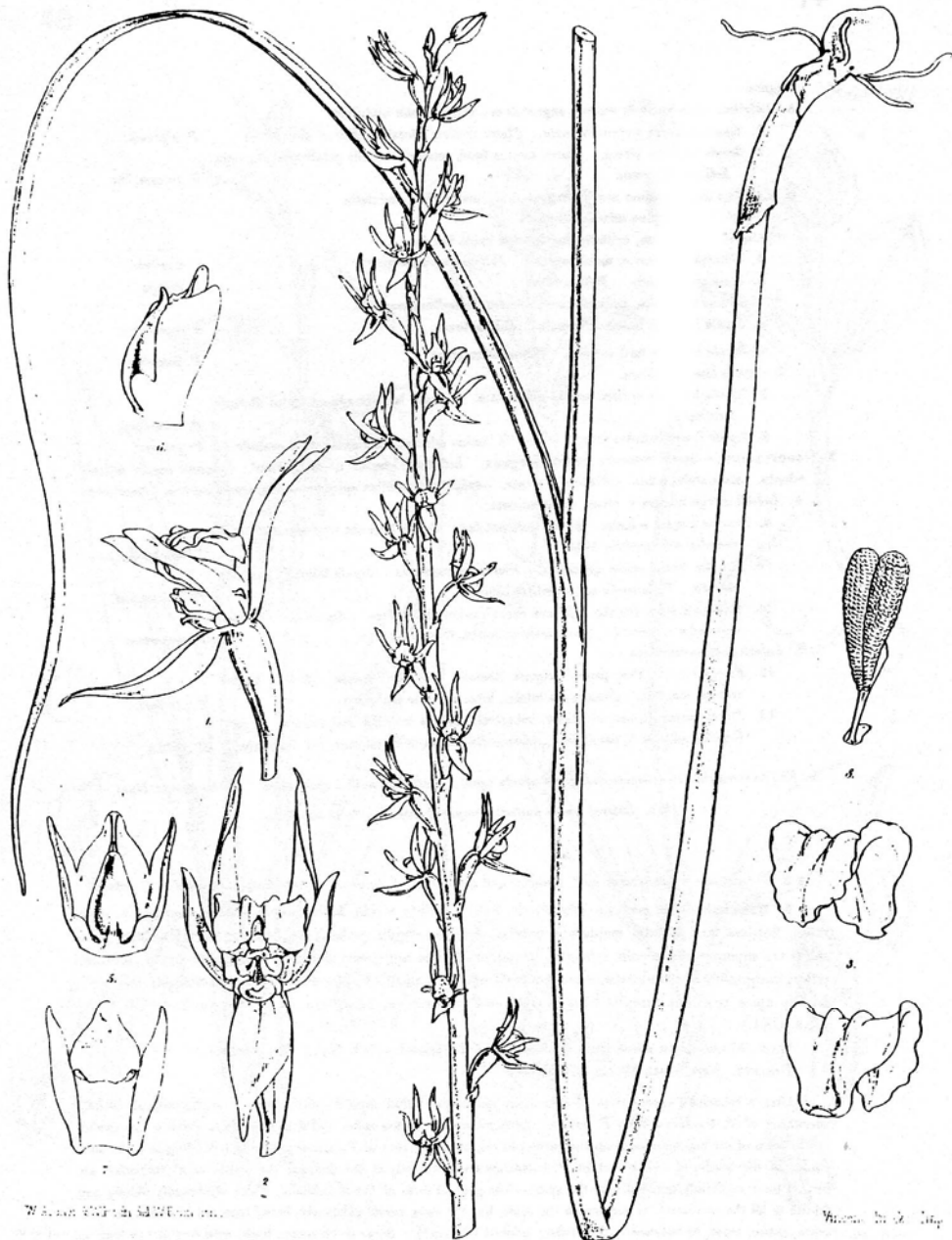
‡ 2. *Lateral sepals* free (except in *P. alpinum* and rostratum). *Labellum* not suddenly contracted at the apex.

5. **Prasophyllum patens** (Br. Prodr. 318); pallide viride, folio caulem elatum æquante v. superante, floribus laxè spicatis majusculis patulis, ovaris turgidis pedicellatis, bracteis parvis obtusis pedicellos vix superantibus, sepalis subacutis lateralibus liberis apice raro dentatis, labelli late ovato-lanceolati reflexi marginibus late undulatis, lamella adnata crassa bilamellata apice evanescente, staminodiis suberectis falcatis apice truncatis integris emarginatis.—*P. truncatum*, Lindl. l. c. 513. (Gunn, 352, 926, 927.) (TAB. CXI.)

HAB. Abundant in moist ground throughout the Island.—(Fl. Nov., Dec.) (v. v.)

DISTRIB. New South Wales and Victoria.

After a laborious examination of very many specimens, I find myself quite unable to distinguish all Gunn's specimens of *P. truncatum* from *P. patens*. Archer however, in his notes and drawings, distinguishes two species by the form of the adnate lamella on the surface of the labellum, that of *P. patens* gradually subsiding into the substance of the labellum, whilst that of *P. truncatum* ends abruptly at the flexure; the sepals of *P. truncatum* are further more uniformly notched near the apex.—The general form of the staminodia, which are broadly oblong and falcate in all the specimens, is very much the same, but the apex varies extremely, being truncate, rounded, or subacute, entire, erose, or notched.—*Root-tubers* bilobed (always?). *Scupe* 6–18 inches high, with one leaf as long as



W. A. ... ..

W. A. ... ..

*Protophyllum ...*



itself, or longer. *Spike* loose, appearing distichous in the dried specimens, many-flowered. *Flowers* often sweet-scented, but not constantly so, pale-whitish or greenish-yellow, pedicelled. *Bracts* very small, blunt, scarcely longer than the pedicels. *Ovaries* turgid. *Sepals* acute, the lateral free, never or seldom notched near the tip. *Petals* linear, blunt, sometimes more or less undulate. *Labellum* recurved, with a distinct, bilobed, rather fleshy lamella, which sinks gradually into the substance of the labellum at its termination; margins very undulate.—PLATE CXI. Fig. 1, side, and 2, front view of flower; 3, side, and 4, front view of labellum; 5, back, 6, side, and 7, front view of column; 8, pollen:—all magnified.

13. *Prasophyllum nudum* (Nob. in Fl. N. Zeal. i. 242); scapo aphylo gracili apicem versus 1-bracteato, spica multiflora, floribus suberectis breve pedicellatis minute bracteolatis atro-purpureis, sepalis lateralibus basi connatis subsaccatis dorsali ovato-acuminato longioribus, petalis ovato-lanceolatis acuminatis, labello oblongo-lanceolato unguiculato, lamina basi biariculata marginibus fimbriatis, lamellis adnatis 2 parallelis discretis, staminodiis bilobis lobo anteriore subulato subfimbriato posteriore obtuso latiore, anthera longiuscule rostrata. (TAB. CXIII. C.)

HAB. Collected by Gunn, but I do not know where.

DISTRIB. New Zealand.

Very variable in size, 3–10 inches high, always slender, with a leafless, one-bracteate scape, and rather long spikes of eleven to thirty ascending, minute flowers, smaller than in any of the preceding of this section. It is very nearly allied to *P. Archeri*, but differs in the two distinct, parallel lamellæ on the labellum, and the shorter, less fimbriated, anticlose lobe of the staminodia.—PLATE CXIII. C. Fig. 1, side, and 2, front views of flower; 3, labellum:—all magnified.

## IV

## Gen. III. CALOCHILUS, Br.

*Perianthium* ringens. *Sepala* patentia, libera, æqualia; lateralia labello supposita. *Petala* minora, erecta. *Labellum* anticum, sessile, simplex, liberum, acuminatum, disco marginibusque barbato. *Columna* tercia, carnea, cucullata, rostello acuto. *Anthera* stigmatè parallela, persistens, columnæ inclusa, mucronata. *Pollinia* 2, sulcata.—Herbæ glabræ, bulbis indivisis nudis; foliis paucis radicalibus canaliculatis, caulibus semi-vaginantibus; floribus paucis, raris, spicatis racemosive, majusculis, rufis albisve.

The few known plants of this genus are very beautiful, and all Australian; they are easily recognized by the red-brown (rarely yellowish or white) flowers, with an ovate-lanceolate labellum, covered with a copious, pendulous beard of delicate filaments.—*Root* an undivided bulb, above which are very thick, spreading, cylindrical rootlets; *stem* 12–18 inches high, with one or a very few narrow radical leaves, and some sheathing ones on the scape. *Flowers* few, large, racemose or spicate, with three nearly equal, lanceolate sepals, of which two are placed under the labellum, two inner petals similar to the sepals, and a long, pendulous, ciliate lip. *Column* short, hooded, enclosing an erect, acute anther.—The *C. campestris* has a four- to eight-flowered spike; the flowers about half an inch across; labellum longer than the sepals, terminating in a ligulate point of very variable length. I find such great differences in the length of the labellum and its ligulate apex, in the relative length of the bracts and ovaries, and in the size and colour of the flowers of the different forms of *Calochilus*, that I much doubt there being more than one species of the genus. (Name from *καλος*, beautiful, and *χελος*, a lip.)

1. *Calochilus campestris* (Br. Prodr. 320); caule 3–8-flo, sepalis lateralibus petalisque oblique ovatis acuminatis, labello sepalis subduplo longiore apice appendice ligulata brevi basi biglandulosa.—*Bot. Mag. t.* 3137. *C. campestris* et *C. herbaceus*, *Lindl. Gen. et Sp. Orchid.* 459. (*Gunn*, 919, 920.) (TAB. CVI. A.)

HAB. Not uncommon in moist ground, as also in poor, sandy soil: Rocky Cape and Woolnorth, *Gunn*; Port Sorrell, *Archer*; Huon River, *Oldfield*.—(Fl. Dec.)

DISTRIB. Tropical Australia, *Brown*; New South Wales, Victoria, and South Australia.

PLATE CVI. A. Fig. 1, labellum; 2, side, and 3, front view of column; 4, pollen:—all magnified.

## Gen. IV. SPIRANTHES, Rich.

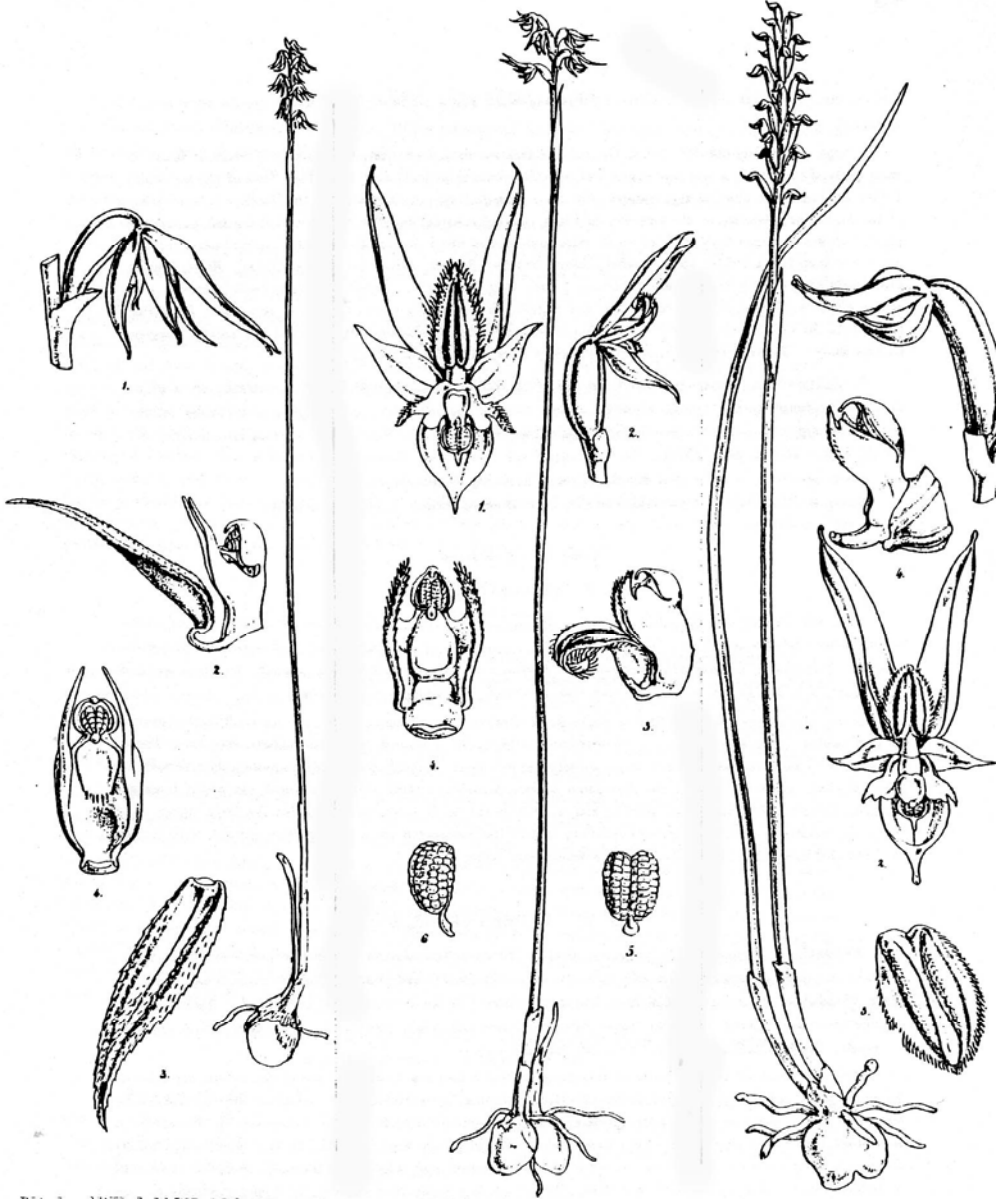
*Sepala* lateralia labello supposita, basi brevissime saccata; supremum cum petalis in galeam connovens. *Labellum* anticum, breviter unguiculatum, imberbe, columnam brevem amplectens. *Anthera* dorsalis, stigmatè parallela, rostello lamellato apice bifido incumbens. *Pollinia* 2, glandulæ communi affixa.—Herbæ



W. & A. W. W. W.

W. & A. W. W. W.

A. *Galochilus campestris*, Br. B. *Lycopanthus nigricans*, Br.



Warner & Hitchdel. Warb. 184.

Vincent. Bot. Soc. Trop.

*P. caspectans*, *Hb.*

*P. frascophyllum* Archer, *Hb.*

*P. nudum*, *Hb.*

*foliosa, radice e fibris crassis indivisis; foliis angustis; scapo vaginato; floribus in spicam saepe tortam dispositis.*

A large and widely-diffused genus, the only Tasmanian, or indeed Australian, species of which is found in many parts of the globe, a very rare instance of wide distribution in the Order. The New Zealand species, which I distinguished in the Flora of that country as *S. Nova-Zelandie*, appears, according to Dr. Lindley, to be a variety of the Australian, differing in the narrower labellum, but not constantly.—The *S. Australia* is a small, herbaceous plant, 4 inches to a span high, with a root of thick, unbranched fibres, several linear, radical leaves, and a vaginate scape, terminated by a twisted spike of small, reddish, crowded flowers. *Scape* and *spike* glandular. *Bracts* broadly ovate-acuminate, as long as the ovary. *Flowers*  $\frac{1}{2}$  inch long, horizontal. *Sepals* and *petals* ovate-lanceolate, subacute; dorsal sepal and petals forming together a galea; lateral sepals rather saccate at the base. *Lip* hardly longer than the sepals, white, shortly clawed, linear-oblong or obovate-oblong, with crumpled and crenate margins. *Column* short. *Anther* dorsal. (Name from *σπυρα*, a *spire*, and *αθος*, a *flower*.)

1. **Spiranthes Australis** (Lindl. in Bot. Reg. 823); foliis anguste lineari-lanceolatis, spica glanduloso-pubescente tortili, labello oblongo obtuso marginibus crispatis basi biligulato, columnæ lobulis lateralibus stigmatè longioribus.—*S. Nova-Zelandie*, *Nob.* in *Fl. N. Zeal.* i. 243. *Neottia Australis*, *Br. Prodr.* 319. (*Gunn*, 402, 754.)

HAB. Moist places: Circular Head, *Gunn*; Cheshunt, *Archer*.—(Fl. Nov.)

DISTRIB. New South Wales and Victoria, New Zealand, China, India, and Siberia.

#### Tribe II. ARETHUSEÆ.

##### Gen. V. CORYSANTHES, *Br.*

*Perianthium* ringens. *Sepalum* supremum maximum, galeatum; lateralibus basi connatis, una cum petalis angustissimis labello occultata. *Labellum* magnum, cucullatum v. tubulosum. *Columna* brevis, solida. *Anthera* 1-locularis, semibivalvis, persistens. *Pollinia* 4.—*Herbæ* perpusilla, glabra; folio unico rotundato, integro v. lobato; flore solitario, maximo, subsessili, luride rufo v. purpureo.

A very singular genus, consisting of about six Australian and one Javan plant; all are small herbs, growing in very shaded, damp woods, and have slender roots, with one or two small, pedicelled tubers, very short stems, a rounded, very membranous leaf, and large, solitary, dingy rufous-coloured, sessile flower, quite unlike that of any other Orchideous plant; that of the Tasmanian species resembles a snail.—*Sepals* unequal, the upper large and hooded, the lateral very small and narrow, and, as well as the small petals, hidden under the large upper sepal. *Lip* large, tubular or saccate, sometimes spurred; that of the Tasmanian species is spurless, hooded, with toothed or serrated margins. (Name from *κόρυς*, a *helmet*, and *αθος*, a *flower*.)

##### Gen. VI. LYPERANTHUS, *Br.*

*Perianthium* carnosulum, papillosum, ringens, extus eglandulosum. *Sepalum* posticum fornicatum; lateralibus et petala angusta, planiuscula, subæqualia. *Labellum* breve, semicucullatum, ascendens, recurvum, disco glanduloso v. costato. *Columna* linearis, solida. *Anthera* bilocularis, terminalis. *Pollinia* 4.—*Herbæ* terrestres, glabra, radicibus crasse fibrivis tubercem solitarium gerentibus; caulibus basi foliato, superne inato; floribus racemosis, fuscis v. luride atro-purpureis.

There are about six known species of this genus, of which four are Australian, and of the others, one inhabits New Caledonia, and the other Lord Auckland's Group, south of New Zealand. *L. nigricans*, the only Tasmanian species, is rather common in Australia, extending from Sydney to Swan River, but is very rare in Tasmania; it is a stout, herbaceous plant, 4-7 inches high, with dark, red-purple flowers. *Root* of very stout, often woolly fibres, springing from the base of the stem, of which one, stouter and longer than the rest, terminates in an oval, undivided tuber. *Leaves* very thick and fleshy, the lowest largest, ovate or circular, the upper gradually passing into sheathing bracts, which loosely clothe the scapes. *Flowers* three to five, racemose, about 1 inch long, almost concealed in the large, elliptical, concave bracts. *Upper sepals* galeate, lanceolate, acute; *lateral sepals* about equal in length, linear, curving downwards. *Petals* ascending. *Lip* blunt, with a revolute apex, glandular disc, and crisped margins. (Name from *λύπηρας*, *morsifal*, and *αθος*, a *flower*; in allusion to the aspect of the flowers.)

## Gen. VIII. CALEANA, Br.

*Perianthium* subbilabiatum. *Sepala* et *petala* subaequalia, linearia. *Labellum* posticum, unguiculatum, limbo peltato cavo, foramine exteriori. *Columna* maxima, petaloidea, concava. *Anthera* terminalis, persistens, loculis approximatis. *Pollinia* 4.—Herbæ graciles, glabrae, 1- v. pauciflorae; radicibus fibrosis, tuberiferis; folio radicali solitario, basi vaginato; floribus fusco-viridibus, labello columnaque rufis; labello mobili, reflexo, instante pluvio v. irritatione inflexo, columnae incumbente.

The species of this genus, of which only three are known, are remarkable for the irritability of the lip; this is posticous, has a long, narrow pedicel, and stands erect, as it were, over the flower, but when the plant is shaken, or rain comes on, it suddenly shuts down, like a lid, on the flower, and its lamina becomes closely applied to the large petaloid column. A Swan River species is said thus to catch insects, whose struggles appear to disengage the pollen from the anther, and apply it to the stigma.—Slender, herbaceous plants, with a solitary, narrow, radical leaf, and tall scape, bearing one or very few, rather large, deep red-brown flowers. The Tasmanian *C. major* is a spurn to 8 inches tall, with a leaf varying from narrow-linear to broadly lanceolate, a scape with one small, sheathing bract, and about two flowers,  $\frac{1}{2}$ – $1\frac{1}{2}$  inch long. Flowers pedicelled, with a small bract at the base of the pedicel, reversed, the labellet being above. *Sepals* three, narrow-linear, one hanging down behind the column, and the two lateral pointing backwards, nearly horizontally, notched at the margin. *Petals* about as long as the column, linear, placed against its sides, pointing downwards and forwards. *Labellum* with a long, slender peduncle, the lamina produced into a narrow point at the apex, and at the base into a subulate appendage. *Column* much larger than any other part of the flower, broadly dilated, petaloid, dark red-brown, with a terminal, greenish anther. (Named in honour of O. Caley, a diligent explorer of New South Wales botany.)

## Gen. IX. PTEROSTYLIS, Br.

*Perianthium* ringens. *Sepalum* posticum cum petalis in galeam connatis v. conniventibus; lateralia connata, deflexa v. erecta. *Labellum* unguiculatum, inclusum v. exclusum et dependens, limbo angusto basi appendiculato, ungue sepalis adnato. *Columna* elongata, arcuata, semiteres, apice auriculis petaloideis alata. *Anthera* terminalis, persistens, loculis approximatis. *Pollinia* 4, compressa.—Herbæ pleræque membranaceae, foliosae v. aphyllae; radicibus e caudicibus elongatis, apice tuberiferis; caulibus v. scapis 1- paucis v. plurifloris; floribus parvis v. magnis, pallide viridibus, labello saepe irritabili.

A large and very peculiar and well-marked genus, common in extratropical Australia and New Zealand, but not hitherto detected elsewhere. About 35 species are known to me, of which 28 are Australian, and half of the latter are Tasmanian; they present very different forms, but all agree in being pale green herbaceous plants, with underground tubers terminating long caulices.—Leaves generally rosulate and radical, more rarely linear and alternate on the stem, rarely none, or reduced to sheathing scales; in some species the leaves appear only after the flowers; in others again they are borne on separate stems, springing from the base of the flowering scape. Flowers solitary, or numerous and spiked, large or small. *Upper sepal* and *petals* together forming a very convex upper lip or galea; *lower sepals* connate, ascending and closing the flower, or hanging downwards. *Labellum* often irritable, usually small, linear, clawed, the limb narrow, with an appendage at the base, in some species fringed with long hairs. *Column* slender, winged near the apex. (Name from πτερον, a wing, and στυλος, a column.)

§ 1. *Radical leaves spreading. Scape one-flowered, with one or more sheathing bracts, or leafy. Lower lip of perianth ascending. Labellum glabrous.*

2. *Pterostylis nutans* (Br. Prodr. 327); foliis radicalibus stellatis petiolatis ovatis oblongisve subcutis, scapo gracili 1-2-bracteato, flore solitario horizontali v. nutante, labio inferiore galeam apice decurrantem æquante, labelli inclusi limbo piloso v. glabro apice attenuato truncato, appendice bifida penicillata.—*Bot. Mag. t.* 3085; *Lindl. l. c.* 391. (*Gunn*, 604.)

ΠΛΒ. Common in shaded places, in a poor soil.—(Pl. Sept.—Nov.) (v. v.)

DISTRIB. New South Wales.

Similar in general characters to *P. curta*, but readily distinguished by the horizontal or nodding flowers, by the lips of the perianth being equal in length, and by the apex of the galea being suddenly turned downwards.—*Wings of column* produced upwards into slender, filiform appendages, broadly auricled below, and dilated.

4. *Pterostylis nana* (Br. Prodr. 327); foliis radicalibus stellatis longe petiolatis ovatis obtusis acuminatisve, scapo puberulo 2-bracteato, bracteis distantibus subfoliaceis, flore erecto, labii inferioris laciniis filiformibus galeam acuminatam subaequantibus, labelli lanceolati appendice bifida subpenicillata.—*Lindl. l. c.* 391. (*Gunn, 902.*) (TAB. CXIV. B.)

HAB. Dry soil; not uncommon in several parts of the Colony: Woolnorth, Circular Head, *Gunn*; Bagdad, *Miss Forster*.—(Fl. Oct.) (v. v.)

DISTRIB. Victoria, *Robertson*.

Very similar to *P. pedunculata*, but much smaller, with petiolate, ovate, acute, or even acuminate leaves; smaller, less foliaceous, lanceolate bracts; a pubescent scape, and smaller flower.—*Leaves* rather numerous,  $\frac{1}{2}$ –1 inch long, including the long petiole. *Flower* erect,  $\frac{1}{2}$ –1 inch long. *Wings of column* produced upwards and downwards into subulate points.—PLATE CXIV. B. Fig. 1, labellum; 2, side, and 3, front view of column:—all magnified.

5. *Pterostylis furcata* (Lindl. Gen. et Sp. Orchid. 390); foliis radicalibus stellatis petiolatis lanceolatis ellipticisve acutis (interdum dissitis), bracteis 2–3 foliaceis laxe vaginantibus, flore erecto, perianthio glaberrimo, labii inferioris laciniis anguste caudatis galeam vix incurvam acuminatam superantibus, labello lineari, appendice bifida penicillata. (*Gunn, 602.*)

HAB. Shaded, wet places: near Launceston and Deloraine, *Gunn*; Chudleigh and Cheshunt, *Archer*.—(Fl. Oct.)

Closely allied to *P. pedunculata*, but easily distinguished by the narrower, more shortly petioled leaves, the shorter laciniæ of the lower lip, and the scarcely incurved galea. The smaller bracts and laciniæ of the lower lip being produced beyond the galea, distinguish it from *P. cucullata*.—*Wing of the column* produced upwards into a very short, blunt point, and downwards into a blunt, long auricle.

§ 2. *Radical leaves spreading. Scape one- or many-flowered. Lower lip of perianth deflexed. Labellum fringed with long hairs.*

9. *Pterostylis squamata* (Br. Prodr. 327); foliis radicalibus stellatis imbricatis suberectis lanceolatis acuminatis, caulinis lanceolatis, flore erecto, galea oblongo-lanceolata apice oblique truncata acuminata, labio inferiore deflexo bipartito laciniis linearibus, labelli lamina subulata pilis flavis crinita apice glandula incrassata clavata glabra, appendice apice penicillata.—*Flor. N. Zeal. i.* 249. *P. squamata* et *P. barbata*, *Lindl. l. c.* 388. (*Gunn, 603.*) (TAB. CXVI. A.)

HAB. Common in sandy soil: near Hobartou, Circular Head, Georgetown, etc., *Gunn, Archer*.—(Fl. Nov.)

DISTRIB. Victoria, Swan River, New Zealand.

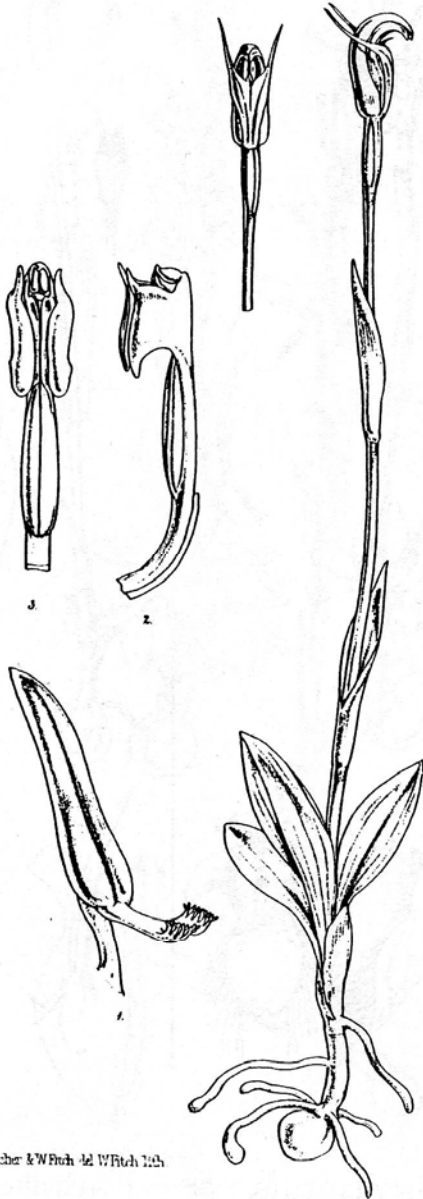
A very remarkable species, 5–8 inches high, conspicuous from the beautiful labellum being fringed with yellow hairs, and terminated by a purple, polished, capitate gland. *Archer* remarks that the labellum is irritable, as in most of the genus.—*Wing of the column* produced upwards into a long, erect, subulate point, and downwards to a long, falcate auricle.—PLATE CXVI. A. Fig. 1, flower; 2, side view of labellum and column; 3, front view of labellum; 4, hairs of the same; 5, front view of column:—all but fig. 1 magnified.

10. *Pterostylis mutica* (Br. Prodr. 328); foliis radicalibus confertis stellatis breve petiolatis ovatis, scapo bracteato multifloro, spica subspirali, floribus suberectis, perianthio inclinato v. horizontali, galea brevi lata obtusa, labio inferiore deflexo ovato obtuso indiviso v. breviter bifido, labello oblongo obtuso, appendice elongata apice lobata v. obtusa.—*Lindl. l. c.* 390. (*Gunn, 605, 900, 901.*) (TAB. CXVII. B.)

HAB. Common in rich pastures, as well as in light sandy soil.—(Fl. Oct., Nov.) (v. v.)

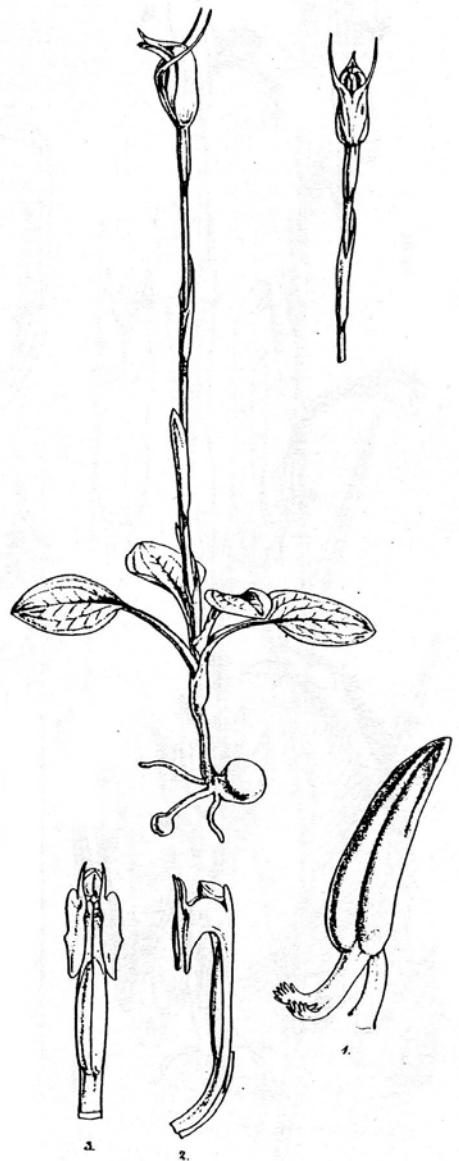
DISTRIB. New South Wales and Victoria.

A very variable and abundant species, from 3 to 10 inches high, robust or slender, few- or many-flowered, the flowers small, densely or loosely spiked, the spike straight or somewhat twisted.—*Leaves* all radical, numerous. *Scape* bracteate. *Flowers* suberect,  $\frac{1}{2}$ – $\frac{1}{2}$  inch long. *Perianth* inclined or horizontal. *Galea* short, broad, blunt, nearly straight, or incurved at the apex. *Lower lip* bent down, ovate, entire and blunt, or bifid at the apex. *Labellum* short, broad, with a long, stout, incurved appendix, that is simple or thickened at the apex, and there entire or lobed. *Wing of column* slightly ciliated at the lower margin, scarcely auricled.—PLATE CXVII. A. Fig. 1, side, and 2, front view of lower lip and labellum; 3, side, and 4, front view of column:—all magnified.



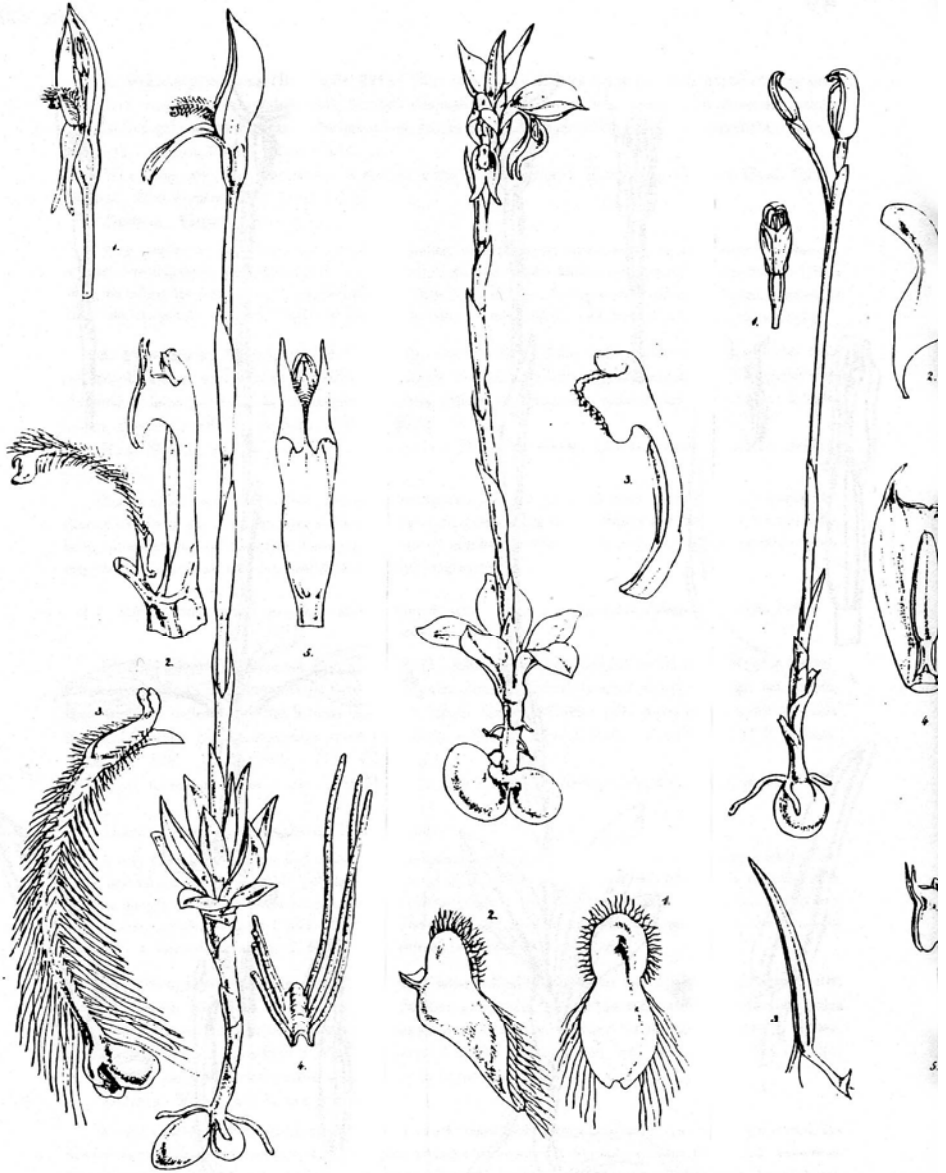
W. Archer & W. Pritch del. W. Pritch lith.

A. *Pterostylis pedunculata*, Br



Vincent Brooks Imp.

B. *P. nana*, Br



W. Anther & W. Frick del. W. B. G. lith.

Vincent. Br.

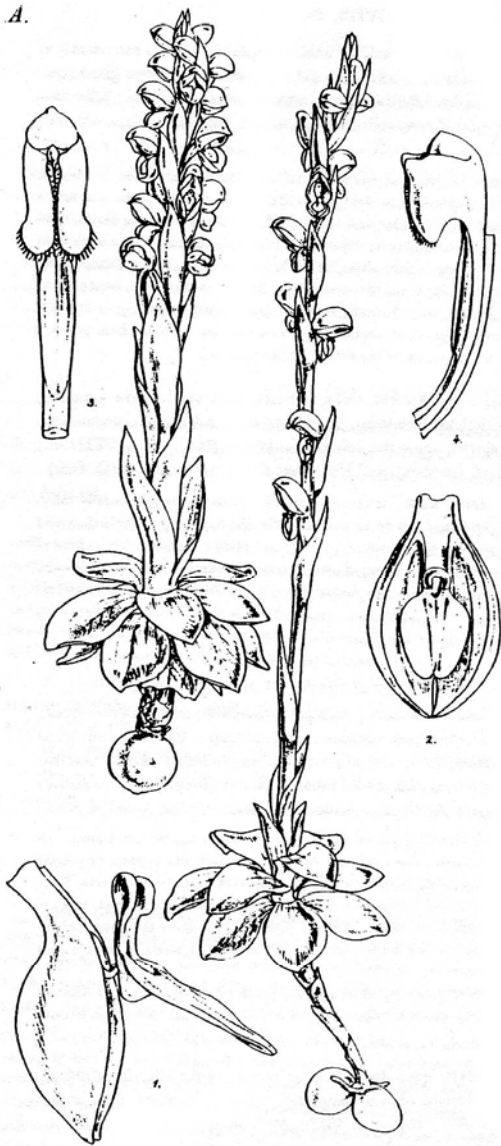
*P. squarrosa*, Br.

*Pterostylis rufa* Br.

*P. aphylla*, Lindl.



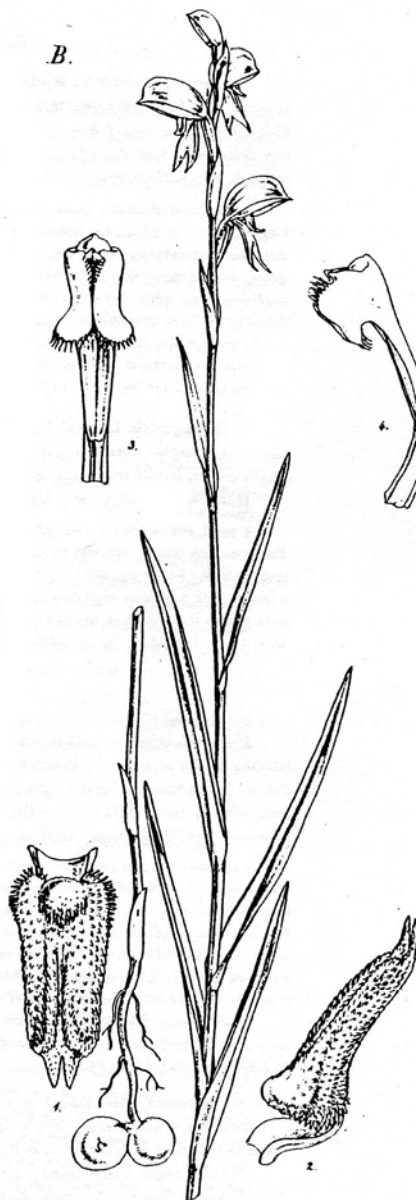
A.



W. Sch. & W. Fitch del. W. Fitch. lith.

*Pterostylis muuca*, Br.

B.



Vincent Brooks Imp.

*Pterostylis longifolia*, Br.

## Gen. X. CHILOGLOTTIS, Br.

*Perianthium* bilabiatum; sepalo dorsali fornicato, lateralibus labello suppositis. *Petalis* ascendentia v. reflexa. *Labellum* unguiculatum, basi appendiculata; appendice lingulata v. columnari; disco glanduloso. *Columna* elongata, apice bifida. *Anthera* terminalis. *Pollinia* 4.—Herbæ terrestres, caudiculis radicalibus basi tuberiferis; foliis 2, radicalibus; scapo infra florem unibracteato, unifloro; floribus luridis, suberectis; pedicello post anthesin elongato.

A very peculiar-looking genus, closely allied to *Cyrtostylis*, but of a much more robust habit, and two-leaved. Only three species are known, one confined to Tasmania, a second found in the same island and Australia, and a third hitherto observed only in the Auckland and Campbell Islands, south of New Zealand.—*Root* a simple, elongated, descending caudicle, terminating in a round naked tuber, and giving off from near the base of the stem other caudicles, whose tubers bear stems in the following year. *Leaves* two, at the base of the stem, with a sheath round their base. *Scape* rather stout, erect, with one sheathing bract near the middle. *Flower* rather large, erect; *dorsal sepal* arched, acute; *lateral* placed under the labellum, curved downwards. *Petals* narrow, ascending or deflexed. *Labellum* clawed, rather fleshy, simple, ovate, with large, erect, capitate glands on the disc. (Name from *χελος*, a lip, and *γλωττα*, the tongue; from the form of the appendix of the first-described species.)

2. *Chiloglottis Gunnii* (Lindl. Gen. et Sp. Orchid. 387); robusta, foliis ovatis breve petiolatis, scapo brevi, sepalo dorsali unguiculato spatulato acuminato, lateralibus ovato-subulatis ascendentibus, petalis erectis, labello trulliformi, glandulis sparsis, appendice columnari. (Gunn, 913.) (TAB. CVIII. B.)

HAB. Shaded banks, etc.: Circular Head, Cheshunt, and Hobarton, Gunn, Archer, etc.—(Fl. Oct.)

A small, robust species, 2–4 inches high. *Leaves* sessile, or shortly petioled. *Flowering scape* generally thick. *Flower* an inch across, with very much broader sepals and petals than *C. diphylla*, the upper sepal unguiculate and spatulate, the lateral not united at the base, ascending and recurved. *Petals* ascending. *Labellum* of the form of a trowel, with numerous stipitate glands, which often are so arranged as to resemble an ant, as in *C. diphylla*.—In both species the pedicel of the flower elongates remarkably after flowering.—PLATE CVIII. B. Fig. 1, labellum; 2, column; 3, pollen:—all magnified.

## Gen. XI. MICROTIS, Br.

*Perianthium* herbaceum, ringens. *Sepalum* dorsale cum petalis parvis linearibus in galeam connovens; lateralia labello supposita. *Labellum* dissimile, oblongum, obtusum, integerrimum v. lobatum, callis glandulise instructum. *Columna* nana, infundibuliformis, utrinque auricula membranacea aucta. *Anthera* terminalis, mutica. *Pollinia* 4.—Herbæ terrestres, glabræ; radicibus e tuberis oblongis nudis indivisis; folio caulino solitario, tereti, fistuloso, basi vaginante; floribus herbaceis, parvis, viridibus, dense spicatis.

A common genus in temperate Australia and New Zealand, of which about a dozen species are known. A species is found in New Caledonia, and another in Java. These are very variable in stature, but uniform in general characters, forming rather stout, green herbs, with small, green, densely spiked flowers, and a single, terete, fistulose leaf.—*Roots* of undivided oblong tubers. *Perianth* herbaceous, green, of one dorsal, rather large, concave sepal, parallel to and on each side of which is a small linear sepal. *Lateral sepals* placed under the green, oblong labellum, which is furnished with granulated, callous bodies on its surface. *Column* small, terete, with expanded margins. (Name from *μικρος*, small, and *ovis*, an ear.)

I have characterized three species of this genus, following Brown's and Lindley's descriptions, and Archer's notes and drawings, but I am unable to distinguish the dried specimens, and I suspect that many intermediate and aberrant forms will be found.

4. *Microtis parviflora* (Br. Prodr. 321); spica densa, floribus parvis, sepalis lateralibus oblongis revolutis petalisque obtusis, labello lineari-oblongo obtuso marginibus planiusculis nudis, disci dimidio superiore ecalloso.—Lindl. Gen. et Sp. Orch. 395; Bot. Mag. 3377; *Encl. Ic. Gen.* 1588.

HAB. Circular Head, Gunn; dry ground near Cheshunt, Archer.—(Fl. Dec.)

DISTRIB. Tropical Australia, New South Wales, and Victoria.

Smaller than any of the foregoing species, with smaller flowers, shorter ovaries, and a short, oblong, blunt, nearly plane labellum, its upper half thickened, but hardly callous.

## Gen. XII. ACIANTHUS, Br.

*Sepala* patentia, acuminata v. aristata; lateralia labello supposita. *Petala* minor, acuminata. *Label- lum* liberum, integrum, basi bicallosum, disco inappendiculato. *Columna* semiteres, clavata, inauriculata. *Anthera* terminalis, persistens, 2-locularis, recumbens. *Pollinia* 8, v. 4 bipartita.—Herbæ parve, teneræ, membranaceæ; tuberibus globosis, indivisis, caudicem terminantibus, novellis pollicellatis; folio solitario, subsessili, late coriolato, reticulato-venoso; floribus paucis, racemosis.

A very small genus, of delicate, shade-loving, inconspicuous plants, found in temperate Australia and New Zealand.—Roots of prostrate caudices, ending in small, round tubers. *Stems* slender and succulent, with one broadly-cordate, sessile, membranous, reticulated leaf. *Flowers* few, red-brown, racemose. *Sepals* and *petals* slender, acuminate, or terminated in a subulate point. *Labellum* projecting, undivided, with a naked disc, and two calli at its base. *Column* long, slender, not dilated into auricles. *Anther* deciduous, placed rather behind the apex of the column (as in *Nectliceæ*). (Name from *ακνς*, a needle, and *αρθος*, a flower; in allusion to the pointed perianth.)

## Gen. XIII. CYRTOSTYLIS, Br.

*Sepala* patentia, linearia (non aristata), dorsali erecto, lateribus labello suppositis, æquilongis. *Petala* demissa. *Labellum* porrectum, planum, obtusum, indivisum, basi bicallosa. *Columna* gracilis, subgeniculata, versus apicem dilatata. *Anthera* bilocularis, terminalis, persistens, teres. *Pollinia* 4.—Herbæ habitus etc. *Acianthi*.

Very closely allied to *Acianthus*. Only one Australian species is known, and several New Zealand ones. *C. reniformis* is a delicate herb, 4-8 inches high, with the general habit and appearance of *Acianthus*.—*Leaf* oblong-cordate, or almost orbicular-cordate. *Flowers* three to six, racemose, pale purplish-brown, very membranous, about  $\frac{1}{2}$  inch long. *Sepals* and *petals* nearly equal in length, narrow-linear, not aristate; dorsal sepal erect, the lateral and petals pendent, and pointing rather forwards. *Labellum* narrow-linear, oblong, with two deeper-coloured, raised mesial ridges. *Column* slender, inflexed, with membranous wings towards the apex. (Name from *κυρτος*, short, and *στυλος*, a column; in allusion to the short column.)

1. *Cyrtostylis reniformis* (Br. Prodr. 322); folio oblongo v. orbiculari-cordato, perianthii foliolis anguste linearibus acutis, labello lineari-oblongo medio obscure bicarinato.—Lindl. l.c. 398. (Gunn, 615.) (TAB. CXIX. C.)

HAB. Common in damp shaded woods and banks.—(Fl. Sept.) (v. v.)

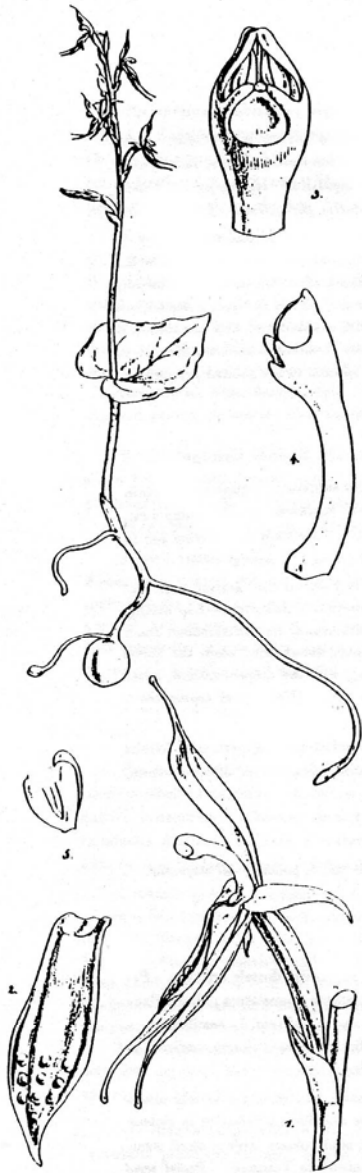
DISTRIB. New South Wales, Victoria, and Swan River.

PLATE CXIX. C. Fig. 1, column and labellum; 2, labellum; 3, column; 4 and 5, pollen:—all magnified.

## Gen. XV. CALADENIA, Br.

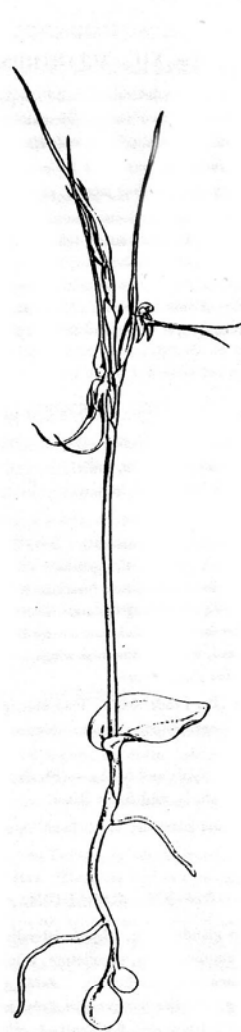
*Perianthium* bilabiatum, extus glandulosum. *Sepala* lateralia labello supposita, dorsale erectum. *Petala* erecta v. patentia. *Labellum* unguiculatum, cucullatum, trilobum v. abrupte angustatum; disco glandulis seriatis cristato. *Columna* membranaceo-dilatata. *Anthera* terminalis. *Pollinia* 4, semibiloba.—Herbæ pubescentes, pilosa v. villosa; caudice subterraneo, tuberibus terminato; folio solitario, radicali v. caulino, basi vaginato; scapo medio 1-bracteato; floribus 1-4, colore variis.

A large extratropical Australian genus, of which about 40 species are known, and there are several others natives of New Zealand.—Glandular, sometimes villous, pubescent herbs, with few root-fibres terminating in globose tubers, and one sessile, sheathing, radical leaf. *Flowers* glandular, solitary or few, of all colours, large or small, sometimes with very long, slender sepals and petals, and commonly called Butterfly-plants in Tasmania. *Dorsal sepal* generally concave, pointing forwards; lateral placed beneath the labellum. *Petals* erect or spreading. *Labellum* clawed, cucullate, with incurved, membranous, often fimbriate margins, entire or three-lobed, generally much contracted beyond the middle, its disc with two or more rows of pedicelled glands. *Column* with membranous margins. (Name from *καλος*, beautiful, and *αδην*, a gland; in allusion to the glandular labellum.)

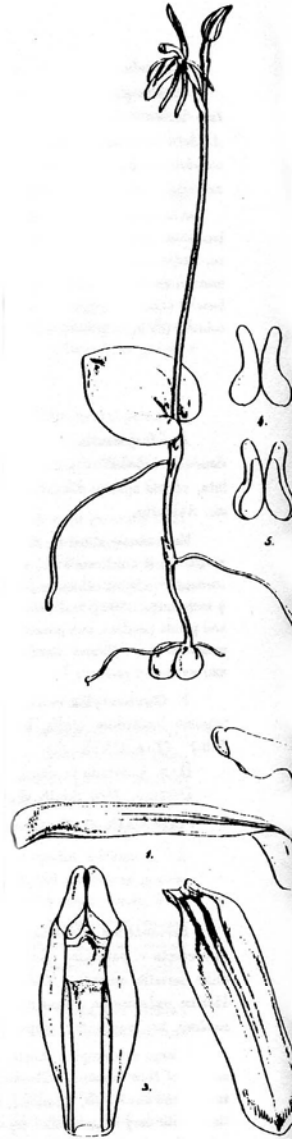


Wärche & W. Fiedl. del. W. Fiedl. lith.

*Acanthus exsertus*, Br.



*Acaudatus*, Br.



Vincent Brooks I.

*Gyrtostylis reniformis*

10. *Caladenia carnea* (Br. Prodr. 324); pilosula, folio lineari, scapo 1- (rarius 2-)floro, sepalis petalisque roseis subaequalibus, sepalo dorsali erecto v. recurvo columnam roseo-vittatam non velante, labelli vittati 3-lobi disco glandulis 2-seriatis ornato, lobis lateralibus rotundatis integerrimis intermedio brevi revoluto longitudinaliter fimbriato disco nudo.—*Lindl. Gen. et Sp. Orchid.* 417; *Endl. Icon.* t. 1594. (*Gunn*, 606, 912.) (TAB. CXXIV. A.)

HAB. Abundant throughout the Island, in grassy places and open forest land.—(Fl. Oct., Nov.) (v. v.)

DISTRIB. South-eastern Australia, from the tropics to South Australia.

A very common, slender, generally one-flowered species, 4-8 inches high, with pilose scape and long-linear leaf.—*Flowers* pink, about  $\frac{1}{2}$ – $\frac{3}{4}$  inch across. *Sepals* and *petals* nearly equal, linear-lanceolate, acute; dorsal sepal erect, not concave, or covering the column, as in all the following species. *Labellum* three-lobed, transversely banded with pink (as is the column); lateral lobes rounded, entire or toothed; disc with two series of yellow, capitate glands; middle lobe small, yellow, revolute, fimbriate along the edges, its disc naked.—PLATE CXXIV. A. Fig. 1, column and labellum; 2 and 3, views of labellum; 4, column; 5, glands of labellum; 6, pollen:—all magnified.

12. *Caladenia alata* (Br. Prodr. 324); pubescens, folio lineari, scapo elongato 3-5-floro, perianthii foliolis acuminatis, sepalo dorsali fornicato columnam velante roseo-vittato, labelli trilobi vittati disco glandulis 2- v. sub-4-seriatis, lobis lateralibus rotundatis integerrimis intermedio flavo plus minusve fimbriato.—*Lindl. l. c.* 418; *Smith, Ex. Bot.* 104. (*Gunn*, 755.) (TAB. CXXV. A.)

HAB. Probably a common species: sandy soil near Hobarton, *Gunn*; open forest land, Cheshunt, *Archer*.—(Fl. Nov.) (v. v.)

DISTRIB. New South Wales and Victoria.

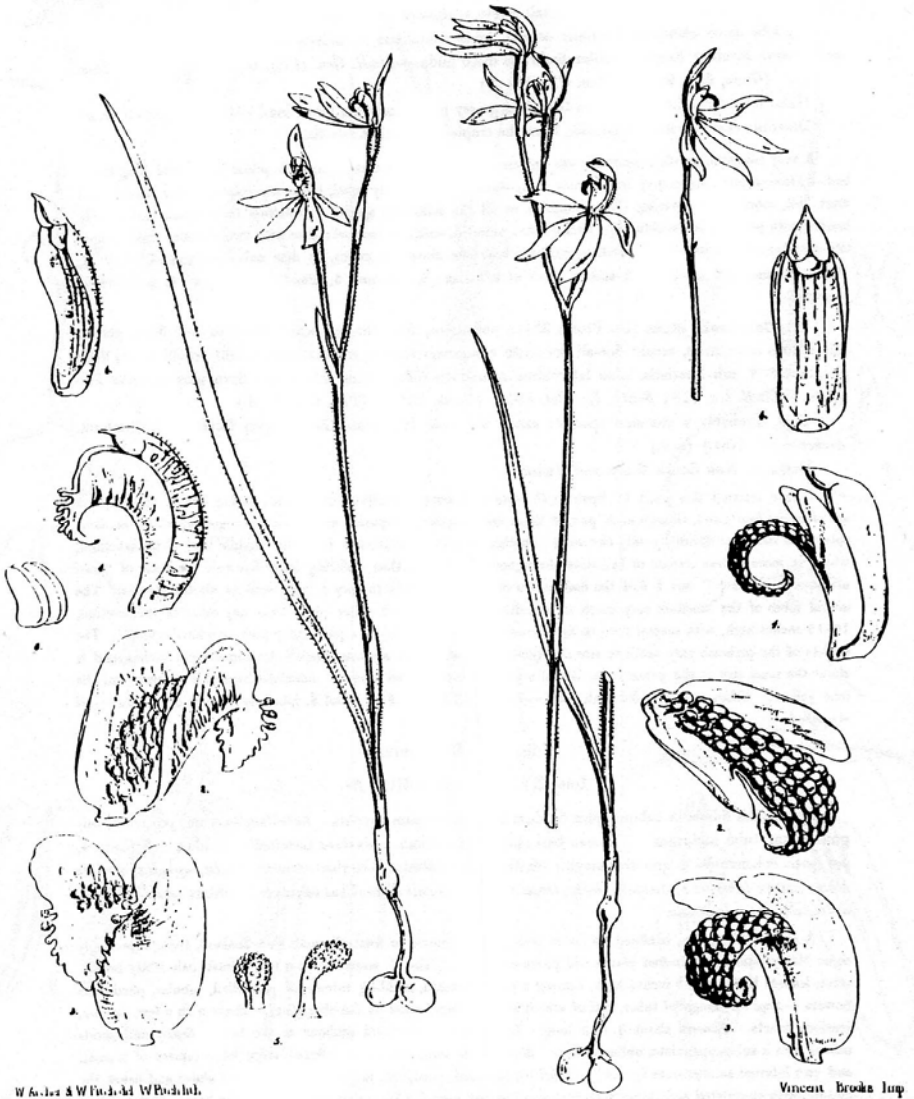
I have referred this plant to Brown's *C. alata* with some hesitation; the glands on the disc of the labellum are often in four rows, though each pair of these are irregularly disposed, and often run together, whilst in some specimens there are decidedly only two rows; another important difference is in the middle lobe of the labellum, which is more or less crenate or fimbriate throughout its length, thus differing from Brown's character of "basi utrinque unidentato;" but I find the fimbriation of the middle lobe to vary a good deal in all the species. The lateral lobes of the labellum vary much in breadth.—This is a much taller plant than any other of this section, 10-18 inches high, with several (two to five) flowers (rarely one only) of a pale, dirty pink or whitish colour. The leaflets of the perianth vary much in size and relative shape, but all are acuminate; the dorsal sepal arches, and is about the same size as the petals; the lateral sepals are broader and longer. *Labellum* banded with pink; middle lobe yellow. *Column* also banded with pink.—PLATE CXXV. A. Fig. 1 and 2, labellum; 3 and 4, column:—all magnified.

### Tribe III. GASTRODIEÆ.

#### Gen. XVII. GASTRODIA, Br.

*Perianthii* folioli in tubum apice 5-fidum basi ventricosum connata. *Labellum* parvum, posticum, unguiculatum, tubo inclusum. *Columna* basi antice stigmatifera. *Anthera* terminalis, decidua. *Pollinia* 4, per paria coherentia, e granulis magnis elasticis coherentibus.—Herb: *carnea, erecta, aphylla, sordide albæ*; radice *tuberosa v. elongata, torta, tereti*; scapo *squamis distantibus vaginato*; floribus *racemosis, pendulis, albis v. ochroleucis*.

A remarkable genus, confined, as far as is at present known, to Australia and New Zealand, though probably some Malay Island and Indian plants will prove congeners. The *G. sesamoides* is a tall, robust, pale white-brown, erect, leafless herb, 10-24 inches high, bearing a many-flowered, nodding raceme of pedicelled, tubular, pendulous flowers.—*Root* an elongated tuber, full of starch and mucilage, eaten by the aborigines. *Scape* with a few, remote, scarios bracts. *Flowers* about  $\frac{1}{2}$  inch long. *Ovary* small. *Perianth* gibbous at the base. *Sepals* and *petals* united into a subcampanulate, oblique tube. *Mouth* with three somewhat reflexed large lobes (apices of sepals), and two internal smaller ones (petals). *Labellum* included, posticous, unguiculate, contracted above and below the middle, with crenulated and rather verrucose margins and mesial ridge; *claw* concave from the base. *Column* elongated, hollow on the anterior face, scarcely winged. *Anth* short, terminal. *Pollen-masses* four, united in pairs. *Stigma* a viscid depression at the base of the column; from its base a canal leads to the cavity of the ovary. (Name from γαστήρ, a stomach; in allusion to the form of the flower.)

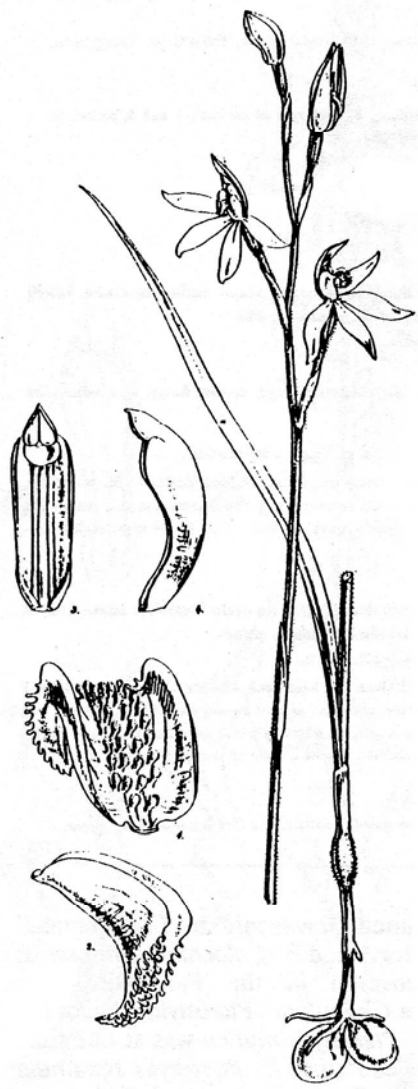


W. G. L. & W. H. B. del. W. Bodley.

Vincent Brooks Imp.

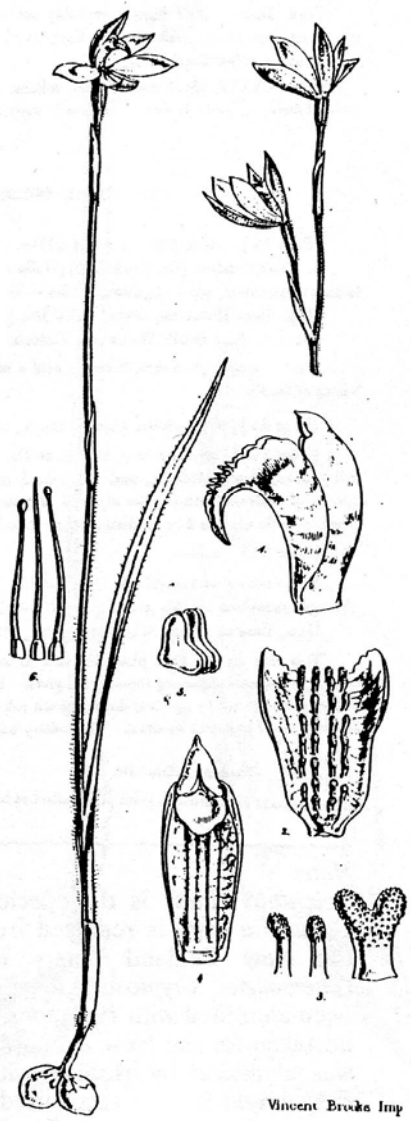
*Caladenia carnea* Br.

*C. congesta* Br.



W. Archer & W. P. Wood del. W. P. Wood lith.

*Caladenia alata*, Br.



Vincent Brooks Imp.

*C. angustata*, Lindl.

1. *Gastrodia sesamoides* (Br. Prodr. 350); radice tuberosa, perianthio breviter urceolato-campulato, columna elongata.—*Lindl. Gen. et Sp. Orchid.* 384; *Enall. Icon. t. 5.* (Gunn, 359, 613.) (TAB. CXXVI.)

HAB. Dense humid forests, probably not uncommon, as at Circular Head, Table Cape, Georgetown, etc., *Lawrence, Gunn, Archer.*—(Fl. Nov., Dec.)

DISTRIB. New South Wales.

PLATE CXXVI. Fig. 1 and 2, ovary, column, and labellum; 3, front view of column; 4 and 5, pollen; 6, grain of ditto; 7, seed; 8, nucleus of ditto in water:—*all magnified.*

#### ADDITIONS, CORRECTIONS, ETC.

(Page 18.) After *Caleana major* add—

2. *Caleana minor* (Br. Prodr. 320); folio anguste lineari canaliculato, scapo medio ebracteato, labelli lamina tuberculata, apice angustato bilobo.—*Lindl. Gen. et Sp. Orchid.* p. 429.

HAB. Near Hobarton, *Gunn.* (Fl. Dec.)

DISTRIB. New South Wales and Victoria.

A much smaller plant than *C. major*, with a narrower leaf, ebracteate scape, smaller flower, with tuberculate lamina of the lip.

(Page 23.) *Chiloglottis Gunnii*, *Lindl.*, has been found in Victoria by *Mueller*.

(Page 24.) *Microtis rara*, Br., is, as Dr. *Lindley* informs me, found in New Zealand (*M. porrifolia*, Spr.), Java, New Caledonia, and the Island of Bonin.—On re-examining the Tasmanian and Australian species of *Microtis* with the descriptions and drawings of this work, I find them to be inextricably confused, and do not see how to discriminate them.

(Page 25.) Add—

3. *Acianthus viridis* (Hook. fil.); floribus 1-3, sepalo dorsali fornicato ovato-lanceolato lateralibusque oblongo-lanceolatis obtusis muticis, petalis brevissimis, labello trapezoidico obtuso.

HAB. Base of Mount Wellington (Oct., Nov., 1839-40), *Gunn.*

This very distinct little plant was sent to me by Mr. *Gunn* in a letter, and, like the *Caleana minor*, arrived only as this sheet was passing through the press. It is of the same size as, and a good deal like, *A. exsertus*, but at once distinguished by its fewer flowers, green colour, blunt sepals, the lateral of which are recurved, minute petals, and very broad trapezoid labellum. The solitary leaf has undulated, almost crenate or sinuate margins.

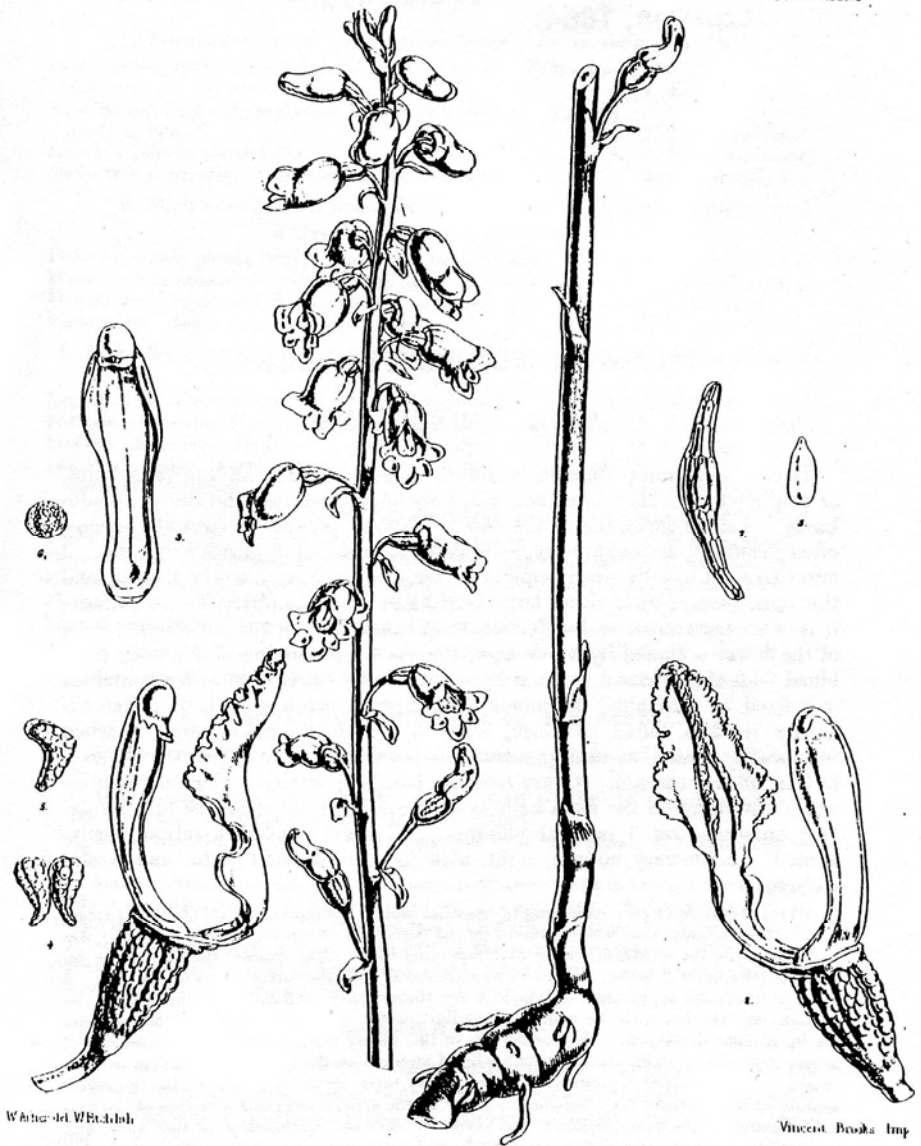
(Page 30.) *Caladenia alata*, Br.

*Archer* remarks that *Brown's* plant is described as having the glands biseriate, and that it has a musky odour.

#### Notes

*Acianthus viridis* is the species named *Townsonia* by *Cheeseman*.<sup>11</sup> *Caladenia alata* is reported from Northland.<sup>12</sup> *Calochilus campestris*: the New Zealand plants rediscovered in the Far North are *C. herbaceus*. *Cryptostylis longifolia* is *C. subulata*. *Pterostylis furcata* has been identified with *P. micromega*.<sup>10</sup> *Pterostylis mutica* was at one time mistaken for the New Zealand species *P. tristis*.<sup>13</sup> *Pterostylis squamata* was identified by *Hooker* with New Zealand plants of *P. plumosa*; *P. squamata* is now recognised as "an extremely rare and distinctive species that appears confined to the southern part of Tasmania".<sup>14</sup>





*Gastrodia sesamoides*, Br.

Handbook of the New Zealand Flora. Hooker J.D.  
London, 1864.

CLASS II. MONOCOTYLEDONS.

ORDER I. ORCHIDÆ.

Herbs, sometimes almost shrubby, either terrestrial with tubers or bulbs, or epiphytes with leafy branches, which are often thickened and called pseudo-bulbs. Leaves sheathing at the base. Flowers bracteate, extremely various, often beautiful, hermaphrodite.—Perianth superior, of 6 pieces in 2 series, 3 outer (*sepals*) usually nearly equal; of the 3 inner 2 are lateral (*petals*); and the innermost (*lip*) is either largest or differs in shape, direction, or surface; it is sometimes superior (or posticus), at others inferior (or anticus). Axis of the flower occupied by a *column* facing the lip, consisting of a stamen combined with the style and reduced apparently to 2-3 masses of *pollen* contained in a fixed or moveable, deciduous or persistent cap-like anther; pollen cohering in 2-3, often pyriform, waxy or granular masses, often attached in pairs by a caudicle to a gland, which is easily detached from the tip (*rostellum*) of the column. Ovary inferior, 1-celled; stigma a glandular depression or swelling on the front or base of the column, opposite the lip; ovules very numerous on 3 parietal placentas. Capsule 1-celled, 3-valved, many-seeded. Seeds very minute, light, with loose reticulated testa, and a solid embryo.

A very extensive Order, abounding in beautiful plants, the flowers always of curious structure. Theoretically the flower consists of 15 parts: viz. 3 sepals; 3 petals; 3 outer stamens, opposite the sepals, of which, that answering to the sepal opposite the lip is alone developed (the other 2 being suppressed and confluent with the lateral veins of the lip); 3 inner stamens all suppressed, of which 2 are theoretically confluent with the sides of the column, and the 3rd with the midrib of the lip; lastly, 3 stigmas, of which, that opposite the lip is alone developed. The correctness of this theory is supported by the presence of 2 lateral appendages which represent undeveloped stamens on the sides of the column of such genera as *Thelymitra*, *Prasophyllum*, etc., and by three crests or ridges on the lip, representing as many others (as *Chiloglottis*); also by the arrangement and direction of the vascular bundles in the ovary, column, and perianth. For the development of this view, and an account of the wonderful processes by which fertilization is effected in this Order by insects, see Darwin's work 'On the Fertilization of Orchids.'

## 1. ARTIFICIAL KEY TO THE GENERA.

A. *Perennial epiphytes, with evergreen leaves. Pollen waxy, except in 1.*

- Stems slender, leafy. Sepals free. Disk of lip naked. Pollen granular . . . . . 1. EARINA.  
 Stem slender, leafy. Lateral sepals adnate with column. Lip with crests on face . . . . . 2. DENDROBIUM.  
 Leaves in pairs on pseudobulbs . . . . . 3. BOLBOPHYLLUM.  
 Stems very short, leafy. Lip concave, middle lobe solid . . . . . 4. SARCOCHILUS.

B. *Stems annual; roots terrestrial, bulbous, tuberous, or rarely creeping.*

a. *Leaf solitary, broad, membranous.*

- Flower 1, sessile, purple, large. Sepals very long, filiform . . . . . 9. CORYSANTHES.  
 Flower 1, long-peduncled. Sepals broad, upper concave . . . . . 8. ADENOCCHILUS.  
 Flowers few. Sepals and petals acuminate or awned . . . . . 6. ACIANTHUS.  
 Flowers few. Sepals and petals linear, obtuse . . . . . 7. CYRTOSTYLIS.

β. *Leaf solitary (rarely 0 in Prasophyllum), slender, flat or terete (2 broad in Caladenia bifolia).*

- Leaf tubular. Flowers many, minute, with the lip below . . . . . 10. MICROTIS.  
 Leaf linear or terete. Flowers many; minute, with the lip uppermost . . . . . 17. PRASOPHYLLUM.  
 Leaf flat, pubescent. Flowers 1-4, pink. Lip glandular . . . . . 11. CALADENIA.  
 Leaf terete, thick. Flowers 1 or more, yellow or blue. Lip sepals and petals all similar . . . . . 15. THELYMITRA.

γ. *Leaves 2 or more, rarely 0 in Pterostylis (see Caladenia bifolia, in β).*

- Flower solitary, large, green, galeate. Lip small, narrow . . . . . 12. PTEROSTYLIS.  
 Flower solitary. Upper sepal arched. Lip with large, purple glands . . . . . 13. CHILOGLOTTIS.  
 Flowers several. Upper sepal galeate. Lip with 3 ridges . . . . . 14. LYPERANTHUS.  
 Flowers several. Upper sepal galeate. Lip 3-lobed . . . . . 18. ORTHOCERAS.  
 Flowers numerous. Upper sepal oblong. Lip with crumpled edges . . . . . 16. SPIRANTHES.

δ. *Leaves 0. Stem stout, with brown sheathing scales.*

- Flowers numerous, brown. Sepals united in an urceolate tube . . . . . 5. GASTRODIA.

## 2. NATURAL CLASSIFICATION OF THE GENERA.

1. Anther terminal, deciduous. Pollen masses granular, attached to a short caudicle:—  
1, EARINA.

2. Anther terminal, deciduous. Pollen masses waxy, attached to a broad caudicle:—  
2, DENDROBIUM; 3, BOLBOPHYLLUM; 4, SARCOCHILUS.

3. Anther terminal, deciduous. Pollen masses of large loose grains, without caudicle:—  
5, GASTRODIA.

4. Anther terminal, persistent. Pollen masses attached by their bases to the stigmatic gland:—6, ACIANTHUS; 7, CYRTOSTYLIS; 8, ADENOCCHILUS; 9, CORYSANTHES; 10, MICROTIS; 11, CALADENIA; 12, PTEROSTYLIS; 13, CHILOGLOTTIS; 14, LYPERANTHUS.

5. Anther parallel to the stigma, at the back of the column, persistent. Pollen masses attached by threads to the stigmatic gland:—15, THELYMITRA; 16, SPIRANTHES, 17, PRASOPHYLLUM; 18, ORTHOCERAS.

## 1. EARINA, Lindley.

Rigid, erect, tufted epiphytes. Stems leafy, simple, compressed. Leaves distichous, narrow linear, numerous. Flowers small, whitish, in terminal simple or branched bracteate spikes or panicles.—Sepals and petals nearly equal, spreading, ovate or oblong. Lip superior, sessile or shortly stalked, 3-lobed, disk eglandular, lateral lobes incurved. Column short. Pollen-masses 4, granular, united in pyriform pairs to a small short caudicle, which comes away with them.

A small genus, confined, as at present known, to New Zealand. The two species were confounded by Cunningham.

Leaves 4-6 in. long, acuminate. Panicles slender . . . . . 1. *E. mucronata*.  
Leaves 2-3 in. long, obtuse or acute. Panicle stiff . . . . . 2. *E. autumnalis*.

1. *E. mucronata*, Lindl.;—*Fl. N. Z.* i. 239. Stems slender, 1-3 ft. long, two-edged. Leaves narrow linear or strap-shaped, 4-6 in. long,  $\frac{1}{2}$  in. broad, acuminate. Panicle slender, sparingly branched. Flowers remote,  $\frac{1}{4}$  in. diam.; bracts obtuse. Sepals and petals linear-oblong. Lip deeply 3-lobed, spotted.—Hook. Ic. Pl. t. 431.

Common throughout the **Northern** and **Middle** Islands, *Banks and Solander*, etc.

2. *E. autumnalis*, Hook. f. *Fl. N. Z.* i. 239. Stems stout, 1-1 $\frac{1}{2}$  ft. high, slightly compressed. Leaves narrow linear, 2-3 $\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. broad, rigid, nerved and striated. Panicle short, stiff, usually distichously branched. Flowers as in *E. mucronata*, but crowded, white, speckled; bracts short, obtuse, imbricated. Sepals broadly oblong. Petals ovate. Lip broad, obscurely 3-lobed, retuse.

Throughout the **Northern** and **Middle** Islands, not uncommon, *Banks and Solander*, etc.

## 2. DENDROBIUM, Linn.

Rigid, tufted, epiphytes. Stem stout or slender, leafy. Leaves distichous, numerous, usually narrow. Flowers paniced racemed or axillary and solitary, usually large and handsome.—Sepals spreading, the lateral adnate to the base of the column. Petals usually smaller. Lip inferior or superior, sessile and jointed on to the base of the column or adnate to it, usually large and 3-lobed, disk often with ridges or plates. Column semiterete, usually produced at the base. Pollen-masses 4, adhering in pairs to a strap-shaped caudicle.

A very large Asiatic, Australian, and Pacific Island tropical and subtropical genus, containing many most beautiful species, cultivated extensively in England; these differ greatly in habit, foliage, and inflorescence.

1. *D. Cunninghamii*, Lindl.;—*Fl. N. Z.* i. 240. Stems tufted, pendulous, slender, rigid, polished, branched, 1-2 ft. long. Leaves numerous, 1-1 $\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad, linear, acuminate, pale green, striated, 3-nerved. Flowers in axillary slender 2- or many-flowered racemes, which are shorter than the leaves,  $\frac{3}{4}$  in. diam., pale rose-coloured; pedicels slender; bracts short. Sepals acute, upper narrow, lower broad produced into a short spur behind. Petals as long, oblong, obtuse. Lip with a short claw, adnate to the lateral sepals and column, 3-lobed, lateral lobes small, middle broader than long, wavy, retuse or truncate; disk with 5 plates.—*D. biflorum*, A. Rich. not Swartz.

Throughout the **Northern** and **Middle** Islands, abundant, *Banks and Solander*, etc. Very nearly related to the South Sea Island *D. biflorum*.

## 3. BOLBOPHYLLUM, Thouars.

Very coriaceous, tufted epiphytes, with running matted stems bearing fleshy green tubers (pseudobulbs), each crowned with 1 or 2 leaves.—Flowers soli-

tary or spiked on a scape rising from the base of the pseudobulb; their structure very similar to *Dendrobium*, but the column is very short, produced at the tip into 2 short horns.

A large genus, with the same distribution as *Dendrobium*.

1. **D. pygmæum**, *Lindl.*;—*Fl. N. Z.* i. 240. Minute, forming patches on mossy trunks of trees. Pseudobulbs as large as a pea. Leaf solitary, sessile, coriaceous, linear-oblong,  $\frac{1}{4}$  in. long, grooved down the middle. Flowers minute, solitary, on a short bracteate scape. Upper sepal convex, subacute; lateral, broadly ovate, acute. Petals shorter, linear-oblong, obtuse. Lip ovate, obtuse, disk with thickened lines down the centre. Ovary gibbous, hairy.—*Dendrobium pygmæum*, *Smith*.

Throughout the **Northern** and **Middle** Islands: common, *Banks and Solander*, etc.

#### 4. SARCOCHILUS, Br.

Small, coriaceous epiphytes. Stems short. Leaves distichous, linear-oblong. Flowers large or small, in bracteate spikes or racemes.—Perianth fleshy, open. Sepals nearly equal, obtuse, lateral adnate to the base of the lip. Petals smaller, obtuse. Lip continuous with the column, concave, fleshy; spur 0. Column short, erect. Anther terminal. Pollen-masses 4, waxy, cohering in globose pairs, attached to a broad strap-shaped caudicle, which is fixed to the gland of the stigma.

A small genus, native of subtropical Australia, the Fiji and Malay Islands.

1. **S. adversus**, *Hook. f. Fl. N. Z.* i. 241. Roots long, wiry, straggling. Stems short, 1–2 in. long. Leaves few, linear-oblong, obtuse or subacute, 1–2 in. long, jointed near the base when dry. Scape 1–2 in. long, subterminal, slender. Spike 1 in. long, 10–20-flowered, rachis thickened. Flowers minute, yellow-green,  $\frac{1}{16}$  in. diam. Sepals oblong-ovate, obtuse. Petals linear-oblong, obtuse. Lip subquadrate, obscurely lobed.

**Northern** Island: Oparagi, *Banks and Solander*; Bay of Islands and Wairanaka Valley, *Colenso, Edgerley*. A very small-flowered species, compared with the Australian.

#### 5. GASTRODIA, Br.

Tall, slender, leafless, whitish or brown terrestrial herbs. Root long, thick, fleshy, twisted, or tuberous. Stem with sheathing brown scales. Flowers racemed, pendulous, dirty-white or brownish.—Perianth gibbous at the base, subcampanulate or urceolate. Sepals united into a tube to near their tips, which are shortly reflexed; petals smaller, adnate to the tube, their tips reflexed exerted. Lip included, superior, clawed, linear-oblong; margins erenulate. Column short or long, scarcely winged, without lateral appendages. Anther terminal, horizontal, 2-celled, deciduous. Pollen-masses 4, united in pairs, curved, free, composed of very large grains. Stigma at the base of the column, with a free opening to the ovary. Ovary small.

A curious genus, found in Australia and Tasmania, New Zealand, and the Indian Islands.

1. **G. Cunninghamii**, *Hook. f., Fl. N. Z.* i. 251. Root sometimes 18 in. long, very stout. Stem 1–2 ft. high; scales scarious, short, distant, al-

ternate or opposite and connate. Racemes 6-10 in. long. Flowers 10-20, dirty-green, spotted with white; bracts short, scarious. Perianth fleshy,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Claw of lip winged, blade linear-oblong, membranous, wavel, with 2 thick ridges down the middle. Column very short.—*G. sesumoides*, Br.?, A. Cunn.

**Northern and Middle Islands:** in damp shaded woods, not uncommon, but easily overlooked; Bay of Islands, etc., *A. Cunningham*; Port Preservation, *Lyall*; Haast's Pass, Lake Wanaka, etc., *Haast*. The root is full of starch and mucilage, and was eaten by the natives. Odour of plant aromatic but disagreeable (*Haast*).

## 6. ACIANTHUS, Br.

Slender, small, flaccid herbs. Root of tubers at the end of long fibres. Leaf 1, sessile, cordate. Racemes few-flowered. Flowers rather large, green or brown, spreading.—Sepals and petals slender, acuminate or curved, upper sepal sometimes broad. Lip pendulous, or pointing forwards, entire, with 2 glands at the base, and sometimes a glandular disk or tip. Columns slender, terete, arched. Anther small, terminal. Pollen-masses 3, or 4 each 2-partite, powdery.

A small Australian, Tasmanian, and New Zealand genus.

1. **A. Sinclairii**, *Hook. f. Fl. N. Z. i. 246*. Stem 1-3 in. high, very delicate. Leaf broadly cordate, deeply 2-lobed at the base, acuminate,  $\frac{1}{2}$ -1 in. long. Flowers 2-6, green,  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam. Bracts short, ovate, acute. Sepals linear-subulate, aristate, upper broad, 3-nerved; lateral narrower, 1-nerved, toothed towards the tip. Petals small, lanceolate. Lip ovate-lanceolate, with 2 glands at the base, and a thickened tip.

Common throughout the **Northern** Island. **Kermadec** Island: *M Gillivray*.

## 7. CYRTOSTYLIS, Br.

Habit of *Acianthus*, but sepals and petals not acuminate or awned, and column winged above.

A small genus of Australian, Tasmanian, and New Zealand plants.

Leaf oblong . . . . . 1. *C. oblonga*.  
Leaf orbicular, deeply 2-lobed at the base . . . . . 2. *C. rotundifolia*.

1. **C. oblonga**, *Hook. f. Fl. N. Z. i. 246*. Very slender, 1-3 in. high. Leaf oblong or oblong-cordate, obtuse or acute, cordate or rounded at the base. Flowers 1-3, nearly  $\frac{1}{2}$  in. diam. Sepals and petals nearly equal, narrow linear, acute. Lip as long as the sepals, linear-oblong, obtuse or rather truncate at the tip, with 2 small glands at the base.

**Northern** Island and northern parts of the **Middle** Island: frequent in shaded woods, *Sinclair*, *Colenso*, *Travers*, etc.

2. **C. rotundifolia**, *Hook. f. Fl. N. Z. i. 246*. Quite similar to *C. oblonga*, but the leaf is orbicular, and often 1-1 $\frac{1}{2}$  in. diam.

**Northern** Island: east coast, Raukawa ridge, Cape Kidnapper, etc., *Colenso*. My *C. macrophylla* is, I think, nothing but a large state of this, which may itself prove to be a variety of *C. oblonga*.

8. **ADENOCHILUS**, Hook. f.

A very slender glabrous herb. Stem simple, with one sessile, ovate, acute leaf in the middle, 1-flowered.—Perianth downy. Upper sepal concave, acuminate, adnate to the back of the column; lateral oblique, 3-nerved, lanceolate, placed under the lip. Petals suberect, linear-lanceolate. Lip shortly clawed, 3-lobed, middle lobe caudate, disk and middle lobe with about 4 rows of stipitate glands. Column slender, curved, winged; wings produced upwards into 2 toothed lobes. Anther hidden behind the stigma and between the lobes of the column, persistent. Ovary very long, erect.

A curious genus, of but one species, allied to *Caladenia*, *Chiloglottis*, and the Australian genus *Eriochilus*.

1. **A. gracilis**, Hook. f. *Fl. N. Z.* i. 246. t. 56 A. Stem 6–10 in. high. Leaves membranous, acute,  $\frac{3}{4}$  in. long; sheath short. Stem above the leaf with one sheathing bract in the middle, and another at the base of the peduncle. Ovary  $\frac{1}{2}$ – $\frac{3}{4}$  in. long. Perianth  $\frac{1}{2}$  in. broad; segments all very acuminate, veined. Lip small, concealed within the perianth. Anther orbicular, mucronate.

**Northern Island**: Bay of Plenty, *Colenso*.

9. **CORYSANTHES**, Brown.

Very small, delicate, succulent, terrestrial herbs. Root of small tubers on slender caulicles. Leaf 1, very broad. Flower 1, large, purple, almost sessile on the leaf; peduncle elongating after flowering.—Upper sepal very large, long, curved forward from the base, narrow boat- or helmet-shaped; lateral free or connate at the base, very small, or long and filiform. Petals usually very small. Lip very concave or involute, usually fimbriate at the edges. Column short or slender. Anther terminal, 1-celled, persistent. Pollen-masses 4, powdery.

A remarkable genus of beautiful little plants, natives of the Malayan islands, temperate Australia, and New Zealand. The genus *Nematoceras*, established in the New Zealand Flora, I think merges into *Corysanthes* through the Malayan species. The species are difficult of discrimination, and perhaps are not all permanently distinct.

Leaf reniform, 3-lobed at the tip. Lip 2-partite, recurved . . . . .	1. <i>C. triloba</i> .
Leaf oblong-ovate; petiole short. Lip convolute, truncate, toothed . . . . .	2. <i>C. oblonga</i> .
Leaf orbicular-cordate . . . . .	3. <i>C. rotundifolia</i> .
Leaf ovate-oblong orbicular or cordate; petiole short. Lip tubular, recurved . . . . .	4. <i>C. rivularis</i> .
Robust. Leaf large, cordate; petiole and scape very thick. Lip broad, recurved, undulate . . . . .	5. <i>C. macrantha</i> .

1. **C. triloba**, Hook. f.—*Nematoceras*, *Fl. N. Z.* i. 250. Leaf  $\frac{3}{4}$ –1 $\frac{1}{4}$  in. diam., membranous, orbicular-reniform, 3-lobed at the very tip; middle lobe acute; petiole  $\frac{1}{2}$ –3 in. long. Peduncle sometimes 8 in. long after flowering. Flower  $\frac{1}{3}$  in. long. Lateral sepals and petals filiform, sometimes 2 in. long, 5 times longer than the lip; upper dilated and obtuse at the tip. Lip very large, of 2 large recurved lobes, margins nearly entire. Column very small.

**Northern Island**: damp woods, east coast, Cape Palliser, Cape Titikura, etc., *Colenso*; Auckland, *Sinclair*; Otago, *Hector and Buchanan*. The Middle Island specimens alluded

to in Fl. N. Z., I think are rather referable to *C. macrantha*, which differs in the much larger size, very coriaceous, rarely 3-lobed leaf.

2. *C. oblonga*, *Hook. f.*—*Nematoceras*, Fl. N. Z. i. 249. t. 57 B. Leaf  $\frac{3}{4}$ –1½ in. long, sessile, membranous, ovate-oblong, apiculate, rarely subcordate at the base. Flower small,  $\frac{1}{2}$ – $\frac{1}{4}$  in. long, on a short scape. Upper sepal rather narrow; lateral and petals filiform,  $\frac{2}{3}$ –1 in. long. Lip involute and truncate, when spread out broadly cordate, deep blood-red; margin pale, toothed. Column short, curved.

**Northern** Island, *Edgerley*; interior, *Coleenso*; **Auckland**, *Captain Haultain*. **Middle** Island: *Nelson*, *Travers*; *Otago*, *Hector* and *Buchanan*.

3. *C. rotundifolia*, *Hook. f.*—*Nematoceras*, Fl. N. Z. i. 251. Leaf sessile or petioled,  $\frac{1}{2}$ –1 in. diam., membranous, orbicular, acute or apiculate, cordate or 2-lobed at the base. Flower subsessile, very small,  $\frac{1}{4}$ – $\frac{1}{2}$  in. diam. Upper sepal rather narrow, lateral and petals filiform. Lip involute, truncate as in *C. oblonga*.

**Northern** Island: *Manawata* harbour, etc., *Coleenso*. **Middle** Island: *Nelson*, *Travers*. **Lord Auckland's** group and **Campbell's** Islands, *J. D. H.* Perhaps a variety of *C. oblonga*.

4. *C. rivularis*, *Hook. f.*—*Nematoceras*, Fl. N. Z. i. 251. Leaf nearly sessile, orbicular ovate ovate-cordate or oblong-cordate, obtuse acute or acuminate, membranous, often 2-lobed at the base. Flower  $\frac{1}{2}$ – $\frac{1}{2}$  in. long. Upper sepal narrow, acuminate; lateral and petals filiform, 1–1½ in. long. Lip involute, when spread open trowel-shaped, recurved; tip retuse or apiculate; margins undulate.—*Acianthus rivularis*, *A. Cunn.*

**Northern** and **Middle** Islands: common on mossy trees, etc., in shady ravines. **Lord Auckland's** group, *Bolton*.

5. *C. macrantha*, *Hook. f.*—*Nematoceras*, Fl. N. Z. i. 249. Much the largest and stoutest species, often 6–10 in. high. Leaf usually with a long very stout petiole, 1–1½ in. broad, coriaceous or fleshy, oblong-orbicular, cordate or 2-lobed at the base, obtuse or apiculate, rarely 3-lobed, with a broad thickened margin, much reticulate. Flowers on short scapes at the base of the petiole,  $\frac{1}{2}$ –1 in. long, lurid purple. Upper sepal narrow, acuminate; lateral and petals very narrow linear, almost filiform, 1–2 in. long. Lip large, recurved, very broad, almost 2-lobed, strongly undulate.

Throughout the central parts of the **Northern** and all the **Middle** Island: not uncommon in damp shady woods, *Coleenso*, etc. **Lord Auckland's** group, *Bolton*.

## 10. MICROTIS, Banks and Solander.

Erect, slender, green herbs. Root of oblong tubers. Leaves 1–2 in., very slender, sheathing at the base. Flowers minute, green, spiked, fleshy, spreading.—Sepals: upper connivent with the petals, and together with them forming a hood; lateral placed under the lip. Petals small, ascending. Lip pendulous, small, entire, sessile, with 2 thickened glands at the base. Column short, with 2 lateral lobes; anther terminal. Pollen-masses 4, powdery.

A genus of several Australian and a few New Caledonian, Java, and New Zealand species.

1. *M. porrifolia*, *Sprengel*;—*Fl. N. Z.* i. 245. Very variable in



stature, robustness, and number of flowers, 6-24 in. high. Leaf solitary, terete, tubular. Spike 1-6 in. long, 20-80-flowered. Flowers  $\frac{1}{2}$  in. long; bracts very short. Upper sepal broadly ovate. Lip oblong, obtuse, crenate or crisped, rounded or obscurely 2-lobed at the tip, with 2 glandular lumps at the base and 1 towards the tip.—*M. Banksii*, A. Cunn.; *Epipactis purrifolia*, Swartz; *Ophrys unifolia*, Forst.

Throughout the **Northern** and **Middle** Islands: abundant, *Banks and Solander*, etc.

## 11. CALADENIA, Br.

Slender, small, pubescent pilose or villous herbs. Roots of small tubers terminating underground caulicles. Leaf solitary (rarely 2), radical or cauline, sheathed at its base. Scape 1-4-flowered; bract 1 or 0.—Perianth open, suberect, 2-lipped, glandular. Upper sepal erect or arched, lateral placed under the lip. Petals erect or spreading. Lip clawed, concave, 3-lobed, obovate or trowel-shaped; disk with rows of stipitate glands. Column slender, curved, winged above. Anther terminal, exposed, mucronate. Pollen-masses 4.

A large extratropical Australian, Tasmanian, and New Zealand genus.

Leaf solitary, linear. Scape very slender. Flower  $\frac{1}{4}$ - $\frac{1}{2}$  in. . . . . 1. *C. minor*.  
 Leaf solitary, linear. Scape stout. Flower  $\frac{1}{4}$ -1 in. . . . . 2. *C. Lyallii*.  
 Leaves 2, oblong. Scape stout. Lip undivided . . . . . 3. *C. ? bifolia*.

1. ***C. minor***, *Hook. f. Fl. N. Z. i. 247. t. 56 B.* A small, very slender herb, 2-8 in. high, pilose with spreading hairs. Leaf very narrow, linear, at the very base of the stem. Flower 1, rarely 2, pink,  $\frac{1}{4}$ - $\frac{1}{2}$  in. diam. Sepals linear, obtuse, narrower than the petals. Lip broad, 3-lobed; lateral lobes broad, banded with purple; middle subulate, glandular at the margin; disk with 2 series of stipitate glands.

**Northern** Island: dry clay hills, abundant. **Middle** Island: Otago, *Lyall*.

2. ***C. Lyallii***, *Hook. f. Fl. N. Z. i. 247.* Much stouter than *C. minor*, with longer spreading hairs, 4-5 in. high. Leaf narrow linear, sometimes  $\frac{1}{2}$  in. broad. Scape stout, curved, 1-2-flowered. Flowers  $\frac{1}{2}$ -1 in. diam. Sepals obovate-oblong, acute or obtuse and apiculate; upper shorter, arched. Petals narrower. Middle lobe of lip subulate, recurved. Other characters as in *C. minor*.

**Middle** Island: Gordon's Nob. *Munro*; swampy places, Hurumui mountains, Lake Tennyson, and Mount Brewster, alt. 4-5000 ft., *Haast, Travers*; Otago, grassy places, *Lyall*. **Lord Auckland's** group, immature, *J. D. H.* Very closely allied indeed to the Tasmanian *C. carnea*.

3. ***C. (?) bifolia***, *Hook. f. Fl. N. Z. i. 247.* Glandular-pubescent, 3-5 in. high, rather stout. Leaves 2, radical, oblong, spreading,  $\frac{3}{4}$ -1 $\frac{1}{4}$  in. long, pubescent or ciliated. Scape stout, 1-flowered, ebracteate. Flower erect,  $\frac{3}{4}$ -1 in. broad. Sepals obtuse; upper linear-oblong, obtuse, suberect; lateral and petals linear, nearly equal. Lip broad, almost sessile, orbicular-obovate, membranous, quite entire, with 2 short narrow lines of glands near the base.

**Northern** Island, *Colenso*. **Middle** Island: Lake Tennyson, alt. 4400 ft., *Travers*; Mount Brewster, alt. 4-5000 ft., *Haast*; grassy hills, Otago, *Lyall*. **Lord Auckland's**

group, *J. D. H.* A singular plant, differing from *Caladenia* in several respects, but hardly generically.

## 12. PTEROSTYLIS, Br.

Usually slender, leafy, erect, simple, rather succulent, glabrous herbs. Roots of small tubers terminating underground caudicles. Leaves radical or cauline, sheathing at the base. Flowers 1 in the N. Zealand species, membranous, green.—Perianth closed or open. Upper sepal and petals combined or conniving and forming a very concave boat-shaped hood; lateral sepals connate, ascending or deflexed. Lip small, clawed, its tip exerted between the free tips of the lateral sepals, or wholly exposed, often irritable, furnished with an erect or curved appendage at the base. Column slender, curved, broadly winged above. Anther terminal, persistent. Pollen-masses 4.

A large temperate Australian, Tasmanian, and New Zealand genus, not found elsewhere.

A. *Lateral sepals erect. Lip glabrous, included, or the tip only exerted.*

*Leaves all cauline, or cauline and radical, all similar or nearly so.*

Flower 2-3 in. long. Leaves all linear, grass-like . . . . . 1. *P. Banksii.*

Like *P. Banksii*, but smaller. Flower  $\frac{3}{4}$ -1 in. long . . . . . 2. *P. graminea.*

Lower leaves oblong. Flower 1 in. long . . . . . 3. *P. micromega.*

*Radical leaves broad, cauline reduced to bracts.*

Glabrous. Leaves oblong. Bracts large, sheathing . . . . . 4. *P. foliata.*

Glabrous. Leaves long-petioled, ovate-cordate . . . . . 5. *P. trullifolia.*

Puberulous. Leaves short-petioled, ovate-cordate . . . . . 6. *P. puberula.*

B. *Lateral sepals deflexed. Lip filiform, plumose, exerted* . . . . . 7. *P. squamata.*

1. ***P. Banksii***, *Brocu*; — *Fl. N. Z.* i. 248. Tall, leafy, 6-18 in. high. Leaves numerous, alternate, sheathing the whole stem, rising above the flower, narrow linear-lanceolate, acuminate. Flower solitary, 2-3 in. long. Upper sepal arched forwards, and lateral produced into long slender tails. Lip linear, glabrous, its tip exerted; appendage linear, curved, villous at the tip.—*Bot. Mag.* t. 3172.

Var.  $\beta$ . Leaves broader,  $\frac{1}{2}$ - $\frac{3}{4}$  in. Sepals less produced into long tails. *P. australis*, *Hook. f. Fl. N. Z.* i. 248.

Abundant throughout the **Northern** and **Middle** Islands to Otago, *Banks* and *Solander*, etc. Var.  $\beta$ , **Middle** and **Southern** Islands: Port William and Thomson's Sound, *Lyall*.

2. ***P. graminea***, *Hook. f. Fl. N. Z.* i. 248. Slender, leafy, 6-10 in. high. Leaves sheathing, narrow linear-lanceolate, 1-3 in. long. Flowers solitary,  $\frac{3}{4}$ -1 in. long, of the same form as *P. Banksii*, but much smaller, and the sepals less produced into slender tails.

**Northern** and **Middle** Islands, not uncommon: east coast, *Colenso*; Auckland, *Sinclair*; Otago, *Lyall*. Probably only a small state of *P. Banksii*, but approaching the Australian *P. macro*.

3. ***P. micromega***, *Hook. f. Fl. N. Z.* i. 248. Slender, 3-8 in. high, leafy. Lower leaves large, ovate-oblong or lanceolate, obtuse or acute, sessile or petioled,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. long; cauline smaller, more acuminate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. Flower solitary, suberect, 1 in. long. Upper sepal narrow, slightly arched, caudate-acuminate; lateral erect, with narrow slender points. Petals narrow, acuminate. Lip glabrous, its tip exerted; appendage villous.

**Northern** Island, *Edgerley*; east coast, and bogs near Wairarapa, *Colenso*; Coromandel gold-fields, *Jolliffe*. Approaching the Australian *P. cucullata*, but smaller.

4. ***P. foliata***, *Hook. f. Fl. N. Z.* i. 249. Rather stout, scapigerous,

2-10 in. high, quite glabrous. Leaves: radical petioled, oblong or elliptic-oblong, 1-2½ in. long, obtuse; cauline reduced to 1 or 2 large, erect, sheathing bracts, ¾-1¼ in. long. Flower solitary, erect, ½-¾ in. long. Upper sepal much curved towards the tip, acuminate; lateral erect, their points filiform, exceeding the upper. Petals as long as the upper sepal, obtuse or subacute. Lip glabrous, its tip a little exerted; tip of appendage villous.

**Northern Island:** east coast, bogs near Oroi; hillsides, Cape Palliser; Wairarapa valleys; and tops of the Ruahine mountains, *Coleenso*.

5. ***P. trullifolia***, *Hook. f. Fl. N. Z. i. 249*. Small, slender, glabrous, 2-5 in. high. Leaves radical, or towards the base of the scape, petioled, broadly ovate or orbicular-cordate or trowel-shaped, obtuse or acute, ¼-½ in. long; petiole slender. Bracts 3-5, spreading, lanceolate, acuminate, the lower sometimes petioled. Flower solitary, erect, ½ in. long. Upper sepal abruptly arched forward beyond the middle, acuminate; lateral erect, their points filiform, longer than the upper. Petals narrow, acuminate. Lip glabrous, its tip shortly exerted; tip of appendage villous.

**Northern Island:** Bay of Islands, *Edgerley*, *Coleenso*, etc.

6. ***P. puberula***, *Hook. f. Fl. N. Z. i. 249*. Small, slender, puberulous, especially below, 3-5 in. high. Leaves radical, crowded, small, short, shortly petioled, ¼-½ in. long, ovate-cordate, acute. Bracts numerous, erect, sheathing, lanceolate, acuminate. Flower erect, solitary, ½-¾ in. long. Upper sepal slightly arched, acute; lateral erect, thin; points filiform, as long as or exceeding the upper. Petals broad, as long as the upper sepal, tips broad, obtuse or truncate. Lip with the tip exerted; tip of appendage divided.

**Northern Island,** *Coleenso*; Auckland, *Sinclair*. Very closely allied to the Tasmanian *P. nana*.

7. ***P. squamata***, *Brown*;—*Fl. N. Z. i. 249*. Stout, glabrous, erect, 3-8 in. high. Leaves radical, crowded, sessile, erect, ½ in. long, ovate-lanceolate, acuminate; bracts 3-4, sheathing, acuminate. Flower solitary, ¾-1 in. long. Upper sepal slightly arched, acuminate; lateral reflexed, their tips linear, straight. Petals linear-subulate. Lip filiform, exerted, pendulous, plumose with long golden hairs, terminated by a large purple gland; appendage curved, villous at the tip. Wings of column each with a long erect tooth.

**Northern Island:** Auckland, *Sinclair*. Also a native of Tasmania and east and west temperate Australia.

### 13. CHILOGLOTTIS, Br.

Erect, rather stout, scapigerous, small herbs. Roots of small tubers at the end of underground caudices. Leaves 2, at the base of the stem. Scape with 1 bract and 1 flower. Flowers suberect, lurid purple; peduncle lengthening after flowering.—Perianth 2-lipped. Upper sepal arched; lateral placed under the lip. Petals ascending or reflexed. Lip with a claw, with large glands or protuberances at the base and on the disk. Column long, 2-fid at the tip. Anther terminal, persistent. Pollen-masses 4.

A small south-east Australian and Tasmanian genus, with one Auckland Island species.

1. ***C. cornuta***, *Hook. f. Fl. Antarct. i. 69*. A small herb, 2-4 in. high. Leaves 1-1½ in. long, linear-oblong, acute; veins reticulate. Scape

stout, lengthening much after flowering. Flower  $\frac{1}{2}$  in. diam. Upper sepal ovate-lanceolate, acuminate; lateral linear. Petals erect, short, ovate, acuminate. Lip trowel-shaped, shortly clawed, acuminate, with a horn-like projection at the base of the disk, one broader protuberance on each side of it, and 3 broad, flat tumid purple glands on the surface.

**Lord Auckland's** group, *Bolton*. **Campbell's** Island: mossy shady places, *Lyall*.

#### 14. LYPERANTHUS, Br.

Erect, rather stout, leafy, glabrous, terrestrial herbs. Root tuberous. Leaves sheathing at the base; bracts large. Flowers spiked or racemed, lurid, rather fleshy.—Upper sepal large, arched, concave, boat-shaped; lateral small, deflexed. Petals similar to the lateral sepals, spreading or reflexed. Lip small, sessile, ascending, entire, oblong; disk with small ridges or glands. Column short; anther erect, persistent. Pollen-masses 4, granular.

A small Australian, Tasmanian, New Caledonian, and New Zealand genus.

1. **L. antarcticus**, *Hook. f. Fl. Antarct.* ii. 544. A span high, stout. Leaves 1-3, linear-oblong or oblong-lanceolate, 1-2 in. long, upper smaller. Flowers 2 or 3; bracts large, cucullate,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long. Perianth horizontal,  $\frac{1}{2}$  in. long. Upper sepal very deeply arched, helmet-like, acute; lateral and petals linear-subulate, falcate, acute. Lip broad, ovate-oblong, obtuse, with 5 slender ridges on the disk. Column rather slender, arched.

**Middle** Island: open land, Waipori Creek, alt. 2500 ft., *Hector and Buchanan*. **Lord Auckland's** Islands, *Le Guillon, Bolton*.

#### 15. THELYMITRA, Forst.

Erect, stout or slender, scapigerous, glabrous herbs. Roots of ovoid tubers. Stem with a membranous sheath below the leaf. Leaves 1 or rarely 2, narrow, much elongated, thick and coriaceous. Flowers few, spiked or racemed.—Perianth spreading. Sepals and petals all oblong ovate or obovate, equal and nearly similar. Lip like the petals, but rather smaller. Column hooded, 3-fid; lateral lobes (staminodia) erect or prominent, crenate or produced into feathery appendages; middle small, entire, notched or 3-fid. Anther posticous, almost hidden between the lateral lobes of the column, attached to the middle one, persistent. Pollen-masses 4, fixed to the gland of the stigma, powdery.

A large Australian and Tasmanian genus, also found in New Zealand and the lofty mountains of Java. The species are most difficult of discrimination in a fresh state and impossible in a dried one; and the following all require revision. The only good characters I have been able to find are in the length and direction of the lateral lobes of the column.

*Flowers blue or purple.*

Column much longer than its short plumose appendages . . . . .	1. <i>T. longifolia</i> .
Column longer than its erect toothed appendages . . . . .	2. <i>T. pulchella</i> .
Column as long as its erect 2-toothed appendages . . . . .	3. <i>T. uniflora</i> .

*Flowers yellowish, few, 1-3. Stems slender.*

Column much shorter than its erect plumose appendages . . . . .	4. <i>T. Colensoi</i> .
Column as long as its crenate or fimbriate appendages . . . . .	5. <i>T. imberbis</i> .

1. **T. longifolia**, *Forst. Char. Gen.*—*T. Forsteri*, Swartz;—*Fl. N. Z.* i. 243. Stout or slender, 8-16 in. high. Leaf variable,  $\frac{1}{2}$ -1 in. broad, linear, very narrow and channelled or long linear-lanceolate, nerved and flat, coria-

ceous. Spike 2-10-flowered. Flowers excessively variable in size; sepals blue or purple,  $\frac{1}{4}$ - $\frac{3}{4}$  in. diam.; petals paler; both ovate-lanceolate, acute. Lip obovate. Column with rounded tip, the appendages excessively short, villous anteriorly.—*T. stenopetala*, Hook. f. Fl. Antarct. i. 69; *Serapias regularis*, Forst. Prodr.

Abundant throughout the **Northern** and **Middle** islands, *Banks and Solander*, etc. **Lord Auckland's** Island, *J. D. H., Bolton*. A most variable plant in stature and robustness, the length and breadth of the bracts and leaves, and the number and size of the flowers. Apparently identical with the Tasmanian and Australian *T. nuda*, Br.

2. **T. pulchella**, Hook. f. Fl. N. Z. i. 244. A very handsome species, differing from *T. longifolia* in the usually broader sepals and petals, and the longer, erect, toothed appendages of the column. Flowers  $\frac{3}{4}$ -1 in. diam., fine blue-purple.

**Northern** Island, *Colenso*. **Middle** Island: Moutere hills, *Munro*; Otago, *Lyall*. Probably a state of *T. Forsteri*.

3. **T. uniflora**, Hook. f. Fl. N. Z. i. 70. Short, stout, 6-8 in. high. Leaf narrow-linear, fleshy, obtuse, channelled, curved, shorter than the scape. Flowers 1-3, pale blue,  $\frac{1}{3}$ - $\frac{1}{2}$  in. diam. Sepals and petals linear-oblong, acute or acuminate. Lip obovate-cuneate. Appendages of column erect, linear, 2-fid at the tip.

**Middle** Island: Milford Sound, *Lyall*. **Lord Auckland's** group, *Le Guillou*, etc.

4. **T. Colensoi**, Hook. f.—*T. pauciflora*, Fl. N. Z. i. 244, not Br. Very slender, 8-12 in. high. Leaf very narrow linear, flexuous. Flowers 1-3, yellowish, on slender pedicels,  $\frac{1}{3}$  in. broad. Sepals and petals very narrow, linear-oblong, acute. Column very short; appendages very long, subulate, erect, plumose at the tip. Anther with a long point.

**Northern** Island, *Colenso*. This differs from all the other species, and from the Australian *T. pauciflora*, to which I had united it, in the very narrow sepals and petals, very short column, and very long erect appendages.

5. **T. imberbis**, Hook. f. Fl. N. Z. i. 244. Small, slender, 4-10 in. high. Leaf very narrow linear. Flowers 1 or 2, yellowish, about  $\frac{1}{2}$  in. diam. Sepals and petals very broad, orbicular-ovate, obtuse. Column rather short; appendages curving upwards and forwards, with crenate fimbriate or slightly villous tips. Anther with a long broad point.

**Northern** Island, *Colenso*. Much better specimens of this and the preceding are wanted to establish their distinctness; this is very like the Tasmanian *T. carnea*, but the flowers are said to be yellow.

## 16. SPIRANTHES, Richard.

Terrestrial, erect, glabrous or puberulous herbs. Root of unbranched fibres or much divided tubers. Stem simple, leafy. Flowers spiked or racemed.—Perianth nearly closed. Lateral sepals usually saccate at the base; upper ascending. Petals similar but narrower. Lip inferior, shortly clawed, quite entire, concave, embracing the column at its base. Column short, without lateral appendages. Anther at the back of the column, persistent,

stipitate. Pollen-masses 2, narrow, pyriform, powdery, fixed to the 2-fid rostellum above the stigma.

A considerable genus, found in various parts of the world.

1. **S. australis**, Lindl.;—*S. novæ-Zelandiæ*, Hook. Fl. N. Z. i. 242. A span high and upwards. Leaves 2 in. long, linear-lanceolate, acuminate, narrowed into long petioles. Scape covered with loosely sheathing bracts. Spike spiral, 1-2 in. long. Flowers  $\frac{1}{2}$ – $\frac{1}{3}$  in. long, white; bracts ovate, acuminate, as long as the flowers. Sepals and petals narrow, ovate-oblong, obtuse. Lip oblong, disk thickened; margins crumpled and waved. Ovary glandular-pubescent.

**Northern Island, Colenso.** The lip is very variable in form, narrower in the New Zealand than Australian specimens. A very common Australian plant, also found in China, India, and Siberia, and perhaps not different from a European species. The lip of the New Zealand plant indeed quite agrees with that of the European *S. æstivalis*.

## 17. PRASOPHYLLUM, Br.

Terrestrial, glabrous herbs; roots of round tubers often coated with matted fibres. Stem with a membranous sheath below the leaf. Leaf solitary, radical, linear, fistular, rarely short or 0. Flowers small, spiked, with the lip above.—Sepals oblong or ovate, lateral free or combined, recurved. Petals nearly as large as sepals, unequal-sided. Lip superior, clawed, ascending, undivided, often with an adnate plate on the disk. Column erect, small, with lateral appendages (staminodia). Anther at the back of the column, persistent, obtuse or with a long mucro. Pollen-masses 2, powdery, fixed to the rostellum above the stigma.

A large Australian and Tasmanian genus, more rare in New Zealand. I have very insufficient specimens of all the species except *P. Colensoi*.

Leaf sheathing the scape halfway up. Perianth  $\frac{1}{4}$  in. . . . . 1. *P. Colensoi*.

Leaf sheathing the scape to the top; blade very short or 0.

Perianth pointing forwards . . . . . 2. *P. nudum*.

Perianth pointing downwards . . . . . 3. *P. punitum*.

1. **P. Colensoi**, Hook. f. Fl. N. Z. i. 241. Stout, erect, 4-10 in. high. Leaf exceeding the spike, its sheath seldom rising more than halfway up the scape. Spike 1-3 in. long, many-flowered; bract small, obtuse. Perianth horizontal, greenish yellow,  $\frac{1}{4}$  in. diam., sweet-scented. Sepals ovate-oblong, acuminate, lateral free. Petals linear-oblong. Lip trowel-shaped, claw short, blade fleshy, subacute, thickened towards the tip. Column extremely short; staminodia broadly notched. Ovary obovoid, tumid.—Fl. Tasman. ii. 12. t. 112 A.

**Northern and Middle Islands:** abundant from Auckland southwards to Otago. I suspect that this is a variety of the sweet-scented Tasmanian *P. alpinum*, but the lip is shorter, more coriaceous, and thicker towards the tip.

2. **P. nudum**, Hook. f.;—*P. tunicatum*, Fl. N. Z. i. 242. Very slender, 8 in. high. Stem and leaf coated below with a fibrous lacerated sheath. Scape included throughout its length in the slender leaf-sheath. Blade of leaf very short,  $\frac{1}{2}$  in. long. Spikes  $\frac{3}{4}$ –1 in. long; bracts minute, obtuse. Perianth horizontal, yellowish,  $\frac{1}{2}$  in. long. Lateral sepals free, ovate-lanceolate, acuminate. Petals much smaller, same shape. Lip ovate-

lanceolate, with a flat, glandular, adnate plate; claw long. Column short; lateral lobes broad, acuminate, deeply 2- or 3-toothed. Anther apiculate. Ovary linear.

**Northern Island:** east coast, clay hills, Te Hawara, Port Nicholson, and Lake Taupo, *Colenso*. I have only three specimens. This entirely agrees with my Hobarton (Tasmanian) specimens described in 'Flora Tasmaniae,' ii. 13, as *P. nudiscapum*, to which the name *nudum* should be transferred. The *P. nudum* of the same work (p. 14), differs according to Archer's specimens only in the rather longer teeth of the appendages of the column; but according to his figure (t. 113 C) in the more oblong, shorter, obtuse lip, with ciliate edges.

3. *P. pumilum*, *Hook. f. Fl. N. Z. i. 242*. Habit and leaf of *P. nudum*, but perianth bent downwards. Lateral sepals ovate, acuminate. Petals similar but smaller. Lip trowel-shaped, subacute, with a broad, glandular, adnate plate; claw rather long. Column short; its lateral lobes large, broad, obliquely truncate and toothed. Anther apiculate.

**Northern Island, Edgerley; Auckland, Sinclair.** Very similar to the Tasmanian *P. despectans*, H. f., if not a variety of it; but the perianth is shorter, its segments broader in proportion, and the lateral lobes of the column shorter.

#### 18. ORTHOCERAS, Br.

Erect, glabrous, leafy, terrestrial herbs. Root of oblong tubers. Leaves narrow, filiform. Flowers rather large, racemed. Perianth closed.—Upper sepal suberect, hooded, fleshy, obtuse; lateral much longer, very narrow, almost filiform, quite erect. Petals minute, linear, 2-toothed at the tip. Lip inferior, small, 3-lobed, with small glands at its base, very shortly clawed. Column very short; lateral lobes subulate. Anther large, erect, persistent. Pollen-mosses 2, powdery, attached to the rostellum above the stigma.

A genus of an Australian and a New Zealand species.

1. *O. Solandri*, *Lindl.;—Fl. N. Z. i. 243*. Stout, erect, 1–2 ft. high. Leaves filiform, with long sheathing bases, rarely linear. Raceme 1–6 in. long, many-flowered; bracts large, spathaceous, exceeding the ovary. Perianth  $\frac{1}{2}$  in. long, greenish-yellow. Lateral sepals  $\frac{1}{2}$  in. long.—*O. strictum*, A. Cunn. not Br.; *Diuris novæ-Zelandiæ*, A. Rich. Flor. 163. t. 25. f. 1.

**Northern Island:** abundant on clay-hills, etc., *Banks and Solander*, etc. **Middle Island:** Nelson, ascending to 4000 ft., *Bidwill*. Very near indeed to the Australian *O. strictum*.

#### ADDITIONS, CORRECTIONS, ETC.

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262. *Earina mucronata*.—Chatham Island, *W. Travers*.

267. *Caladenia?* *bifolia*.—Referred to *Chiloglottis* (as *C. Traversii*) by Mueller in his 'Chatham Island Florula,' and with much reason; it differs slightly from that genus in the slender habit, less arched upper sepal, almost sessile lip, and small glands. It is certainly much nearer *Chiloglottis* than *Caladenia*, and on a revision of the former genus its character should probably be modified so as to admit it.

**Chatham Island, W. Travers.**

268. *Pterostylis Banksii*.—Chatham Island,  $\alpha$  and  $\beta$ , *W. Travers*.

## TAB. 7630.

## CALADENIA CARNEA.

VAR. *alba*.

*Native of E. Australia and Tasmania.*

Nat. Ord. ORCHIDÆ.—Tribe NEOTTIÆ.

Genus CALADENIA, *R. Br.*; (*Benth. & Hook. f. Gen. Plant.* vol. iii. p. 612.)

CALADENIA (*Eucaladenia*) *carnea*; gracilis, sparse pilosa, tuberibus globosis, folio elongato anguste lineari, floribus 1-3, sepalis petalisque lateralibus consimilibus pollicaribus lanceolatis subacutis, sepalo dorsali erecto lineari-oblongo lateralibus deflexis paullo brevioribus, petalis deflexis, labello parvo sepalis vix dimidio brevioribus, lobis lateralibus latis apice rotundatis glabris, terminali parvo ovato obtuso recurvo callis clavellatis marginato, disco inter lobos laterales callis globosis sessilibus v. stipitatis bi-multi-seriatis ornato, columna alata, anthera rostrata, pollinibus late obcordatis bilamellosis.

*C. carnea*, *R. Br. Prodr.* p. 324. *Lindl. Gen. & Sp. Orchid.* p. 417. *Endl. Iconogr.* t. 57. *Hook. f. Fl. Tasman.* vol. ii. p. 29, t. 124 A. *Reichb. f. Beitr. Orch.* p. 28. *Benth. Fl. Austral.* vol. vi. p. 386. *Fitzgerald, Austral. Orchid.* vol. i. *Synops.* p. 1. *IC. Caladen.* t. 4.

*C. alata*, *R. Br. l. c.* *Lindl. l. c.* 418. *Hook. f. l. c.* p. 30, t. 125 A. *Reichb. f. l. c.* 29.

*C. angustata*, *Hook. f. l. c.* t. 125 B.

*PArethusa catenata*, *Sm. Exot. Bot.* vol. ii. p. 29, t. 104.

*Var. alba*; sepalo dorsali columnaque virescentibus, sepalis lateralibus petalisque albis roseo viridique irroratis. *C. alba*, *R. Br. l. c.* p. 323. *Fitzgerald, l. c.*

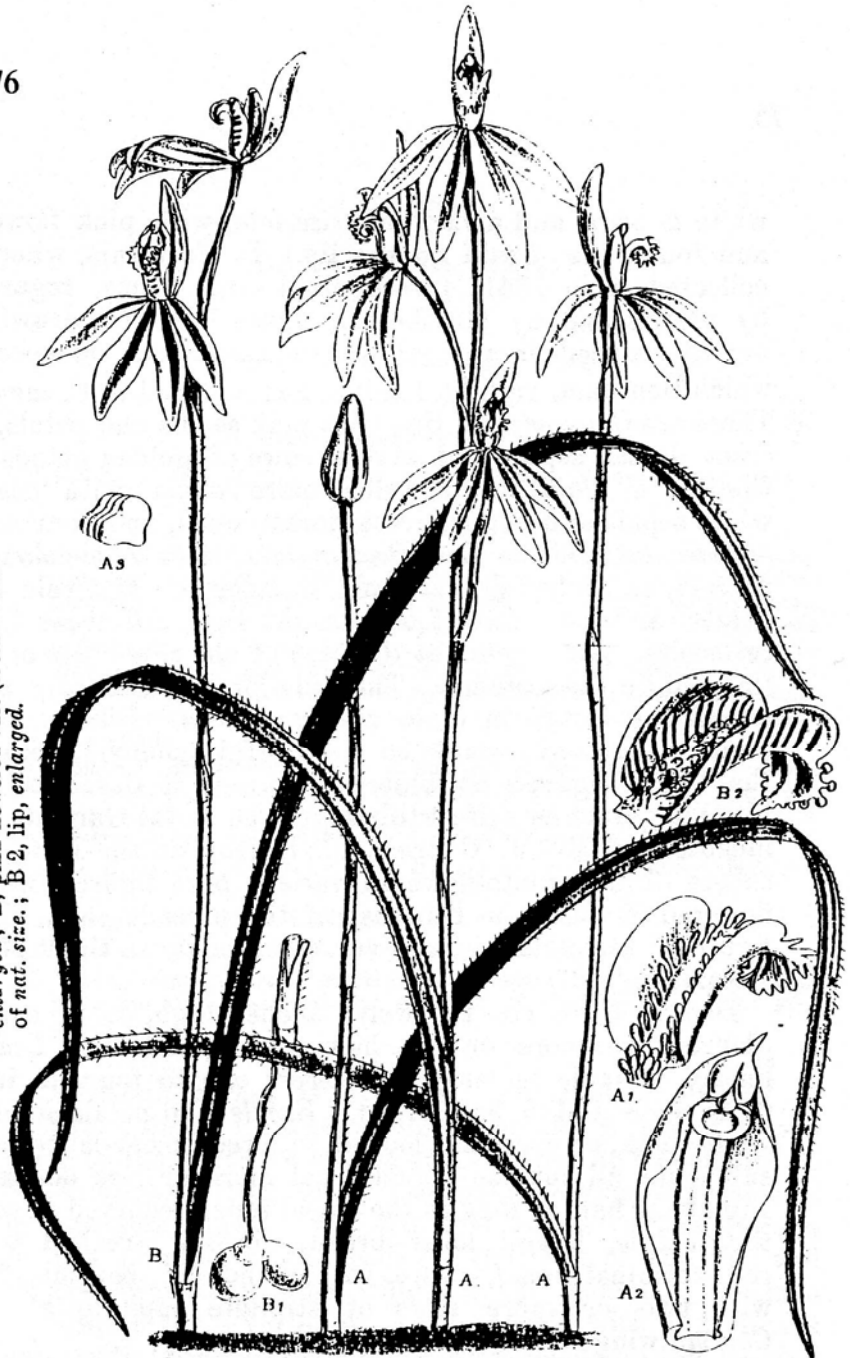
*Caladenia carnea* is a widely distributed species in Australia from Rockhampton, under the tropic of Capricorn, to the southern shores of Tasmania, and westward to St. Vincent Gulf in South Australia, varying a great deal in hairiness, and in the size and colour of the flowers, in the number of the calli on the disk of the lip, and in the breadth of the wings of the column. Bentham recognized three varieties; a typical one with pink sepals and petals, transverse bars of rose colour on the lip and column, and two rows of calli on the lip; a var. *alba*, with



white flowers, and a var. *quadriseriata*, with pink flowers, and four rows of calli on the lip. In Tasmania, where I collected it in 1841, I recognized three forms, regarded by myself and by Mr. Archer, whose beautiful drawings are reproduced in the "Flora of Tasmania," as species, which Bentham, rightly, I think, has reduced to *C. carnea*. These are *C. carnea*, R. Br., with pink sepals and petals, an erect dorsal sepal, and several rows of golden glands on the lip; *C. alata*, R. Br., taller, more robust, with nearly white sepals and petals, erect dorsal sepal, and four rows of pink calli on the lip; *C. angustata*, with rose-coloured flowers, an arched dorsal sepal, broader lateral sepals and petals, and four rows of calli on the lip. All these have transverse bars of pink at the base of the side-lobes of the lip, and on the column. The side-lobes are hardly produced into lobes in *alata* and *angustata*. I have cited Smith's *Arethusa catenata* as a doubtful synonym, because the lip is figured as blue. *C. carnea* is described by Mr. Fitzgerald as self-fertilizing. The Royal Gardens are indebted to Mr. J. O'Brien, of Harrow-on-the-Hill, for tubers of the white-flowered variety here figured, which flowered in a stove in February of the present year. The figure of the pink-flowered var. is taken from the "Flora Tasmaniae."

*Descr.*—*Stem* six to twelve inches high, from nearly glabrous to more or less hairy and glandular. *Leaves* linear, variable in length. *Flowers* one to four, an inch to an inch and a half broad. *Sepals* and petals similar, white, pink, or greenish clouded with red, linear-lanceolate, sub-acute, all but the dorsal sepal more or less deflexed. *Lip* about half as long as the dorsal sepal, recurved beyond the middle, lateral lobes broad, obtuse, streaked with red, terminal small, ovate, with glandular margins, disk with two or more rows of stipitate capitate glands. *Column* winged.—*J. D. H.*

Fig. A, White-flowered var.; A 1, lip; A 2, column; A 3, pollinia:—All enlarged; B, pink-flowered var. (from "Flora Tasmaniae," t. 124); B 1, roots, of nat. size; B 2, lip, enlarged.



M.S. del. J.N. Fitch. del.

Vincent Brookes, Day & Co. Lith. Imp.

L. Reeve & Co. London

## PLATE 1120.

CORYSANTHES CHEESEMANI, *Hook. f.*

## ORCHIDÆ.

**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 utriusque in auriculam deflexam obtusam productis.

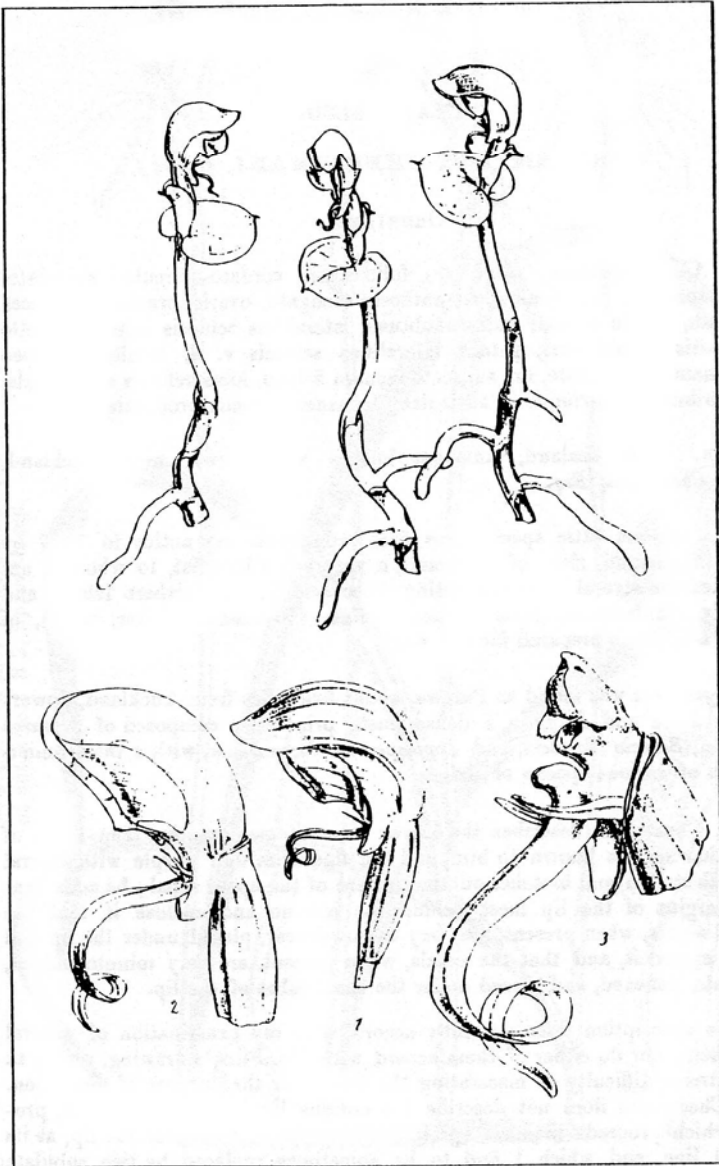
HAB. New Zealand, amongst bushes at Purewa, near Auckland, *F. F. Cheeseman, Esq.*

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.

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



W. H. Fitch del et lith.

J. H. Fitch imp.

*Corysanthes Cheesemani* Hk f

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.

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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 a 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.

A specimen of *C. (Nemetoceras) macrantha*, Hk. f. (Fl. N. Zeald. 1. 249, t. LVII.; Handbook, p. 266), sent by Mr. Cheeseman with the above, shows that the petals are inserted at the base of the lip at its outer margin, one on each side, apparently on a level with the lateral sepals, which are placed between the petals, that is to say, nearer to the mesial line of the lip. The lip is twisted from the base, so that access to the pollen and stigma is gained from the base of the flower, not as in *Corysanthes Cheesemani*, by the mouth of the lip. If this arrangement is constant, and prevails through the other plants upon which I established the genus *Nemetoceras*, in the New Zealand Flora, it may indicate the propriety of retaining that genus instead of merging it in *Corysanthes*, as I have done in the 'Handbook of The New Zealand Flora.' The whole genus demands an attentive study from the local observer, in respect both of structure and mode of impregnation.

—J. D. HOOKER.

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## TAB. 7630.

## CALADENIA CARNEA.

VAR. *alba*.

Native of E. Australia and Tasmania.

Nat. Ord. ORCHIDEE.—Tribe NEOTTIEÆ.

Genus CALADENIA, R. Br.; (Benth. &amp; Hook. f. Gen. Plant. vol. iii. p. 612.)

CALADENIA (Eucaladenia) *carnea*; gracilis, sparse pilosa, tuberibus globosis, folio elongato anguste lineari, floribus 1-3, sepalis petalisque lateralibus consimilibus pollicaribus lanceolatis subacutis, sepalo dorsali erecto lineari-oblongo lateralibus deflexis paullo brevioribus, petalis deflexis, labello parvo sepalis vix dimidio brevioribus, lobis lateralibus latis apice rotundatis glabris, terminali parvo ovato obtuso recurvo callis clavellatis marginato, disco inter lobos laterales callis globosis sessilibus v. stipitatis bi-multi-seriatis ornato, columna alata, anthera rostrata, pollinibus late obcordatis bilamellosis.

C. *carnea*, R. Br. Prodr. p. 324. Lindl. Gen. & Sp. Orchid. p. 417. Endl. Iconogr. t. 57. Hook. f. Fl. Tasman. vol. ii. p. 29 (t. 124 A) Reichb. f. Beitr. Orch. p. 28. Benth. Fl. Austral. vol. vi. p. 386. Fitzgerald, Austral. Orchid. vol. i. Synops. p. 1. Ic. Caladen. (t. 4.)

C. *alata*, R. Br. l. c. Lindl. l. c. 418. Hook. f. l. c. p. 30, t. 125 A. Reichb. f. l. c. 29.

C. *angustata*, Hook. f. l. c. t. 125 B.

♀ *Arethusa catenata*, Sm. Exot. Bot. vol. ii. p. 29, t. 104.

Var. *alba*; sepalo dorsali columnaque virescentibus, sepalis lateralibus petalisque albis roseo viridique irroratis. C. *alba*, Br. l. c. p. 323. Fitzgerald, l. c.

*Caladenia carnea* is a widely distributed species in Australia from Rockhampton, under the tropic of Capricorn, to the southern shores of Tasmania, and westward to St. Vincent Gulf in South Australia, varying a great deal in hairiness, and in the size and colour of the flowers, in the number of the calli on the disk of the lip, and in the breadth of the wings of the column. Bentham recognized three varieties; a typical one with pink sepals and petals, transverse bars of rose colour on the lip and column, and two rows of calli on the lip; a var. *alba*, with white flowers, and a var. *quadriseriata*, with pink flowers,



MS det J N Pittendrigh

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and four rows of calli on the lip. In Tasmania, where I collected it in 1841, I recognized three forms, regarded by myself and by Mr. Archer, whose beautiful drawings are reproduced in the "Flora of Tasmania," as species, which Bentham, rightly, I think, has reduced to *C. carnea*. These are *C. carnea*, R. Br., with pink sepals and petals, an erect dorsal sepal, and several rows of golden glands on the lip; *C. alata*, R. Br., taller, more robust, with nearly white sepals and petals, erect dorsal sepal, and four rows of pink calli on the lip; *C. angustata*, with rose-coloured flowers, an arched dorsal sepal, broader lateral sepals and petals, and four rows of calli on the lip. All these have transverse bars of pink at the base of the side-lobes of the lip, and on the column. The side-lobes are hardly produced into lobes in *alata* and *angustata*. I have cited Smith's *Arethusa catenata* as a doubtful synonym, because the lip is figured as blue. *C. carnea* is described by Mr. Fitzgerald as self-fertilizing. The Royal Gardens are indebted to Mr. J. O'Brien, of Harrow-on-the-Hill, for tubers of the white-flowered variety here figured, which flowered in a stove in February of the present year. The figure of the pink-flowered var. is taken from the "Flora Tasmaniae."

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Fig. A, White-flowered var.; A 1, lip; A 2, column; A 3, pollinia:—*All enlarged*; B, pink-flowered var. (from "Flora Tasmaniae," t. 124); B 1, roots, of nat. size.; B 2, lip, *enlarged*.

## The publications of W.J and J.D.Hooker on the New Zealand orchids

(Page and illustration numbers refer to the original work)

*Pterostylis nutans*. Nodding-flowered *Pterostylis*. Hooker W.J. Curtis's *Botanical Magazine* 1831. 58: t3085. *Illustration by W.J.Hooker.*

*Pterostylis banksii*. Large-leaved *Pterostylis*. Hooker W.J. and Cunningham A. Curtis's *Botanical Magazine* 1832. 59: t3172. *Illustration by Franz Bauer.*

*Microtis parviflora*. Small-flowered *Microtis*. Hooker W.J. Curtis's *Botanical Magazine* 1835. 62: 3377. *Illustration by W.H.Fitch.*

*Icones Plantarum, or Figures, with Descriptive Characters and Remarks, of New and Rare Plants selected from the Kew Herbarium.* Hooker W.J. *Illustration by W.H.Fitch.*

*Earina mucronata* 1844. Vol I (Vol V of the entire work)  
t431

*The Botany of the Antarctic Voyage. Vol 1: Flora Antarctica. Part 1: Botany of Lord Auckland's Group and Campbell's Island.* Hooker J.D. London, Reeve, 1844.

*Acianthus (Corybas) rivularis (?acuminatus)* p71

*Caladenia* sps.

*Chiloglottis cornuta* p69

*Thelymitra stenopetala (longifolia)* p69

*Thelymitra uniflora (cyanea)* p70

*Dubii generis* p 71

*Flora Antarctica Part 2.* Hooker J.D. London, Reeve, 1847.

*Thelymitra unifolia (cyanea)*  
*Lyperanthus antarcticus* p544

*Flora Novae Zelandiae Part 1.* Hooker J.D. London, 1853. *Illustrations*  
 by W.H.Fitch.

*Acianthus sinclairii* p245  
*Adenochilus gracilis* p246 t56A  
*Bulbophyllum pygmaeum* p240  
*Caladenia (Aporostylis) bifolia* p247  
*Caladenia lyallii* p247  
*Caladenia minor* p247 t56B  
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*Cyrtostylis oblonga* p246  
*Cyrtostylis rotundifolia (reniformis)* p246  
*Dendrobium cunninghamii* p240  
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*Earina mucronata* p239  
*Gastrodia cunninghamii* p251  
*Gastrodia sesamoides* p251  
*Microtis porrifolia (unifolia)* p245  
*Nematoceras (Corybas) macrantha* p250 t57A  
*Nematoceras (Corybas) oblonga* p250 t57B  
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*Orthoceras solandri (strictum)* p243  
*Prasophyllum colensoi* p241  
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*Prasophyllum pumilum* p242  
*Prasophyllum tunicatum (nudum)* p242  
*Pterostylis australis* p248  
*Pterostylis banksii* p248  
*Pterostylis foliata* p249  
*Pterostylis graminea* p248  
*Pterostylis micromega* p248  
*Pterostylis puberula (nana)* p249  
*Pterostylis squamata (plumosa)* p249  
*Pterostylis trullifolia* p249  
*Sarcochilus (Drymoanthus) adversus* p241  
*Spiranthes novae-zelandiae (sinensis)* p243  
*Thelymitra uniflora (cyanea)* p244  
*Thelymitra forsteri (longifolia)* p243  
*Thelymitra imberbis (carnea)* p244

*Thelymitra pauciflora* p244  
*Thelymitra pulchella* p244

*Flora Tasmaniae Part 2.* Hooker J.D. London, 1860. *Drawings by W.Archer and lithography by W.H.Fitch.*

*Acianthus viridis* p372  
*Caladenia alata* p30 t125A  
*Caladenia camea* p29 t124A  
*Calochilus campestris* p15 t116A  
*Chiloglottis gunnii* p23 t108B  
*Cryptostylis longifolia (subulata)* p9 t108A  
*Cyrtostylis reniformis* p26 t119C  
*Gastrodia sesamoides* p31 t124  
*Microtis parviflora* p25  
*Prasophyllum alpinum* p12 t112A  
*Prasophyllum nudiscapum* p13  
*Prasophyllum nudum* p14 t113C  
*Prasophyllum patens* p11 t111  
*Pterostylis furcata* p20  
*Pterostylis mutica* p21 t117A  
*Pterostylis nana* p19 t114B  
*Pterostylis nutans* p18  
*Pterostylis squamata* p20 t116A  
*Thelymitra camea* p5 t102B  
*Thelymitra ixiodides* p6 t103B  
*Thelymitra nuda* p5 t103A  
*Thelymitra venosa* p4 t102A

*Handbook of the New Zealand Flora.* Hooker J.D. London, 1864.

*Acianthus sinclairii* p264  
*Adenochilus gracilis* p265  
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*Thelymitra pulchella* p271  
*Thelymitra unifolia (cyanea)* p271

*Icones Plantarum, or Figures, with Descriptive Characters and Remarks,  
 of New and Rare Plants selected from the Kew Herbarium.* Hooker  
 J.D. Illustration by W.H.Fitch.

*Corysanthes (Corybas) cheesemanii* 1881?. Vol II (Vol XII of  
 the entire work) pp19-20, t1120. 1882. Vol III (Vol  
 XIII of the entire work) p2

*Corysanthes (Corybas) macrantha* 1882. Vol III (Vol XIII of  
 the entire work) p2

*Caladenia carnea* var *alba*. Hooker J.D. Curtis's *Botanical Magazine*  
 1898. 54: t7630. Drawing by M.Smith and lithography by J.N.Fitch.

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## The Hookers' artists

W.J.Hooker was himself an accomplished botanical artist, and he drew many of the illustrations for Curtis's *Botanical Magazine* (including *Pterostylis nutans* reproduced here) from 1826 to 1832 after which W.H.Fitch began to assist with the work.

### Franz Andreas Bauer 1758-1840

This was the greatest botanical artist of all. Bauer was born in Austria; his father was painter to Prince Liechtenstein, but he died when Franz was an infant. The last was talented even in childhood, and a painting was published when he was thirteen. After his brother Ferdinand, he came to England at age thirty, where he was within a short time attached to Sir Joseph Banks at Kew, and painted plants. His name was anglicised to Francis.

George III's explorers were sending back new plants from all over the world, and the sheer volume of work encouraged an excellence that has been recognised as the golden age of botanical art. Some of Bauer's paintings of plants now form part of the Banksian collection in the British Museum: among them are 127 of British orchids.

His Kew drawings were published in 1796 in W.T.Aiton's *Delineations of Exotick Plants cultivated in the Royal Garden at Kew*. The Directors of the East India and Sierra Leone Companies had sent specimens. It was later said of Bauer's drawings, that "In the delineation of plants he united the accuracy of a profound Naturalist with the skill of the accomplished artist".<sup>16</sup>

For sheer virtuosity, Bauer's paintings are unparalleled; he drew complex plants with apparent ease, and his attention to botanical detail is remarkable. He became an accomplished botanist, and was skilled with the microscope: when Banks was studying blight, Bauer made detailed drawings of microscopic specimens; he published some work in the popular press on the smut of wheat, and eventually read a paper to the Linnaean Society on the Ergot of Rye.

Bauer illustrated Lindley's *Illustrations of orchidaceous plants*, published in 1830-38; his work on the structure of orchids is of great importance.

Banks remembered him in his will, with an annuity of three hundred pounds, "on condition that he continues to reside on Kew

Green, and employs himself in making drawings of plants that flower in the collection at Kew, in the same manner as he has hitherto done".<sup>17</sup> He lived and died at Kew, painting flowers to the end at age 82, "admired, loved and respected" according to his epitaph at Kew church.

Curtis's *Botanical Magazine* contains two Bauer paintings of New Zealand orchids. The onion orchid *Microtis parviflora* appeared in 1835, No. 3377. The specimen was an Australian one, sent by the great Kew plant collector Richard Cunningham in 1824,

"with others of the very curious Orchideae of New South Wales to His Majesty's Garden at Kew, where it flowered in October, 1828, when the drawing, which Mr. Bauer has obligingly communicated to us, was made. In September of the present year the same plant flowered in the greenhouse of the Glasgow Botanic Garden, among a box of rare Orchideae sent by Mr Richard Cunningham from the same country, the preceding year".<sup>18</sup>

W.J.Hooker's careful prose barely hides the excitement they must have felt to see the new plant flowering from across the world.

In 1826 Allan Cunningham found plants of the greenhood *Pterostylis banksii* on the bank of a stream in the Bay of Islands; they were aver 30cm high. He took some to Sydney, and later sent them to Kew by which time they had died back to tubers and were presumed dead. But the next season everybody was delighted to see a perfect specimen emerge, flower, and be painted by Francis Bauer. His painting appeared in Curtis's *Botanical Magazine* of 1832, No.3172.<sup>19</sup>

Francis Bauer's brother Ferdinand Lukas Bauer was the natural history painter who accompanied the great botanist Robert Brown on a voyage of exploration to Australia on the *Investigator*, under Captain Flinders.

## Walter Hood Fitch 1817-1892

For sheer volume of output W.H.Fitch must be regarded as the most prolific of all botanical artists: he published at least 9600 drawings, the majority in colour.

He was discovered by William J.Hooker, then Professor of Botany in Glasgow, and when the latter took over as Director of Kew Gardens, Fitch became sole illustrator of Curtis's *Botanical Magazine*, and remained so for forty-three years. He was a lithographer as well as an artist, and would often draw directly onto the stone.

J.D.Hooker wrote of the "...unrivalled skill in seizing the natural characters of plants" of this "incomparable botanical artist". He must

have been fast: he would draw standing, a stone block in one hand and a pencil in the other, the bold freehand lines laid on with an unerring sweep of the pencil. In the *Icones plantarum* is an illustration of peka-waka, the spring flowering *Earina mucronata* drawn by W.H.Fitch.

Fitch wrote a series of articles about botanical drawing for the *Gardeners' Chronicle*. His prose is as overdecorated as midvictorian furniture, but he admitted he was no writer - "I am more accustomed to the pencil than the pen".<sup>20</sup>

He wrote this about the differences between scientific botanical drawing, and flower painting,

"I may have occasion hereafter to say something about colouring - botanical and fanciful, for there is a difference between the two - similar to that between a portrait and a mere picture. A strictly botanical drawing generally represents but one or two individual plants, and they must be equally correctly drawn and coloured. A fancy drawing or group in proportion to the number of plants introduced may have the details judiciously slurred over, for the eye of the observer cannot comprehend the minute points of all at a glance, so there is no labour lost. I may state that this dependance on the carelessness of the observer is very frequently carried too far - and if at all times far from flattering, is often offensive; and that the works of many professors of flower drawing are not calculated to improve the public taste for the domain of Flora."

When he gets down to the practicalities of drawing, though, the prose is clear enough, and the advice is excellent: treat the leaves as if they were skeletonised; place the flower correctly on its stalk; sketch the lower leaves first if they are erect and elongated, the upper if the leaves hang down; the stem is never straight so a ruler should never be used; if hairs are represented at all they should be done correctly.

His great achievement was what he could do from dried herbarium specimens. Somehow he was able to recreate the plant in its original freshness: "Indeed, one of the finest exercises ... with which I am acquainted, is the analysis of a dried flower, from an herbarium specimen, perhaps very small, worm-eaten and gluey, and having no apparent analogy to any known plant".

He left Kew after an argument about money, and shortly afterward his health began to fail. He died of a stroke in 1892, and the *Gardeners' chronicle* said in its obituary,

"As a botanical artist Fitch had no rival for grace and fidelity to Nature. His vast experience gave him a power of perception and insight such as few, if any, artists have possessed in greater, if equal degree".<sup>21</sup>



Walter Hood Fitch was artist for New Zealand's first illustrated Flora, the second volume of J.D.Hooker's *The Botany of Ross's Antarctic Voyage* (1844-60). He had already done the drawings and engravings for the first, *Flora Antarctica*. Among the engravings in the second volume (*Flora Novae Zelandiae*) are those of *Corybas macranthus* and *Corybas oblongus*, *Adenochilus gracilis*, and *Caladenia catenata*. Coloured and uncoloured versions of the work were printed.<sup>22</sup> In the third volume (*Flora Tasmaniae* - drawings by W.Archer) there are impressions of many orchids of interest in New Zealand - *Caladenia alata*, *C. carnea*, *Calochilus campestris*, *Chiloglottis gunnii*, *Cryptostylis subulata*, *Cyrtostylis reniformis*, *Gastrodia sesamoides*, *Prasophyllum alpinum*, *P. nudum*, *P. patens*, *Pterostylis mutica*, *P. nana*, *P. squamata*, *Thelymitra carnea*, *T. ixioides*, *T. nuda* and *T. venosa*.

Matilda Smith 1854-1926  
John Nugent Fitch 1843-1927

Brief biographical notes on Matilda Smith and J.N.Fitch have been recorded in *Cheeseman on orchids*, No.4 of the New Zealand Native Orchid Group's *Historical Series* (p108).

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