

when we consider that they sometimes appear (the third especially) as *bright* spots when entering upon his surface in transit, as I have myself observed; but this is only for a short distance within the limb. As they advance upon the face of the planet they become *dark* by contrast—sometimes as black as their shadows. This is accounted for by the vast difference of brightness between the centre and the edge of the planet's disc. This last is, I think, compatible with the supposition of a *glowing ball*, whose surface lies far within the confines of the vaporous envelope, which alone is visible to us. As to the satellites, we cannot argue anything definitely or positively from them with regard to the question under discussion, as we know next to nothing of their physical condition; their *variable brightness*, if nothing else, compels us to rank them among the many unsolved mysteries of astronomy.

The subject deserves, and I trust will receive, more precise and thorough investigation.

TASMANIAN MOSSES.

By R. A. BASTOW, F.L.S.

The illustrated key, accompanying this paper, is prepared chiefly for the use of students, residing in our country districts, who have not at all times access to the many valuable Botanical works in the Royal Society's Library.

The illustrations are, for the most part, drawn from nature; or, where specimens of the mosses have not been available, the drawings have been taken from standard works on the subject, namely:—"Flora of Tasmania," "Flora of New Zealand," and "Flora of the Antarctic Islands," by Dr. J. D. Hooker, F.R.S.; "Bryologia Britannica," by William Wilson, Esq.; and "Musci Exotici," by William Jackson Hooker, F.R.A. & L.S., and in the accompanying description of species the following works have also been freely used:—"Bridel, Bryologia Universa;" "Hooker's Handbook of the New Zealand Flora;" "Fragmenta Phytographiæ Australiæ," by Baron von Mueller; "Musci Austro-Americani," by Mitten; "Australian Mosses," by Baron von Mueller; "Mitten's Catalogue of Australian Mosses;" and MSS. from Mr. H. Boswell, of Oxford.

The genera are all arranged on one large sheet so that the whole may be presented at one view. The drawings on the upper half of the sheet are so placed that

the particular generic points may be presented to the eye; so as to make the meaning of the botanical terms more clear, a very simple sketch very often succeeding in conveying an idea better than much verbiage. The drawings on the lower half of the sheet are illustrations of distinct species in the genera immediately under whose names they stand; the key is thus made to impart some idea of at least one species of each genus, and these amount to over a fourth part of all the species of mosses in Tasmania. It may also be observed that such species, as are represented, are drawn first to their natural size, and, immediately below, as they appear under an $1\frac{1}{2}$ "Objective"—the small space between the natural-sized drawing and the magnification being filled in with such details as tips of leaves, forms of teeth, &c., peculiar to the species, the name of which is printed immediately underneath.

Having before us a very small moss plant, perhaps, if we essay to identify this, we shall obtain a more certain idea of the manner of using the key. The plant was collected by Mr. R. G. McLeod, near to Evandale. It is indeed a gem, although altogether only about three-eighths of an inch in length. The leaves appear rather larger than is usual in such plants, the fruitstalk is most gracefully curved and is apparently a prolongation of the stem. Let us endeavour to find out to which of the numerous genera in the key this plant is to be assigned:—

1st. We find at the top of the key all the mosses of Tasmania are divided into two sections—these are, terminal fruiting or acrocarpous mosses, and side-fruiting or pleurocarpous mosses. As we observe the plant before us we cannot have the least doubt as to which of these sections it does belong to: it is certainly terminal-fruiting, and consequently it must be assigned to some genus included in the long bracket containing Nos. 1 to 56 inclusive. Nos. 57 to 82 may therefore be lost sight of as far as regards the plant under consideration.

2nd. It will be observed that the long bracket which must include the genus we are seeking contains:—*a.* Mosses whose capsules are without lids. *b.* Mosses whose capsules are without peristome or teeth. *c.* Mosses with a peristome of one row of teeth only. *d.* Mosses with double rows of teeth. *e.* Mosses whose leaves are distichous, *i.e.*, inserted in two opposite rows, something after the manner of fern-fronds—To find out to which sub-section under the long bracket the little plant belongs is our next care. Its parts are too small for observation, with unaided vision; we therefore place it under the microscope, and with the aid of a pair of fine tweezers the calyptra or veil, which covers the capsule as with a helmet,

is removed. The lid must also be removed with a fine pointed knife or needle, and now a beautiful double peristome is in view. The plant therefore belongs to that division of mosses under the long bracket that has two rows of teeth, and must be looked for between the numbers 41 and 55 inclusive. The range is thus considerably narrowed.

3rd. But, again consulting the key, we find that the terminal fruiting mosses whose capsules have two rows of teeth, are again divided in two sections, namely, those with flat capsules, and those with terete or round capsules. The capsule on our plant is exactly round in section; we may therefore dismiss No. 41 from consideration, and confine our search for the genus amongst Nos. 42 to 55 inclusive—*i.e.*, to mosses whose fruit is terminal, with double peristome, and with terete or round capsules with short teeth, definite in number.

4th. But by the key we are informed that terminal fruiting mosses, with double peristomes and with terete capsules, may be again divided, by the form of the calyptra or veil, into those with mitriform calyptra, and those with cuculate or dimidiate calyptra. We have just previously noticed that the calyptra was shaped like a helmet; and if it is in that form, it is assuredly cuculate or dimidiate. We may therefore dismiss Nos. 42, 43, and 44 from notice, for the calyptra of those mosses is mitriform.

5th. We again observe by the key that the bracket containing terminal fruiting, double peristomed, terete capsuled, cuculate veiled mosses are again subject to five divisions, and these are all included in Nos. 45 to 55 inclusive. We will examine these divisions one by one:—Taking the largest division first, we find that the leaves in that division are various and the capsule cylindric. The capsule of our plant is not cylindric, it is pyriform. We consequently dismiss this division, containing Nos. 49 to 55, from further consideration, this small pyriform capsuled plant does not belong to those numbers. There are now only Nos. 45, 46, 47, and 48 to consider. No. 45, *Bartramia*, has a globose capsule; that is not the genus we require. No. 46 is *Zygodon*, with an ovoid capsule; we pass over that genus. No. 47 is *Codonoblepharum*, with erect capsule, and quite similar to *Zygodon*; this does not correspond with the capsule before us, and consequently we pass it by. No. 48 is the only genus left for consideration. The description reads—“*FUNARIA*, leaves flaccid, cells large, lax. Capsule pyriform, inclined or pendulous. Mouth small, teeth horizontal.” On examination of the plant under the microscope we find the generic description on the key faithfully describes the plant, and we have no hesitation in placing it amongst the *Funaria*.

6th. On examination of the drawing we observe that the plant we have been identifying is there represented just as it appears in its natural size, as it appears with a pocket lens, and as the capsule appears under the microscope; we may therefore not only come to the conclusion that the plant is a *Funaria*, but that it is also *Funaria crispula*.

A more minute description of the plant will be found by referring to the index at the end of the specific description.

There are many localities around this city (Hobart) where cryptogamic life abounds, and to a few of such haunts we will briefly allude. The summit of Mount Wellington is an interesting locality to the bryologist, almost every square yard of its rugged surface is garnished with moss, with lichen, or with hepatic; both *Andréæa acuminata* and *A. subulata* are abundant. In the crevices the graceful *Lepidozia pendulina*, and the rich *Jungermannia colorata*, are in rivalry; whilst *Leptostomum gracilis*, in the most genteel manner, tosses its nut-brown capsules in conscious superiority to both. The weather-worn depressions, forming pools on every side, contain *Sphagnum Australe* and *Dicranum Billardieri*; these are strangely altered by surrounding conditions from their normal growth, as they appear in the forests and bogs below. Colonies of *Polytrichum juniperinum* here attain magnificent condition, growing from three to six inches in height, perfectly erect, each plant tipped with a fawn-coloured woolly cap, much in the form of the head-dress which artists generally supply to Robinson Crusoe. The "Ploughed-fields" will amply repay the collector; it is probable that many species of Hepaticæ and mosses will here be found that do not flourish elsewhere. It is almost certain that *Racomitrium lanuginosum* (the wool-bearing moss with a torn calytra) will be obtained. The tips of the leaves of this superb moss are prolonged into thin hair-like points, giving to the whole plant the appearance of being covered with a thin coating of wool. The neighbourhood of the Springs is a perfect paradise of mosses. The beautiful *Hookeria amblyophylla* will here be found—a species of a magnificent genus, whose capsules are of perfect form, and whose leaves are always interesting objects for the microscope on account of their exquisite areolation. A moss of soft texture, yellowish green, and growing freely five or six inches high, may also be collected; it generally seeks the shelter of some rock; it is *Bartramia Halleriana*, and will no doubt puzzle young students not a little in their endeavours to identify it. The fruit appears to be lateral in consequence of the growth of the innovations or young shoots, which are usually solitary, but when examined at an early stage (in flower) they will be found to be truly terminal. The globose capsules of this plant are

beautifully furrowed; the whole genus is known in England as Apple moss, the capsules, although small, are round and plump—they are generally furrowed when dry. The fallen trunks of trees in this locality are covered with the club-bearing *Polyotus Magellanicus*, *Frullania proboscidiophora*, *Gottschea integrifolia* (probably a new species to science, found by Mr. Leonard Rodway), *Jungermannia cymbalifera*, *Frullania falciloba*, and other hepatics; mingled with these may be found, in patches, tufts of *Bryum bimum*, *Rhizogonium spiniforme*, *R. bifarium*, *R. sub-basilare*, and no doubt a number of other interesting plants as yet undetected.

The Silver Falls are a pleasant resort at all times, and a glimpse of the cryptogamic life around them will by no means detract from the pleasure of a visit. There is one particularly fine large moss growing there, and in many other localities about the mountain, which will certainly arrest the attention of all but the careless passer-by. I allude to *Hypnum* (*Ptychomnion*) *aciculare*; it much resembles thick green chenille chord, it is distantly branched, and the fruit-stalks shoot out most clearly from the side of the stem. Patches of hepatic, glistening like frosted silver, enrich the old trunks of forest sires as they lay here and there; these patches are composed of the curious sagey-green *Trichocolea tomentella*, the leaves are deeply cleft, so as to appear as small spikes, and are, when freshly gathered, covered with minute globules of moisture as though clothed with pearls, pearls of the purest water. The *Cyathophorum pennata* fringes the fallen tree-fern; in conjunction with *Hymenophyllum flabellatum* (a fern), it forms a royal valence to each water-worn recess, and immediately arrests the attention of the visitor to the Colony as a masterpiece, it must elicit admiration. If examined closely the fruit of the *Cyathophorum* will be found to spring from a tiny cup, hence its name; the fruit-stalk is very short, the capsules beautifully symmetrical. Here also will be found three or four species of *Hookeria*, *Rhizogoniums*, *Hypnums*. and *Macromitrium*s; amongst *Hepaticæ*, *Polyotus*, *Mastigobryum*, *Lepidozia*, *Symphyogyna*, and the degraded *Anthoceros*, with many others. The *Macromitrium serratum* gilds the branches of the trees on which it nestles; it is lovely on the tree, it is beautiful under the microscope, and as a dried specimen it still remains charming both in colour and form. The vasculum may soon be filled in this secluded spot. Here we found *Orthotrichum luteum*, on the trees; *Distichium capillaceum*, growing at the roots of trees; *Dicranum Billardieri*, *Bryum*, *bimum*, *Ceratodon purpureus*, *Hypnum* (*Thuidium*) *furfurosum*, *H. extenuatum*, three or four species of *Rhizogonium*, the lovely *Leptostomum Menziesii*, *Campylopus*, *Fissedens*; Hepatics of various genera, including *Marchantia polymorpha*,—the

latter easily known by its singular umbrella-like fruitstalks and expansive thallus; and others too numerous to mention.

In the fields adjoining Mr. King's land, off Cambridge-road, Kangaroo Point, *Phascum cylindricum* may be secured; also *Ceratodon*, *Campylopus*, *Funaria*, *Fissedens*, *Bartramia*, *Wiessia*, *Grimmia*, *Tortula*, *Splachnum*, *Bryum*, and several *Hypnum*s; amongst the latter, *H. fulvastrum* is one of the most beautiful: grows in patches about six inches in diameter, and is usually yellowish, changing to light green; it is an elegant pinnately branched moss, and makes exquisite dried specimens. At the summit of Mount Rumney the *Encalypta Australis* will be found, growing in rather distant small tufts: the singularly large extinguisher-shaped calyptra will at once enable the student to recognise it. Here also the interior angles of the rocks are made beautiful by patches of *Grimmia basaltica*, the bright red peristomes of this neat plant are sure to attract attention. I will only mention one other locality, but perhaps it is the most favourable and fairest collecting-ground near Hobart; at St. Crispin's Well, near the source of the Plains Rivulet, nearly every moss that has been previously mentioned may be collected, with the addition of many more exquisite species.

In the description of species the following mosses are added to those described in "Flora Tasmaniæ."

1. *Sphagnum Novo-Zealandicum*, Mitt. Cat.
2. *Phascum grandiglobum*, Lindbg. Mitt. Cat.
3. *Fissedens dealbatus*. Hook. h.b. N.Z. Fl.
4. ,, *asplenoides*. Hook. h.b. N.Z. Fl.
5. ,, *pungens*. Austr. Mosses. F. v. M.
6. *Blindia arcuata*. Mitt. Cat.
7. *Tortula Latrobeana*. Mitt. Cat.
8. ,, *atrovirens*. Mitt. Sth. American M.
9. ,, *Muelleri*. Hook. h.b. N.Z. Fl.
10. *Trichostomum setosum*. Boswell MSS.
11. *Leptangium tumidum*. Mitt. Cat.
12. *Grimmia basaltica*. Hook. h.b. N.Z. Fl.
13. *Racomitrium (Dryptodon) rupestre*. Hook. h.b. N.Z. Fl.
14. ,, ,, *chlorocarpon*. Mitt. Cat.
15. ,, *protensum*. Boswell MSS.
16. *Macromitrium longirostre*, var. B. Hook. h.b. N.Z. Fl.
17. ,, *asperulum*. Mitt. Cat.
18. ,, *Scottiæ*. Mitt. Cat.
19. *Leptostomum gracilis*. Hook. h.b. N.Z. Fl.
20. ,, *Menziesii*. Boswell MSS.
21. *Leptobryum sericeum*. Mitt. Cat.
22. *Orthodontium lanceolatum*. Mitt. Cat.

23. *Meilichoferia microdonta*. Mitt. Cat.
24. *Bryum campylothecium*. Hook. h.b. N.Z. Fl.
25. „ *chrysoneuron*. Mitt. Cat.
26. *Bartramia elongata*. Mitt. Cat.
27. „ *commutata*. Mitt. Cat.
28. *Funaria glabra*. Hook. h.b. N.Z. Fl.
29. „ *Tasmanica*. Austr. Mosses. F. v. M.
30. *Polytrichum (Pogonatum) tortile*. Hook. h.b. N.Z. Fl.
31. „ „ *Gulliveri*. Mitt. Cat.
32. *Cryphea parvula*. Hook. h.b. N.Z. Fl.
33. „ *crenulata*. Mitt. Cat.
34. *Isothecium fruticosum*. Mitt. Cat.
35. „ *augustatum*. Boswell MSS
36. *Hypnum fulvastrum*. Boswell MSS.
37. „ *amœnum*. Boswell MSS.
38. „ *vagum*. Mitt. Cat.
39. „ *oblongifolium*. Mitt. Cat.
40. *Rhizogonium aristatum*. Mitt. Cat.
41. „ *pellucidum*. Mitt. Cat.
42. *Hypopterygium glaucum*. Mitt. Cat.
43. *Hookeria denticulatum*. Mitt. Cat.

1. ANDREÆA, F. EHRHART.

Small, dark brown, growing on rocks. Key, No. 1. Named in honour of André, a Hanoverian naturalist.

1. *A. petrophila*, EHRH. Leaves nerveless, ovate-subulate, papillose. Wils. Bry. Brit. Key, No. 1. On sub-alpine mountains.
2. *A. montana*, MITT. Leaves ovate, slightly acuminate. On rocks, Cumming's Head.
3. *A. acuminata*, MITT. Leaves sheathing, ovate-lanceolate, lower margins minutely crenulate. On rocks, Mt. Wellington.
4. *A. nitida*, J. HOOK. AND WILS. Leaves nerveless, oblong-ovate, obtuse, shining. Western Mountains.
5. *A. subulata*, HARVEY. Leaves with broad nerve, ovate-subulate, falcate. Mt. Wellington.

2. SPHAGNUM, C. LINNÆUS.

The name is from Pliny; he used it to denote moss-like growths on trees. Key, No. 4. In bogs.

A. Branches with one or two cortical layers of cells.

1. *S. molliculum*, MITT. Leaves elliptic-oval, apex subtruncate, minutely denticulate. Cheshunt.
2. *S. cymbifolioides*, C. MUELL. Stem leaves oval; branch leaves truncate, toothed. Cheshunt.
3. *S. contortum*, WILS. Leaves ovate-lanceolate, acute, sub-coriaceous. Key, No. 4. In bogs, Mt. Wellington. Var. 2, *laxum*; var. 3, *scorpioides*; var. 4, *intermedium*.
4. *S. compactum*, BRIDEL. Leaves ovate-oblong; apex truncate, denticulate. In bogs, Huon River. Var. γ , Huon River.

B. Branches with three or more cortical layers of cells, without spiral fibres.

5. *S. cymbifolium*, DILL. Cells of branches with spiral fibres. Wils. Bry. Brit. In swamp, New Norfolk.
6. *S. australe*, MITT. Leaves of branches ovate, obtuse. Near Huon River.
7. *S. confertum*, MITT. Leaves of branches ovate; apex truncated, toothed. Near Cumming's Head.
8. *S. Novo-Zelandicum*, MITT. Habit compact of *S. cymbifolium*, cortical cells without spiral fibres; cauline leaves obovate-lingulate, obtuse, denticulate. Branch leaves ovate-acuminate. Mitt. Aust. Cat.

3. PHASCUM, LINNÆUS.

Minute mosses growing on earth, named in allusion to the bladdery appearance of the fruit. Key, No. 2.

1. *P. (Ephemerum) cristatum*, HOOK. AND WILS. Leaves lanceolate, deeply toothed; capsule immersed; calyptra campanulate. Cheshunt.
2. *P. (Astomum) cylindricum*, TAYLOR. Tufty; capsule elliptic, apiculate; fruitstalk short; operculum, persistent; calyptra cucullate or conico-campanulate. In fields, Kangaroo Point.
3. *P. (Acaulon) apiculatum*, HOOK. FILS. ET WILS. Bud-form. Leaves obovate, acuminate, concave, apiculate, the tip apparently secund. Cheshunt. Var. *turgidum* Cheshunt.
4. *P. (Pleuridium) gracilentum*, MITT. Stem, $\frac{1}{4}$ in. high. Upper leaves much attenuated. Fruitstalk short. Key, No. 2. West side of Tower Hill, Cheshunt.

5. *P. (Pleuridium) tenellum*, MITT. Pale brown, fragile texture. Capsule oval, shortly pedicellate, closely corresponding with *P. nitidum* (Wils. Brit. Bry.). Cheshunt.
6. *P. (Pleurophascum) grandiglobum*, LINDBG. Description not available.

4. BRUCHIA, S. E. BRIDEL.

A gemmiform plant, growing on clayey banks, named in honour of Bruch. Key, No. 3.

1. *B. minuta*, MITT. Leaves lanceolate, minutely serrulate above. Capsule entire, apophysate. Key, No. 3. Sides of ditches, Cheshunt.

5. GYMNSTOMUM, HEDWIG.

Usually growing on moist rock. Name, from γυμνος, naked, and στομα, mouth. Key, No. 13.

1. *G. calcareum*, NEES AND HORNSCH. Stem $\frac{1}{8}$ to $\frac{1}{4}$ in. high; leaves spreading, linear-lanceolate, margins flat. Key, No. 13. On rocks, North-West Bay.
2. *G. bicolor*, HAMPE. Leaves distant, recurved, linear, obtusely apiculate, papillose at the back, slightly denticulate at the apex. On the ground amongst lichens and other mosses.

6. WEISSIA, HEDWIG.

Named in honour of Weiss, a cryptogamic botanist, of Gottingen. Key, No. 25. In fields, on banks, and shady rocks.

1. *W. flavipes*, HOOK. f. AND WILS. Leaves narrow lanceolate, margin nearly flat. Teeth perforated. Key, No. 25. Gullies, Mt. Wellington, Kangaroo Point.
2. *W. contraversa*, HEDWIG. Leaves lanceolate, margin involute. Teeth nearly entire. Wils. Bry. Brit. Cheshunt. Kangaroo Point.
3. *W. microcarpa*, HOOK. f. AND WILS. Leaves carinate-concave. Teeth slightly divided at apex. Kangaroo Point.

7. SYMBLEPHARIS, CAMILLE MONTAGUE.

So named in allusion to the teeth of the peristome conniving. On trees and stones, common.

1. *S. perichæticalis*, WILS. Perichætical leaves very long; lid as long as capsule; calyptra twice as long. Key, No. 26.

8. FISSEDENS, HEDWIG.

So named in allusion to the divided teeth of the peristome. In damp places. Key, No. 56.

1. *F. adiantioides*, HEDWIG. 1-2in. high. Fruitstalk lateral. Wils. Bry. Brit. Key, No. 58. On damp slopes of Mount Wellington.

A. Margin of leaf thickened and hyaline.

2. *F. dealbatus*, HOOK. f. AND WILS. $\frac{1}{8}$ in high, leaves linear-oblong, acuminate, entire, nerveless. Hook. Handbook, N.Z., Fl. On wet rocks.
3. *F. rigidulus*, HOOK. f. AND WILS. 1 to 2in. long. Leaves ovate-lanceolate, acute; nerve continuous. On stones in running water, Mount Wellington.
4. *F. brevifolius*, HOOK. f. AND WILS. Stems $\frac{1}{2}$ in. high. Leaves on shoots, ovate-acuminate, entire, nerved to the apex. Capsule sub-erect or inclined. Lid, short beak. Var. *B. floribundus*, leaves longer, curled when dry. Shady banks, New Norlolk. *F. scalaris*, Mitten.
5. *F. incurvis*, HOOK. Fruiting plant $\frac{1}{2}$ in. in length; leaves lanceolate, nerve continuous. Capsule cernuous; lid conico-acuminate. St. Patrick's River.
6. *F. vittatus*, HOOK. f. AND WILS. Stem two lines high. Leaves ovate-ligulate, undulate. On the ground, Circular Head.
7. *F. Taylora*, C. MUELLER. Stem, one line long. Leaves of fertile plant amplexant, acuminate. Seta flexuose. Capsule oval, inclined. Clay banks, Mt. Wellington. *F. pygmæus*, Taylor..

B. Margin of leaf not thickened and hyaline

8. *F. pungens*, C. MUELL. AND HAMPE. Similar to *F. incurvis*, with leaves immarginate. F. V. M. Austr. Mosses; *incurvis*, var. Wils. On the ground in shady forests.

9. *F. asplenioides*, SWARTZ. Stem, $\frac{1}{2}$ to 1 in. high; leaves crisped when dry, ligulate, obtuse, crenulate, nerve not continuous. Seta stout. *F. ligulatus*, Hook f. and Wils. Fl. N.Z. Hook, Hand-book, N.Z. Fl.
10. *F. oblongifolius*, Hook f. AND WILS. Stems, $\frac{1}{3}$ - $\frac{2}{3}$ in. high; leaves not crisped when dry, linear-lanceolate, acuminate, apex crenulate, nerve not continuous. Seta slender, gracefully curved, capsule very small. On rocks, N.W. Bay.
11. *F. pallidus*, Hook f. AND WILS. Stems, $\frac{1}{4}$ in. decumbent; leaves flabellately spreading, pale yellow-green, linear lanceolate, acute, entire, nerve continuous. Lid longer than capsule. Key, No. 56. On the ground.
12. *F. tenellus*, Hook f. AND WILS. Minute. Leaves linear lanceolate, crenulate, nerve excurrent. Lid long beaked. Calyptra papillose, mitriform. On the ground.
13. *F. strictus*, Hook f. AND WILS. Stem $\frac{1}{2}$ in. high. Leaves linear lanceolate, entire, nerve almost evanescent. Fruitstalk short, thick. Capsule turbinate; lid rostrate; calyptra small, mitriform. Yorktown Rivulet.
14. *F. integerimus*, MITTEN. Stem $\frac{1}{2}$ in. high; fruitstalk scarcely two lines long. Similar to *F. oblongifolius*, but leaves entire, yellowish-brown above, black below. Cheshunt.

9. LEUCOBRYUM, HAMPE.

The name refers to the mosses being of a whitish colour. Key, No. 35.

1. *L. candidum*, HAMPE. Stem $\frac{1}{2}$ to 2 in. high. Leaves of spongy texture, falcate, recurved, ovate, lanceolate. Fruit on short lateral branches. Capsule cernuous, strumose, grooved. At the roots of trees in swampy places.

10. DICRANUM, HEDWG.

So named in allusion to the teeth of the peristome resembling a forked instrument. A very large handsome genus abundant in woods. Key, No. 36.

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10. *F. oblongifolius*, Hook f. AND WILS. Stems, $\frac{1}{3}$ - $\frac{2}{3}$ in. high; leaves not crisped when dry, linear-lanceolate, acuminate, apex crenulate, nerve not continuous. Seta slender, gracefully curved, capsule very small. On rocks, N.W. Bay.
11. *F. pallidus*, Hook f. AND WILS. Stems, $\frac{1}{4}$ in. decumbent; leaves flabellately spreading, pale yellow-green, linear lanceolate, acute, entire, nerve continuous. Lid longer than capsule. Key, No. 56. On the ground.
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13. *F. strictus*, Hook f. AND WILS. Stem $\frac{1}{2}$ in. high. Leaves linear lanceolate, entire, nerve almost evanescent. Fruitstalk short, thick. Capsule turbinate; lid rostrate; calyptra small, mitriform. Yorktown Rivulet.
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A. Leaves entire.

1. *D. Sieberianum*, HORNSCH. Stems $\frac{1}{2}$ -lin. high. Leaves yellowish, ovate-lanceolate, piliferous, margin entire, white. Fruitstalk on short lateral shoot. Hook. Handbook N.Z. Fl. Key, No. 36. *Leucodon pallidum*, Hook. Musci-Exot. On wet rocks.
2. *D. Tasmanicum*, Hook. f. Stems 1-2in. high. Leaves pale or dark-green or reddish, lanceolate oblong, obtuse, channelled, quite entire, nerve vanishing. Fruitstalk $\frac{1}{2}$ in. long. Capsule erect, turbinate, often 3-fid. *Dichodontium*, Schimper. On wet cliffs, Mt. Wellington.
3. *D. sphagni*, WAHLEHT. Stem 1in. long. Leaves yellowish, subulate, lanceolate, entire; nerve strong, excurrent.
4. *D. Starkii*, WEB. and MOHR. Stems 1-3in. long. Leaves falcato-secund, subulate-setaceous, not crisped when dry, entire, strong nerve. Capsule arcuate, strumose, striated, annulus double. Wils. Brit. Bry. Brown's River.
5. *D. (Leptotrichum) ferrugineum*, MITTEN. Stems $\frac{1}{2}$ -lin. high, dull ferruginous green, interwoven with radicles; leaves oval-oblong, attenuated, open, entire, nerve percurrent. Fruitstalk three lines long. Capsule sub-globose, erect. On the ground, Western Mountains.
6. *D. angustifolium*, Hook f. AND WILS. Stems 1-1 $\frac{1}{2}$ in. high. Leaves long, lanceolate, setaceous, entire, apex flexuose when dry, nerve narrow, excurrent. Livid hue. In bogs, Mt. Wellington.

B. Leaves serrulate.

7. *D. Billardieri*, BRIDEL. Stems, 2-4in. high. Leaves, $\frac{1}{4}$ in. long, yellow-green, ovate-lanceolate, acuminate, concave, not striate, apex serrulate, nerve slender. Capsule curved, strumose. On the sides of Mount Wellington.
8. *D. angustinerve*, MITTEN. Similar to *D. Billardieri*, but with perichæatial leaves furnished with a bristle-like point. On dead wood.

9. *D. pungens*, HOOK. f. AND WILS. Stem frequently 6in. high. Leaves secund, open, linear-lanceolate, convolute, apex carinate, serrulate, slender nerve. *D. Nov. Hollandiæ*, Hornsch. Among rocks and running water.
10. *D. setosum*, HOOK. f. AND WILS. Stems brittle, 1-4in. long, yellow, glossy. Leaves $\frac{1}{2}$ in long, fragile, very long lanceolate and setaceous, serrulate, nerve broad, excurrent in long setæ. Perichæatial leaves short, Capsule sub-erect; lid with long beak. Calyptra pale brown, red at apex. Hook. Handbook, Fl.N.Z. Springs, Mount Wellington.
11. *D. Menziesii*, TAYLOR. Stems covered with matted whitish fibrils. Leaves secund, straight when dry, subulate-lanceolate and serrulate at the base, very long setaceous point, nerve solid; perichæatial shorter. Fruitstalk hardly longer than the leaves. Substrumose capsule with long beak. *D. brachypelma*, C. Muell. Var. B. *rigidum*, dark green, more robust. Dense forests, River Acheron.
- C. Leaves spinulose, serrate.
12. *D. dicarpon*, HORN SCH. Stems 1-2in. high, covered with matted fibrils. Leaves squarrose, linear-cuspidate, striate, margin and back spinulose-serrate, nerve solid. Fruitstalks two or more together, sheathed by long perichæatial leaves. Lid with long beak. *D. leucolomoides*, C. Muell. Var. B. *spinosum*, a larger variety, with numerous longer setæ. In dense woods, New Norfolk.
13. *D. robustum*, HOOK f. AND WILS. Stems 3-5in. long, robust. Leaves sub-sekund, long subulate-lanceolate, into almost capillary points, spinulose-serrate above nerve excurrent. Capsule cylindrical, inclined, substrumose; lid with long beak. Cheshunt.

11. BLINDIA, BRUCH AND SCHIMPER.

Named in honour of Blind, of Munster. Key, No. 27. On moist Alpine rocks.

1. *B. acuta*, BR. AND SCH. Stems tufted, $\frac{1}{2}$ -3in. high. Leaves sub-sekund, rigid, glossy, oblong from a concave base, then linear lanceolate, nerve excurrent and thick. Perichæatial leaves sheathing below, open above. Capsule erect, globose, pyriform on short fruitstalk. *Weissa acuta*, Hedwg. Key, No. 27. Var. B. *curviseta*. Capsule nearly round, seta arcuate, thick. On stones, rivulet near Cumming's Head.

2. *B. arcuata*, MITTEN. Stems $\frac{1}{2}$ -lin. long. Leaves linear, slightly glossy. Fruitstalk $1\frac{1}{2}$ lines long, curved. Capsule drooping, oval; after the lid has fallen away the capsule assumes a cup form. Mitten Aus. Cat., Mitt. Musc. Austro-Americana.
3. *B. tenuifolia*, HOOK *f.* AND WILS. Dicranum. Stems lin. high. Leaves brownish, black below; secund, falcate, narrow elliptic below, gradually long and slender, capillary-subulate, margin incurved, nerve indistinct, perichætical sub-orbicular, convolute, nerve long excurrent. Capsule erect on thick short fruitstalk, oval, turbinate; lid subulate. Mitt. Sth. Amer. Mus. Rock behind Cumming's Head, Western Mtns.

12. CAMPYLOPUS, BRIDEL.

From *καμπυλος*, bent, and *πους*, a foot, alluding to the bent fruitstalk. Key, No. 37. On logs, and in swamps.

A. Leaves with white reflexed hair points.

1. *C. introflexus*, HEDWG. Leaves, base broad, concave, with a pellucid margin, suddenly contracted into a white toothed hair point. Capsule obovate, unequal; lid conical. Abundant on logs, and on the ground.

B. Leaves with straight hair points.

2. *C. torquatus*, MITTEN. Leaves of lax and spongy texture, base ovate-lanceolate, narrowed into a long subulate, setaceous, white spinulose point. Fruitstalk twisted. Capsule pyriform. Key, No. 37. On the slopes of Mt. Wellington.
3. *C. clavatus*, BROWN. Stems dichotomously branched; leaves golden yellow, lanceolate, suddenly acuminate into white, straight, short hair points.
4. *C. insititius*, HOOK. *f.* AND WILS. Leaves with a short pellucid base, erect, open, slightly recurved, when dry incurved, lanceolate, subulate, canaliculate, hair-pointed. Capsule nearly elliptic, equal, scarcely strumose. Calyptra, deeply fimbriated. About Brown's River, common.

C. Leaves subulata-setaceous.

5. *C. capillatus*, HOOK. *f.* AND WILS. Stems 1-2in. or more. Leaves bright green, glossy, ovate-lanceolate at the base, then subulate-setaceous, areolæ at the base, rectangular and pellucid. Capsule symmetrical; calyptra shortly fimbriated. Brown's River, with the preceding species.

D. Leaves obtuse.

6. *C. bicolor*, HORNSCH. Leaves, lower black, upper glossy green, subulato-lanceolate, obtuse, concave at the apex, without hair points. Nerve broad. Hook. Handbook Fl. N.Z.

13. TREMATODON, A. AND L. C. RICHARDS.

So named in allusion to the rough and unequally divided teeth of the peristome. Key, No. 38. With narrow leaves, and the habit of *Dicranum*

1. *T. flexipes*, MITTEN. Stems very short. Leaves patent, lanceolate-subulate, entire; nerve broad. Fruitstalk short, flexuose. Capsule sub-erect, equi-long with neck, teeth red, cleft; lid with curved beak. On the ground, near Cumming's Head, Western Mountains.

"The nerve occupies the whole of the upper three-fourths of the leaf, the seta flexuose, and the peristome with distinctly cleft teeth."—MITTEN.

14. DESMATODON, BRIDEL.

Banded tooth; the peristome teeth are sometimes joined by one or two bars. When highly developed, scarcely distinguishable from *Tortula*. Key, Nos. 15 and 29.

1. *D. nervosus*, BRUCH AND SCHIMPER. Stems $\frac{1}{4}$ in. high. Leaves yellow-green, spreading, ovate-oblong, apiculate, concave, margin reflexed, nerve thickened upwards, excurrent. Fruitstalk $\frac{1}{10}$ – $\frac{1}{4}$ in. long. Capsule ovoid, erect, teeth sometimes absent; lid hardly beaked. Wils. Bry. Brit. On dry earth, banks, etc.

15. TORTULA, SCHREBER.

Twisted. The peristome teeth are twisted to the left. Key, No. 33. Ubiquitous.

A. Nerve of the leaf produced into a white hair like point.

1. *T. Muelleri*, BR. AND SCHIMP. Stems elongated, covered with root fibres. Leaves crowded, erecto-patent, straight, imbricate when dry, oblong-oval, obtuse, concave; margin reflexed; nerve purple red, excurrent into a roughish hair point. Fruitstalk long, purplish. Capsule cylindric, curved. Hook. Handbook N.Z. Fl. *T. antarctica*, Hampe; *Syntrichia princeps*, De Notaris; *T. cuspidata* and *T. rubella* referred by Mitten to this common species. Mt. Rumney, generally diffused.

2. *T. antarctica*, HAMPE. Synoicous, leaves loosely twisted when dry, lanceolate-ligulate, obtuse, nerve red, fawn coloured, more lax and more twisted when dry than in *T. Muelleri*. Around Hobart, Port Sorell.

3. *T. cuspidata*, HOOK. f. AND WILS. The red nerve produced into a rather long, smooth point, wider above than *T. antarctica*, areolation less opaque, tinged with red. Leaves narrower than *T. Muelleri*, less appressed when dry. Key, No. 33. Moist earth, in woods on Mt. Wellington.

4. *T. rubella*, HOOK. f. AND WILS. Stems short, sparingly branched; leaves oblong, sub-spathulate, obtuse, red nerve excurrent into rather rough hair point. On banks, Mt. Rumney.

5. *T. papillosa*, WILS. BRYOL. BRIT. Stems short; leaves dull-green, spreading, erect when dry, obovate, sub-acute, very concave, margin flat, short hair point, strongly involute when dry, papillose at the back, and on the thick spongy gemmiparous nerve. On trees and swampy places.

B. Nerve of the leaf excurrent, not white at the apex.

6. *T. torquata*, TAYLOR. Stems short; leaves closely spirally twisted when dry, lanceolate, acuminate, margin entire, revolute. Nerve stout, scarcely excurrent. Fruitstalk pale red, slender, flexuose. Capsule erect, oblong ovate. Hook. Handbook N.Z. Fl. Cheshunt.

7. *T. Australasiæ*, HOOK. f. AND WILS. Stems short, simple, $\frac{1}{4}$ to $\frac{1}{3}$ in. long. Leaves reddish, spreading, slightly recurved, twisted and crisped when dry, sub-ligulate linear, or lanceolate, acute or obtuse, nerve red, running to the apex. Capsule cylindric-ovoid, teeth oblique but hardly twisted; lid with short beak. *Trichostomum*, Hook. and Grev. *T. fusescens*, Hook. f. and Wils. *T. rufiseta*, Taylor. Hook. Handbook N.Z. Fl. Kangaroo Point, on the ground.

8. *T. Knightii*, MITTEN. Stems $\frac{1}{4}$ - $\frac{1}{3}$ in. long. Leaves pale yellow green, crisped when dry, linear-lanceolate from an oblong, broader, transparent base; very acuminate; margins quite entire, undulate; nerve slender excurrent. Fruitstalk slender, pale. Capsule cylindric. Hook. Handbook N.Z. Fl. Wellington Falls, Mt. Wellington.

9. *T. calycina*, SCHWÆGR. Very short stem, slightly branched. Leaves yellow green, lanceolate, sub-undulate, margin flat, nerve thick, perichæatial long, sheathing. Fruitstalk $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, red, yellow above. Capsule small, elliptic-oblong sub-erect; lid with a long, slender, subulate beak. Hobart, on stones and at the foot of trees.
10. *T. pungens*, HOOK. f. AND WILS. Stems rather long, slightly branched. Leaves curled and twisted when dry, lanceolate-ligulate, margin revolute, papillose at the back, nerve strong, ending in smooth short point; perichæatial leaves longer. Capsule cylindric, curved. *T. luteola*, Mitten; *T. Tasmanica*, Hampe. Common on rocks, Grasstree Hill.
11. *T. recurvata*, HOOK. Stems short. Leaves erect, ligulate-lanceolate, slightly concave, margin revolute, nerve thick, excurrent; seta long; capsule oblong, nearly erect; lid conico-subulate. Nearly allied to *Desmatodon nervosus*, twice as tall, and more slender habit. On wet ground, Mt. Dromedary.
12. *T. scabrifolium*, MITT. The leaves furnished with a thick purple nerve with hyaline ciliiform papillæ, rough, shortly apiculate. Capsule erect on short red flexuose fruitstalk, narrow, cylindric, oblong, peristome a basilar membrane, rather long, tessellated. Mitt. Sth. Amer. Mosses.
13. *T. atrovirens*, SM. ENG. BOT. t. 2015. Stems short. Upper part of leaves open, incurved, oblong, acute, canaliculate, nerve thick, shortly excurrent, margin reflexed. Capsule on yellowish fruitstalk, oval or cylindrical, erect; lid conical, oblique. Teeth unequal, papillose, forming a short membrane at the base. Mitten's Sth. American Mosses. Kangaroo Point.
- C. Calyptra, mitriform.
14. *T. minoides*, SCHWÆGR. Leaves yellowish, crisped, of firm texture, spreading, loosely imbricate, undulate, ovate-lanceolate, acuminate; margins pellucid, often gemmiparous at the apex. On logs, in copses, Mt. Wellington.
15. *T. Latrobeana*, C. MUELL. Description not available.

16. TRICHOSTOMUM, BRIDEL.

Hairy mouth, in allusion to the 32 filiferous teeth of the peristome. Key, No. 32. Hilly districts.

A. Leaves entire.

1. *T. laxifolium*, HOOK. f. AND WILS. Stems short, $\frac{1}{4}$ in. long, simple. Leaves yellowish, distant, setaceous subulate, lower $\frac{1}{3}$ ovate, quite entire, nerve solid. Fruitstalk 1 in. long, red, capsule sub-erect, oblong, gibbous; lid conical, subulate. *Dicranum flexifolium*. Hook. Musc. Exot. On moist clayey ground.
2. *T. setosum*, HOOK. f. AND WILS. Stems $\frac{1}{4}$ to $\frac{1}{2}$ in. high. Leaves pale yellow, lower ones reddish, crowded, setaceo-subulate from an ovate lanceolate sheathing base, entire, sharply keeled, nerve broad. Fruitstalk pale; capsule oblong, oblique, annulus distinct; lid with slender beak, half as long as capsule. On banks, Huon Road.

B. Leaves granulose serrate.

3. *T. elongatum*, HOOK. f. AND WILS. Stems $\frac{3}{4}$ to 1 in. long, simple. Leaves spreading; lower, elliptic oblong; margin pellucid, suddenly contracted to a long subulate keeled point, subserrate. Fruitstalk 1 in. long, red, capsule erect, pale brown, cylindric, long; lid conico-subulate, half as long as the capsule. Mt. Wellington, Grass Tree Hill.

C. Leaves denticulate.

4. *T. Oldfieldii*, MITTEN. Stems $\frac{7}{8}$ in. long. Leaves oblong-ovate from a wide base, erect, spreading, subulate, apex sparingly denticulate, nerve occupies the upper part of the leaf; perichætil, bases longer and wider. Fruitstalk long, capsule cylindrical, arcuate, male flowers gemmiform, in the axils of the leaves of the stem. In size and appearance near to *Leptotrichum affine*, C. Muell., but with leaves twice as wide at the oblong base, and thence subulate. On the ground.
5. *T. cylindricarpum*, C. MUELL. Stems $\frac{1}{4}$ to 1 in. high, yellowish green, crowded, robust, short. Leaves long setiform, when dry slightly curled and secund, narrow from a long sheathing base, apex attenuated, denticulate, nerve occupying the whole of the upper portion of the leaf; perichætil leaves long, sheathing. Fruitstalk long, capsule erect, narrow, perfectly cylindrical, slightly curved. Among rocks, Cataract, Launceston.

6. *T. australe*, MITTEN. Stems 1 to 4in. high. Leaves lurid yellow green, lower half sheathing, linear-oblong, upper setaceous, subulate, denticulate; perichæatial elongate, convolute. Fruitstalk pale brown, $\frac{1}{2}$ in. long. Capsule ovoid, erect, brown, teeth short; lid more than half as long as the capsule. *Lophiodon longifolius* and *Didymodon longifolius*, var. 3 Fl. Antarctica. *Trichostomum longifolium* and *Distichium capillaceum*, Fl. N.Z. Hook. Handbook Fl. N.Z. Key, No. 32. At the base of Mt. Wellington.

17. DIDYMODON, BRUCH AND SCHIMPER.

Twin tooth. Notwithstanding the name, the teeth are not obviously united by a basilar membrane. Wils. Bryol. Brit. Key, No. 30. Growing on the ground and on rocks.

1. *D. papillatus*, HOOK f. AND WILS. Stems lin. long, rigid, slightly branched; branches filiform, erect. Leaves yellowish, three-farious, spreading, recurved, erect when dry, and sub-secund, ovate-lanceolate, acuminate, keeled, entire, papillose both sides, nerved. Fruitstalk $\frac{1}{2}$ - $\frac{3}{4}$ in long. Capsule erect, narrow oblong, pale, contracted at the mouth, teeth irregular, lid conical, subulate. *Zygodon tristichous*, C. Muell. *Zygodon Preissianus*, Hampe. *Leptodontium papillatum*. Mitt. Cat. On the ground around Hobart, the Hummocks.

18. DISTICHIUM, BR. AND SCHIMPER.

In allusion to the distichous or tristichous leaves. Key, No. 21. At the roots of trees, on old logs.

1. *D. capillaceum*, BR. and SCH. Stems forming dense and wide-spreading tufts, 1 to 4in. high. Leaves setaceous from a lanceolate sheathing base, quite entire. Capsule erect, ovoid oblong or sub-cylindric; teeth narrow, with distant articulation, irregularly two-cleft. Wils. Bry. Brit. On the slopes of Mt. Wellington.

19. CERATODON, BRIDEL.

Horn-tooth; the teeth of the peristome have some resemblance to ram's horns. Key, No. 34. Abundant.

A. Purple fruitstalk.

1. *C. purpureus*, BRIDEL. Stems short, dichotomously branched. Leaves dull green, spreading, oblong lanceolate, keeled, papillose on the back, margins recurved, somewhat twisted when dry, nerve strong, excurrent; perichætil, larger, sheathing, acuminate. Fruitstalk purple. Capsule nearly erect, oblong, slightly incurved, striate, nearly horizontal when dry. Teeth two fid., edges pale, lid conic. Key, No. 34. Moist burnt ground, rocks and stones, abundant.

B. Yellowish fruitstalk.

2. *C. stenocarpus*, BR. AND SCHIMP. Habit of the preceding species. Fruitstalk yellowish, capsule more or less cylindrical, cernuous, angular, seemingly strumose, peristome of short narrow brown teeth. On the ground in the bush.

20. HEDWIGIA, F. EHRHART.

Named in honour of Hedwig. Loosely tufted and creeping
Key, No. 8 and 9. On Alpine rocks, near waterfalls.

1. *H. ciliata*, EHR. 1-2in. long, forming loosely tufted patches. Leaves yellowish, imbricate when dry, ovate lanceolate, with erose diaphanous points. Perichætil larger, apices ciliate. Capsule immersed, sub-sessile, lid plain, calyptra sub-pilose. Key, No. 8. On the summit of Mount Wellington.
2. *H. imberbis*, BR. AND SCHIMP. Leaves ovate acuminate, margin revolute; perichætil, lanceolate-acuminate, sheathing, capsule sub-globose, on short pedicel, immersed. Lid conical; calyptra naked. Var. *B. Drummondii* leaves less acuminate, lid beaked. On dry rocks.

21. BRAUNIA, SCHIMPER.

Named in honour of A. Braun, Professor of Botany,
Berlin. Key, No. 10. On moist rocks.

1. *B. Humboldtii*, SCHIMP., *Hedwigia*, Hook. Stems sub-erect, 2-6in. high. Leaves obovate, acuminate, with long hair points, coriaceous; perichætil larger, sheathing, reddish, glossy. Fruitstalk $\frac{1}{3}$ to $\frac{1}{2}$ in. long. Capsule sub-globose, sulcate; lid beaked. Calyptra cucullate. On moist trap rocks and in bogs, Mt. Wellington.

22. LEPTANGIUM, MONTAGUE.

Slender capsule. Minute, tufted, growing in vegetable soil. Succulent subterraneous stem and short branches. Key, No. 11.

1. *L. repens*, MITTEN. *Hedwigia* in Fl. Tasm. *Anæctangium* in Musc. Exot. Stems very minute, $\frac{1}{8}$ - $\frac{1}{4}$ in. high. Leaves on the barren stems spreading, nearly orbicular; on the fertile, larger, whitish, imbricating, ovate, narrowed into a slender acuminate point, quite entire. Capsule immersed, mouth wide, closed by a horizontal membrane; spores large. Calyptra conical, small. Key, No. 11. North side of Cataract, Launceston.
2. *L. tumidum*, MITTEN. Leaves oblong-oval, cochleariform-concave, margin recurved, acute or short narrow apiculate, no nerve. The fruit being absent, the genus is doubtful. Mitten Austr. Catalogue.

23. GRIMMIA, EHRH.

Named in honour of Grimm, a German botanist. On rocks.

A. SCHISTIDIUM. Capsule on very short fruitstalk, hidden among the leaves.

1. *G. apocarpa*, HEDWG. Nearly black, $\frac{1}{2}$ to 3 in. long. Leaves ovate-lanceolate, apiculate or obtuse, margin reflexed, nerve vanishing below hyaline tip. Capsule elliptic, immersed, without ring. Key, No. 19. Foot of Mount Nelson.

B. GRIMMIA. Capsule on a short curved fruitstalk.

2. *G. pulvinata*, SMITH. Hoary tufts; leaves oblong-lanceolate, keeled above, terminated abruptly by a white hair, margin entire, recurved, nerve vanishing. Capsule turned downwards, ovoid, furrowed. Double ring, lid beaked, calyptra mitriform. Var. *B. Africana*, lower, capsule shorter, lid conic, very short mammilate. On trap rock.
3. *G. tricophylla*, GREVILLE. Stems short, forming loose tufts. Leaves yellow green, linear-lanceolate, narrowed into a white diaphanous hair point, flexuous, crisped when dry, nerve vanishing; capsule pendulous, ovoid, striated, angular when dry, annulus broad, teeth two-fid, lid conical, beaked. Mt. Wellington, on rocks.

4. *G. basaltica*, MITTEN. Small hoary tufts. Leaves spreading, oblong-lanceolate, acuminate with a hyaline hair point, keeled by the percurrent nerve, perichætial with a much longer hair point. Fruitstalk curved. Capsule ovoid-globose, plicate when dry. Teeth red, perforated, sub-entire, reflexed when dry, lid short, conic-acuminate. Inflorescence monoicous. Hook., Handbook N.Z. Fl. Mount Rumney, on rocks.
5. *G. funalis*, BR. AND SCHIMP. *Grimmia Schultzii*, BRIDEL. Stems tufted; leaves crowded, lanceolate, sub-secund, gradually tapering into a long rough diaphanous point, their margins recurved. Fruitstalk curved, shorter than the perichætium. Capsule shortly elliptic or obovate, furrowed, annulus very large, teeth of the peristome long, deeply bifid. Wils. Bry. Brit.

C. ORTHOGRIMMIA, Capsule on straight pedicel.

6. *G. leucophæa*, GREVILLE. Stems rather short, tufted; leaves spreading, erect, imbricated when dry, ovate-oblong, concave, with long hair points, margin plane; capsule exserted, erect, elliptical or oblong; lid short, conico-rostellate; annulus large, dehiscent, teeth bifid, perforated. Wils. Bry. Brit. On moist rocks, near Hobart.

24. PTYCHOMITRIUM, BRUCH AND SCHIMPER.

Name from πτυχη, a plait, and μίτριον, calyptra, in allusion to the furrowed calyptra. Key, No. 17. On rocks in mountainous places.

A. Leaves entire.

1. *P. acutifolium*, HOOK. f. AND WILS. Low, thick branched. Leaves dense, open, incurved, when dry twisted, lanceolate-subulate, acute, solid nerve, areolation pellucid at the base. Capsule large, erect, oval, ringed. Teeth short, partly divided, connected by a basilar membrane. On banks and trap rocks near the Derwent.

B. Leaves serrate.

2. *P. serratum*, MITTEN; *Glyphomitrium Mittenii*, JAEGER. Leaves open, recurved, ovate at the base, gradually acuminate, serrate. Capsule oval, cylindrical; lid subulate, nearly as long as the capsule; teeth rather long, red, uneven, deeply divided, approximating in pairs. Key, No. 17. On rocks, Cataract, Launceston; rocks, Proctor's Road, near Hobart.

25. RACOMITRIUM, BRIDEL.

Torn Calyptra. The calyptra is fringed. Key, No. 20.
On moist rocks in mountain districts.

A. DRYPTODON. Dichotomously branched, young shoots simple, reaching an equal height.

1. *R. crispulum*, HOOK. f. AND WILS. Loosely tufty, stems 1-1½ in. high. Leaves erecto-patent, sub-recurved, ovate-oblong, acuminate, keeled, entire; apex sub-diaphanous, nerve percurrent, perichætal shorter. Fruitstalk very short, lateral by growth of side shoots. Capsule elliptic-oblong, erect or inclined, lid conico-subulate, half as long as capsule, teeth two fid, reflexed when dry. Var. 1. Leaves shorter, destitute of a slender point. Var. 2. Leaves longer, destitute of a slender point. On trap rocks Glen Leith, rare. Rocks, North and South Huon.

2. *R. chloracarpa*, MITTEN. Similar to the preceding species, but with leaves with sub-oval base, obtuse, apiculate. Hook. Handbook N.Z.

3. *R. rupestre*, HOOK f. AND WILS. Densely tufted, 1-2 in. long. Leaves sub-spirally imbricate when dry, ovate-lanceolate or ovate-acuminate; lower sub-squarrose, upper recurved, keeled, margin sub-recurved, when dry more or less incurved and twisted; nerve scarcely continuous, red; perichætal broader, elliptic-oblong, obtuse. Fruitstalk very short, twisted when dry. Capsule small, erect, elliptic-oblong, red-brown, mouth contracted; teeth red, spreading when dry. Lid with a very slender beak, nearly as long as the capsule. Hook. Handbook N.Z. Fl. Moist rocks on the mountains.

4. *R. protensum*, BRAUN. Loosely tufted, leaves light green, spreading all round or sub-secund, appressed when dry, rather rigid, elongate-lanceolate, not diaphanous at the summit; nerve strong, percurrent; perichætal, somewhat sheathing. Fruitstalk pale, ½ in. long. Capsule sub-cylindrical, pale brown, thin walled; teeth long, irregularly split to the base; lid usually as long as the capsule, beaked. Wils. Bry. Brit. On Mount Wellington.

B. *Racomitrium*, irregularly branched, branches short, young shoots not reaching to an equal height.

5. *R. symphyodon*, MITTEN. Elongate, rather short branches with bunches of leaves; leaves spreading, sub-secund, erect when dry, ovate-lanceolate, acuminate, with hyaline points, margin recurved below, perichætal acute. Fruitstalk yellow, short; capsule cylindric, mouth small; teeth stout, with transverse connecting bars. Calyptra rather rough at the apex. Key, No. 20. On rocks, Mount Wellington.

6. *R. heterostichum*, HEDWG. Stems with short lateral branches of unequal height; leaves spreading, sub-secund, lanceolate-acuminate, ending in a flaccid hyaline hair. Capsule elliptic-cylindrical and obovate-oblong; teeth deeply bifid. Var. *B. alopecurum*, leaves with shorter hair points, less capsule, with shorter fruitstalk. Var. γ , *gracilescens*, leaves obtuse. On stones and rocks, abundant.

7. *R. lanuginosum*, HEDWG. Stems wide, fasciculately branched, leaves erecto-patent, recurved, lanceolate-acuminate, apex erose-dentate, produced into a long hyaline hair. Minute ovoid capsule on very short rough fruitstalk, teeth bipartite, filiform. Var. *pruinosa*, apices of leaves strongly inciso-serrate, whitish. Summit of Mt. Wellington.

26. ENCALYPTA, SCHREBER.

Veiled, alluding to the calyptra entirely covering the capsule. Key, No. 6. On Alpine heights.

A. Tip of calyptra papillose.

1. *E. vulgaris*, HEDWG. Leaves ligulate, nerve vanishing. Capsule generally gymnostomous, the entire base of the calyptra reaching to the neck of the capsule. Var. *B. obtusa*.

B. Tip of calyptra smooth.

2. *E. australis*, MITTEN. Similar to *E. vulgaris*, leaves ligulate below, upper oblong-spathulate, rather obtuse, margin papillose, scarcely denticulate, rough at the back below the apex. Capsule with lid equal in length, Calyptra smooth at the tip. Key, No. 6. Differs from *E. vulgaris* in the less rounded apices of its leaves and smooth point of the calyptra.

In Mitten's Catalogue of Australian Mosses, *E. vulgaris*, *E. Australis*, and *E. ciliata*, are referred to *E. Tasmanica*, Hampe and C. Muell. in Linnæus, 1853.

27. MACROMITRIUM, BRIDEL.

Long calyptra. Common on trunks of trees. Key, Nos. 7, 16, and 43.

B. CALYPTRA GLABROUS, lid long-beaked.

1. *M. longirostre*, SCHWÆGR. Branches erect, 1 in. high, crowded. Leaves bright yellow, red, or bronze, lower black, twisted when dry, linear lanceolate, very acute, with two parallel lines, one on each side the solid stout nerve, margins recurved, nerve reddish. Fruitstalk stout, short, $\frac{1}{3}$ to $\frac{1}{4}$ in. long, black. Capsule sulcate, elongate, narrow, almost linear-oblong, gradually narrowed into the stout fruitstalk; peristome single, lid with slender straight beak, calyptra glabrous, fimbriated half-way up. Var. *B. acutifolium* leaves more acuminate, with a sub-excurrent nerve. Hook. Handbook N.Z. Fl.

Lid conical.

2. *M. asperulum*, MITTEN. Stems slender, creeping; branches short, tufted. Leaves red-brown, dense, spreading, incurved when dry, ligulate from an oblong base, lower obtuse, upper acute, mucronate by the excurrent nerve; margins papillose, rough; perichætil shorter, acute. Fruitstalk $\frac{1}{4}$ in. long. Capsule ovoid, attenuate below; peristome 0; mouth darker, plaited, lid conical, acuminate. Calyptra naked, Hook. Handbook, Fl. N.Z. Mt. Wellington.

Leaves canaliculate.

3. *M. Reinwardtii*, SCHWÆGR. Leaves open, slightly incurved; when dry curling, from a narrow lanceolate base acuminate, canaliculate; perichætil broadly lanceolate, acuminate; nerve excurrent. Fruitstalk long, capsule ovate, short neck, plicate mouth, 16 narrow teeth. Calyptra glabrous.

Nerve vanishing.

4. *M. pusillum*, MITT. Leaves when dry spirally twisted; when moist open, linear-lanceolate, apex short, apiculate; nerve brownish, vanishing under apex, keeled, entire; perichætil very short, ovate-acuminate. Fruitstalk short, capsule oval, plicate, mouth deep coloured, calyptra naked. Key, No. 7. On stones, Cataract Hill.

Leaves minutely erose.

5. *M. Archeri*, MITTEN. Leaves when dry twisted, slightly curling, when moist open elliptic below, from thence lanceolate, slightly obtuse, nerve excurrent, keeled, very shortly apiculate, margin minutely erose; perichætal short, wide, acute. Capsule elongate-oval, deep coloured plicate mouth. Peristome of lid subulate. Calyptra naked. On dead branches of trees, Kermandie Rivulet.

6. *M. Scottiæ*, C. MUELL. No description available.

B. CALYPTRA PILOSE. Capsule ground.

7. *M. microphyllum*, HOOK. ET GREV. Stems and branches slender, 1-2in. long. Leaves yellow-brown, when dry, striate and oppressed, ovate or subulate-lanceolate, acute, keeled, two striæ at the base, pellucid, papillose above; nerve stout, vanishing below the tip. Fruit-stalk slender, capsule oval-oblong or sub-pyriform slightly grooved; peristome short, undivided. Calyptra hairy. Key, No. 16. On trees in creeks and damp woods.

Capsule smooth.

8. *M. microstomum*, HOOK AND GREV. Leaves spreading, sub-incurved, ligulate-lanceolate, obtuse, papillose, apiculate, areolation lax, nerve reddish. Capsule oval, smooth, plicate mouth. Calyptra slightly hairy. Near Hobart, altitude 1,400 feet.

28. ORTHOTRICHUM, HEDWIG.

Straight hairs, in allusion to the calyptra being covered with straight hair-like processes. Key, No. 44. On branches and rocks.

1. *O. crispum*, HEDWG. Leaves linear lanceolate, undulated, dilated at base, much twisted and crisped when dry; capsule clavate, long tapering apophysis, striated, contracted below the mouth; calyptra campanulate, very hairy. Wils. Bry. Brit. Key. No. 44. Trunks of trees, St. Patricks River.

2. *O. lutuæ*, MITTEN. Leaves linear lanceolate, keeled, pale yellow, oblong concave below, nerve yellow, vanishing; margin erose; perichætal longer. Fruit-stalk double length of capsule, capsule cylindric oblong, plicate, teeth eight bigemminate; inner, eight cilia; lid with short beak, calyptra hairy. On trees, rivulet behind Cumming's Head. Mt. Wellington.

3. *O. Tasmanicum*, HOOK. f. AND WILS. Leaves lanceolate subulate, margins reflexed, slightly crisped; fruitstalk rather long; capsule elliptic-oblong, striata when dry. Internal peristome eight rather wide cilia, keeled, entire, connivent. Calyptra pale, shining. On twigs of bushes, Launceston.

4. *O. Laurencii*, MITTEN. Leaves ovate-lanceolate, acute, keeled, upper margin erose; perichæatial similar. Capsule oval-cylindric, plicate to the base, on fruitstalk half as long, lid with short beak. Teeth eight, yellow, reflexed when dry, cilia eight similar in size and colour.

29. ZYGODON, SIR W. J. HOOKER.

Yoke tooth, in allusion to the paired teeth of the peristome. Key, Nos. 14-24. On trunks of trees and rocks.

A. Leaves entire. Peristome single.

1. *Z. anomalus*, DOZY AND MOLKE. Stems short, scarcely branched, yellow green, margins undulate, flexuous; when dry, loosely twisted and crisped, oblong lanceolate, keeled, entire; nerve short, excurrent; perichæatial shorter, lanceolate-acuminate, erect. Fruitstalk reddish yellow, flexuose. Capsule sub-pyriform, sulcate, mouth contracted, pale brown; lid conic-rostrate. Gully near the Avon, on decayed wood.

2. *Z. intermedius*, BRUCH. AND SHIMP. Stems branched. Leaves lax, erecto-patent, lanceolate-lingulate, sub-acute. Inner peristome, eight cilia. Key, No. 74. On trees, Mount Wellington.

Peristome double.

3. *Z. Brownii*, SCHWÆGR. The branches reaching an equal height; leaves pale green, spreading, recurved squarrose, oblong, acute; nerve continuous and excurrent. Fruitstalk very slender, $\frac{1}{4}$ to $\frac{1}{2}$ in. long. Capsule pyriform, furrowed; peristome double, outer often rudimentary or irregular; in var. 8 cilia. Hook. Handbook N.Z. Fl. Common on rocks, bark of trees, &c., throughout the island.

4. *Z. minutus*, C. MUELL. AND HAMPE. Densely tufty, short, yellowish, tender very short, densely-leaved shoots; stem leaves densely imbricate when moist; when dry strict, oblong lanceolate, acuminate, keeled, entire, convex, nerve strong yellow, excurrent; perichætical narrow. Yellow tender fruitstalk. Capsule erect, oval-pyriform, and striate. Lid conical-oblique, acuminate, external teeth, 16 gemminate, very short, closely joined. Internal, eight cilia in very tender reticulate membrane. Similar to *Codonoblepharum Menziesii*, but distinguished by excurrent nerve and different peristome.

B. Leaves dentate.

5. *Z. cyathicarpus*, MONTAGUE. Leaves pale green, spreading, sub-recurved, crisped when dry, linear-lanceolate, acute, keeled, remotely denticulate; perichætical overtopping the capsule. Fruitstalk very sharp; capsule cup form, gymnostomous, striate; lid convex, oblique-beaked. Key, No. 14. Var. Leaves with pellucid nerve. On the ground, Dromedary, New Norfolk.

30. CODONOBLEPHARUM, C. T. SCHWÆGRICHEN.

So named in allusion to the inner peristome conniving and forming a campanulate cone. Key, No. 47. On bark of trees.

1. *C. Menziesii*, SCHWÆGR. Stems tufted, densely fastigately branched, $\frac{1}{4}$ in. high. Leaves crowded, sub-erect, yellow brown when old, lingulate, apiculate, keeled, nerve nearly continuous, strong, reddish, vanishing. Fruitstalk $\frac{1}{10}$ in. long, slender. Capsule pyriform, pale, strongly grooved, contracted below the mouth; peristome double, inner 16 cilia conniving and forming a campanulate cone; lid convex, obliquely beaked. *Z. Drummondii*, Taylor; *Z. Menziesii*, Mitten. Fl. Tasm. and Hook. Handbook N.Z. Fl. On the bark of trees, on the ground near the sea.

31. LEPTOSTOMUM, BROWN.

Slender mouth. In damp woods in crevices of rocks. Key, No. 21.

1. *L. inclinans*, BROWN. Leaves erect, open, loosely imbricate when dry, ovate oblong, obtuse, with a flexuous long hair point toothed at the tip; margin recurved; nerve stout, pale. Fruitstalk slender; capsule inclined obovoid-clavate, lid conico-hemispheric. *Gymnostomum inclinans*. Hook. Musc. Exot. Key, No. 21. On moist rocks, top of Grass Tree Hill.

2. *L. gracile*, BROWN. 2-3in. high, closely imbricate when dry, leaves with straight hair point, toothed at the tip; lid hemispherical. Hook. Handbook. Mt. Wellington.
3. *L. Menziesii*, Hook. Tufty. Intermixed with radicles below. Leaves open, elliptic-oblong, apices acuminate, nerve excurrent in long flexuous hair, margin subserrulate, perichætil narrow, subulate, hair rather rough. Fruitstalk rather short, capsule inclined, cylindrical curved; lid conic, oblique, acuminate. Mitten's Sth. Amer. Mosses, p. 274. Mt. Wellington.
4. *L. macrocarpum*, BROWN. Leaves elliptic-oblong, slightly obovate, concave, margin revolute, terminated by a branched hair. Capsule erect, ovate-oblong, small mouth. Lid conic-obtuse. *Bryum Macrocarpum*. Mt. Wellington.

32. LEPTOTHECA, SCHWÆGRICHEN.

Slender capsule, the same as *Aulocomnion* in Hook. Handbook to N.Z. Fl., named in allusion to the plaited capsule. Key No. 50.

1. *L. Gaudichaudii*, SCHWÆGR. Stems erect, slightly branched; leaves lax, erecto-patent, oblong, cuspidate by the excurrent nerve, strongly toothed; capsule erect, narrow, cylindrical. On moist rocks, Mt. Wellington.

33. MNIOPSIS, MITTEN.

Acrocarpous. Areolation hexagonal. Outer peristome, 16 teeth; inner, alternating processes from a basilar membrane. Calyptra mitriform, small. Key No. 42.

1. *M. plumula*, MITT. Stems $\frac{1}{4}$ to $\frac{1}{2}$ in. high, dull green. Leaves inserted horizontally in fertile stems, patent, ovate. Perichætil, ligulate, obtuse. Leaves of sterile stems distichous, vertically inserted, oblong ovate, acute or obtuse; nerve vanishing. Fruit-stalk two lines long. Capsule ovoid-cylindrical, equal. Lid subulate. External teeth long, narrow, red. Below the quarry, Ovens Creek.

34. ORTHODONTIUM, SCHWÆGR.

Straight tooth. In allusion to the filiform straight teeth of the inner peristome. Key, No. 51. On rocky ground and on old logs.

1. *O. Australe*, Hook. f. AND WILS. Stems $\frac{1}{2}$ in. long, branched to an equal height. Leaves erecto-patent, slightly recurved, linear, sub-flexuose, nerve sub-continuous. Capsule sub-erect, oblong, short neck. Outer teeth 16, lanceolate-subulate, when dry inflexed to the mouth of the capsule; inner, 16 cilia, filiform. Lid conico-rostellate. Key, No. 54. Kangaroo Bottom, Mt. Wellington.

2. *O. lanceolatum*, MITT. No description available.

35. LEPTOBRYUM, BR. AND SCHIMP.

Slender moss. Growing in dense silky light green patches on sandstone rocks. Key No. 53.

1. *L. pyriforme*, BR. AND SCHIMP. *Bryum pyriforme*, Hedwig. Stems simple, $\frac{1}{4}$ in. long, very slender, rooting only at the base. Lower leaves lanceolate, entire, scattered; upper leaves longer, the terminal ones crowded into a spreading tuft, elongated, linear setaceous, slightly serrated, flexuose, flat, nerved almost or quite to apex. Fruitstalk slender, flexuose, capsule inclined or pendulous, pear-shaped, glossy, golden brown, thin texture, not shrinking when dry, somewhat pellucid, mouth small. Lid convex, mammilate. Wils. Bry. Brit. Key No. 53. On decayed wood, Back River Gully, near River Nile.

2. *L. sericeum*, HAMPE. Tufty, fertile stems, very short. Leaves straw colour, erecto-patent, loosely imbricate, ovate from the base, subulate, excurrent piliform nerve; perichætil similar. Fruitstalk 1 in. long. Capsule with pyriform neck $1\frac{1}{2}$ lines long, mouth oblique, lid conic-convex, outer teeth lanceolate subulate, inner, a membrane with ciliiform processes. Mitten's Sth. Amer. Mosses, p. 305.

BRACHYMENIUM, HOOKER.

Short membrane, in allusion to the inner peristome. Key, No. 42.

1. *B. lanceolatum*, Hook. f. AND WILS. Stems $\frac{1}{4}$ to $\frac{1}{2}$ in. high, tufted, dense young shoots. Leaves, when dry, linear lanceolate, acuminate entire, subflexuose, keeled, nerve continuous, areolation lax, pellucid. Fruitstalk 1 in. long. Capsule sub-erect, oval-pyriform, short, plicate; lacerate membrane, divided irregularly into 16 cilia. Lid short, conical, calyptra cucullate.

37. MIELICHHOFERIA, HORNSCH.

Named in honour of Mielichhofer. The fructification of this genus is *cladocarpous*, an intermediate state between *acrocarpous* and *pleurocarpous*. Key, No. 39.

1. *M. Eckloni*, HORNSCH. Fertile stems very short, nearly basilar. Leaves ovate-lanceolate, acuminate, apex serrulate, nerve vanishing. Long fruitstalk. Capsule cernuous, obovate, pyriform, thence gibbous, outer teeth 16, imperfect; inner, 16 filiform cilia, connected. Key, No. 39. On the ground, Gullies Road, Brown's River.

2. *M. microdonta*, MITT. CAT. No description available.

38. BRYUM, LINN.

From *βρυον*, a moss. One of the largest genera of mosses, chiefly found in cold and mountainous districts. Key No. 54.

A. UPPER LEAVES ROSULATE. Nerve sub-excurrent, leaf not waved.

1. *B. truncorum*, BRIDEL. Stems 1-2in. high, terminal ones rosulate, recurved, crisped when dry, obovate-acuminate, thick margin, recurved below, nerve sub-excurrent. Fruitstalk, curved at the top, capsule narrowed into the fruitstalk, elongate, cylindric, arcuate, drooping; lid short, conical-apiculate. Procter's road, on damp ground.

Nerve excurrent as a long point.

2. *B. campylothecium*, TAYLOR. Stems 1-2in. high, tomentose. Leaves pale yellowish, imbricate, coriaceous, erecto-patent, upper rosulate, but not spreading, obovate-oblong, sub-acute, obscurely serrulate at the apex, not concave; margins thickened, reflexed; nerve excurrent as a long point. Fruitstalk slender; capsule pendulous curved, ovate-oblong or pyriform, with a narrow obconic apophysis; lid conical, mamillate. Hook. Handbook, N.Z. Fl. On the ground, near Proctor's Road.

Leaves crisped and waved when dry.

3. *B. Billardierii*, SCHWÆGR. Stems $\frac{1}{2}$ in to 1in. high; upper leaves rosulate, pale green, spreading, crisped, and undulate when dry, ovate-oblong, sub-acute; margin not thickened, reflexed below, apex serrate, nerve sub-excurrent. Fruitstalk stout; neck of capsule curved, suddenly narrowed, drooping, clavate pyriform. Lid sub-conical. Key, No. 54. Wellington Falls.

Nerve reddish.

4. *B. rufescens*, HOOK. *f.* AND WILS. Closely allied to preceding species, stems more slender. Leaves spathulate, softer, reddish areolation at the base, margin scarcely recurved; nerve reddish. Capsule clavate, arcuate, slightly pendulous, purple mouth. Var. *B. mammilatum*, long excurrent nerve, capsule shorter. Var. γ , *brevifolius*, leaves shorter, concave; capsule shorter. About Hobart, and near Risdon.

B. UPPER LEAVES NOT LARGER OR SPREADING. DISTINCTLY SERRULATE.

Leaves small, oblong-ovate, not crisped.

5. *B. obconicum*, HORNSCH. Stems with lateral shoots; leaves oblong-ovate, acuminate, scarcely twisted when dry, serrulate at the apex, slightly keeled. Nerve excurrent, cuspidate; capsule subpendulous, clavate, with a long neck; lid convex, mammilate. Circular Head.

Leaves small, oblong-ovate, crisped when dry.

6. *B. lævigatum*, HOOK. *f.* AND WILS. Stems $\frac{1}{2}$ to 2in. long, tomentose. Leaves pale yellow green, subserrulate towards apex, very concave, coriaceous, nerve solid. Capsule ovate-oblong, pendulous, lid obtuse conical. On wet rocks.

Leaves lanceolate.

7. *B. nutans*, SCHREB. Stems very short, upper leaves long, lanceolate, apices serrate; lower, ovate-lanceolate, entire, capsule drooping or pendulous, oblong-pyriform. Lid large, convex, papillose. Antheridia in pairs in axes of perichætil leaves. Western Mountains, Mt. Wellington.

C. UPPER LEAVES NOT LARGE AND SPREADING, ENTIRE, OR VERY OBSCURELY SERRULATE.

Leaves whitish, silvery.

8. *B. argentium*, LINN. Stems very short. Leaves silvery or glaucous, imbricated, broadly ovate, apiculate, concave, quite entire, nerve vanishing below the middle, cells lax. Capsule pendulous, ovoid, red. Lid mammilate. Var. *niveum*; young shoots obtuse, white leaves. Surrey Hills.

Leaves obtuse.

9. *B. blandum*, HOOK. *f.* AND WILS. Stems tufted flaccid. Upper leaves pale yellow green, shining, lower reddish, loosely imbricate, oblong, obtuse, quite entire, concave. Nerve slender, not quite continuous, reddish, cells lax. Capsule clavate pyriform, cernuous. Var. *B. luridum*.

Nerve reddish.

4. *B. rufescens*, HOOK. *f.* AND WILS. Closely allied to preceding species, stems more slender. Leaves spathulate, softer, reddish areolation at the base, margin scarcely recurved; nerve reddish. Capsule clavate, arcuate, slightly pendulous, purple mouth. Var. *B. mammilatum*, long excurrent nerve, capsule shorter. Var. γ , *brevifolius*, leaves shorter, concave; capsule shorter. About Hobart, and near Risdon.

B. UPPER LEAVES NOT LARGER OR SPREADING. DISTINCTLY SERRULATE.

Leaves small, oblong-ovate, not crisped.

5. *B. obconicum*, HORNSCH. Stems with lateral shoots; leaves oblong-ovate, acuminate, scarcely twisted when dry, serrulate at the apex, slightly keeled. Nerve excurrent, cuspidate; capsule subpendulous, clavate, with a long neck; lid convex, mammilate. Circular Head.

Leaves small, oblong-ovate, crisped when dry.

6. *B. lævigatum*, HOOK. *f.* AND WILS. Stems $\frac{1}{2}$ to 2 in. long, tomentose. Leaves pale yellow green, subserrulate towards apex, very concave, coriaceous, nerve solid. Capsule ovate-oblong, pendulous, lid obtuse conical. On wet rocks.

Leaves lanceolate.

7. *B. nutans*, SCHREB. Stems very short, upper leaves long, lanceolate, apices serrate; lower, ovate-lanceolate, entire, capsule drooping or pendulous, oblong-pyriform. Lid large, convex, papillose. Antheridia in pairs in axes of perichæatial leaves. Western Mountains, Mt. Wellington.

C. UPPER LEAVES NOT LARGE AND SPREADING, ENTIRE, OR VERY OBSCURELY SERRULATE.

Leaves whitish, silvery.

8. *B. argentium*, LINN. Stems very short. Leaves silvery or glaucous, imbricated, broadly ovate, apiculate, concave, quite entire, nerve vanishing below the middle, cells lax. Capsule pendulous, ovoid, red. Lid mammilate. Var. *niveum*; young shoots obtuse, white leaves. Surrey Hills.

Leaves obtuse.

9. *B. blandum*, HOOK. *f.* AND WILS. Stems tufted flaccid. Upper leaves pale yellow green, shining, lower reddish, loosely imbricate, oblong, obtuse, quite entire, concave. Nerve slender, not quite continuous, reddish, cells lax. Capsule clavate pyriform, cernuous. Var. *B. luridum*.

Leaves ovate-lanceolate, keeled.

10. *B. bimum*, SCHREB. Stems matted with purple radicles, $\frac{1}{2}$ -3in. high. Leaves yellowish green, spreading, slightly twisted when dry, ovate-lanceolate, keeled, quite entire, nerve excurrent, mucronate. Capsule obovate-pyriform or obconical. Lid large, convex, mammilate. Huon-road.

Leaves lanceolate, keeled, crisped.

11. *B. torquescens*, BR. AND SCHIMP. Stems matted, covered with radicles; leaves much crisped when dry, lower, distant, narrow lanceolate, keeled, margins reflexed, upper crowded, oblong-lanceolate, all concave, quite entire, nerve excurrent. Fruitstalk curved at top; capsule pendulous, subincurved, narrow obconic, with a tapering neck, red-brown, lid broad, mammilate, purple, shining. Wils. Bry. Brit., Mt. Wellington.

Leaves elliptic, lanceolate, not crisped.

12. *B. Tasmanicum*, HAMPE. Leaves elliptic-lanceolate, quite entire, nerve excurrent, sub-piliferous, margin recurved. Fruitstalk long; capsule drooping, oval, with neck as long as capsule. Differs from *B. bimum* by longer leaves, more acuminate, and nerve longer excurrent.

Leaves ovate-oblong, nerve scarcely excurrent.

13. *B. crassum*, HOOK. f. AND WILS. Stems elongate, rigid, tomentose. Leaves crowded at the apices of branches; lower, minute, scale-like. Closely imbricate when dry, upper leaves coriaceous, ovate-oblong, acute, concave, margin recurved, almost entire, stout nerve. Capsule pendulous, oblong-pyriform or subcylindric; lid conical, apiculate. Woods on Mt. Wellington.

Leaves ovate-lanceolate; lid yellow, large, mammilate.

14. *B. cæspititium*, LINN. Yellowish or intense green compact tufts; stems 2 lines to lin. long, with branches and innovations, terminal leaves largest, ovate-acuminate or ovate-lanceolate, nerve excurrent, margin reflexed, not thickened, apex sometimes serrulate. Capsule variable in shape, pendulous, usually oblong-ovate, constricted below the mouth when dry. Lid yellow, large, mammilate. Wils. Bry. Brit. Var. *crinitum*, leaves sub-piliferous, fruitstalk longer, capsule oblong.

Leaves oblong-lanceolate ; lid shortly conical, apiculate.

15. *B. chrysoneuron*, C. MUELL. *B. duriusculum*, Hook. f. and Wils. Stems short, leaves spreading or erectopatent, rather rigid, erect when dry, oblong-lanceolate, acuminate, concave, margins quite entire, reflexed; nerve stout, excurrent, or almost so. Fruitstalk very slender, flexuous, capsule cernuous, oblong-pyriform or cylindric, narrow at the base; operculum shortly conical, apiculate. Inflorescence dioicous. Hook. Handbook N.Z. Fl.

Leaves ovate-oblong, piliferous ; lid reddish, apiculate.

16. *B. capillare*, HEDWG. Stems $\frac{1}{4}$ to 1 in. long, radiculose below. Leaves more or less spreading, strongly contorted when dry ; lower leaves ovate-oblong, apiculate ; terminal, larger, obovate-oblong, with long slender points, nerve ceasing below the apex or excurrent ; capsule sub-pendulous, oblong-pyriform, clavate or obovate ; lid apiculate. Inner peristome deeply coloured. Wils. Bry. Brit.

Leaf-margin flat ; capsule rounded at base.

17. *B. pacytheca*, C. MUELL. Stems short, $\frac{1}{4}$ to $\frac{1}{2}$ in. high ; leaves pale dull green, widely ovate-acuminate, concave, margin nearly plain, nerve thick and excurrent. Fruitstalk short, capsule pendulous, ovoid, ventricose, rounded at the base, red-purple, lid short, sub-conical. Var. *B.* leaves narrow, thicker nerve. Var. γ . *inflatum*, leaves nearly round, concave, incurved. Dry earth, Macquarie Plains, Bellerive.

Fruitstalk very short ; capsule very long, arcuate-clavate.

18. *B. clavatum*, Hook. f. AND WILS. Leaves erectopatent, sub-coriaceous, elliptic-lanceolate, concave, thick excurrent nerve. Lid sub-conical. On the ground.

Nerve excurrent, sometimes denticulate.

19. *B. intermedium*, WEB. AND MOHR. Cæspitose, stems radiculose, branched, sterile branches slender, with loosely-imbricated leaves ; leaves more or less spreading, ovate-acuminate, ovate or oblong, or elongate-lanceolate, nerve excurrent, longish, cuspidate, sub-denticulate, margin recurved. Capsule pendulous, nearly pyriform, sub-clavate, long neck, lid acute, persistent. Turf banks, Glen Leith.

Stem bright red ; leaves elliptic.

20. *B. rubiginosum*, Hook. f. AND WILS. Stems rigid, elongate. Leaves distant, yellowish-green, membranous, lax, erecto-patent, apices recurved, elliptic, slightly acute, decurrent, nerve vanishing, areolation pellucid. In wet places (barren specimens only).

39. AULCOMNION, SCHWÆGRICHEN.

Furrowed moss. In allusion to the furrowed dry capsule. Key, No. 49. At the roots of trees.

1. *A. palustre*, SCHWÆGCHR. Stems 2-4 in. long, beset almost to the summit with ferruginous radicles. Leaves flexuose, twisted when dry, linear-lanceolate, margin reflexed, apex erose, denticulate. Capsule ovoid or oblong, sub-cylindrical, cernuous, short neck, sulcate when dry ; peristome double ; lid convex, short beak. Var. Stems slender, leaves crisped. Formosa (Barren specimens only, with pseudopodia).

40. BARTRAMIA, HEDWG.

Named in honour of John Bartram, an American botanist. The English name is apple moss, common in Alpine and sub-Alpine localities. Key, No. 45.

A. BARTRAMIDULA. Capsule gymnostomous.

1. *B. pusilla (glyphocarpa)*, Hook. f. AND WILS. Stem scarcely two lines in height, the very short stem growing from a creeping stolon. Branches few, sub-fasciculate, curved, slender. Leaves erecto-patent, very small, ovate, slightly acute, cells lax, sub-entire, with a faint vanishing nerve ; perichætil, short, erect. Capsule reddish-brown, pendulous, and globose ; fruitstalk short, arcuate at apex, pale ; lid sub-conical. Brown's River, Mt. Wellington.

B. PHILONOTIS. Capsule with peristome, striate ; with short branches of unequal height (fasciculate), male flowers discoid.

Leaves distant, serrulate, margins flat.

2. *B. remotifolia*, Hook. f. AND WILS. Stems $\frac{1}{4}$ in. short, slender, not thicker than fruitstalk, fasciculately branched ; branches short, slender, recurved ; leaves glaucous, distant, spreading, loosely crisped when dry, lanceolate-acuminate, serrulate, margin plane ; narrow pellucid excurrent nerve ; perichætil longer, erect. Fruitstalk stout, long ; capsule sub-erect. *Philonotis appressa*, Mitten. Brown's River, Elliott Rivulet.

Leaves serrulate, inner teeth connected.

3. *B. tenuis*, TAYL. Stems slender, fasciculately branched; branches slender, flexuous; leaves loosely spreading, secund, narrow, lanceolate, serrulate, margins flat, acuminate, with a long spinous point, nerve excurrent; perichæatial erect, setaceous point. Fruitstalk long, slender. Capsule inclined; cilia of internal peristome connected at apices; male flowers capitulate, perigonial leaves incurved, long acuminate, serrulate. Deep Gully, Mt. Wellington.

Leaves entire.

4. *B. affinis*, HOOK. Stems tomentose, sparingly fasciculately branched; leaves erecto-patent, strict, ovate-lanceolate, acuminate, almost entire, margin recurved, stout nerve, long excurrent. Fruitstalk short. Capsule sub-pendulous, oblong, sub-pyriform, sulcate. Lid conical. Kangaroo Bottom, Mt. Wellington.

BREUTELIA, leaves sheathing, plicate, squarrose; inflorescence dioicous; male flowers discoid.

Upper cells of leaf short, capsule pendulous.

5. *B. pendula*, HOOK. Stems tomentose, branches fascicled; leaves spreading, ovate-lanceolate, long acuminate, serrulate, striate, nerve excurrent. Fruitstalk elongate; capsule pendulous, oblong, sulcate. Mt. Wellington. Alt., 2,000ft.

Nerve sub-excurrent, leaves plicate.

6. *B. crassa*, HOOK f. AND WILS. Stems lin. high, tomentose, rigid, sparingly and vaguely branched; leaves yellowish, glossy, not crisped when dry, dense, patent, generally secund, amplexicant, ovate at the base, lanceolate-acuminate, plicate, serrulate, nerve narrow, sub-excurrent. Fruitstalk $1\frac{1}{2}$ in. long, capsule large, oblong, inclined. Creek above Wellington Falls.

Upper cells of leaf long, capsule pendulous.

7. *B. Sieberi*, HORNSCH. Stems lin. high, procumbent or sub-erect, tomentose, leaves yellowish green, not shining, erecto-patent, lanceolate, nerve narrow, excurrent, setaceous at the point, margin serrulate, recurved below, cells elongate, narrow, papillose, Fruitstalk lin. high, red; capsule pendulous, ovoid, plicate; lid flat-conical; peristome small, normal.

Leaves divaricating (widely spreading asunder).

8. *B. divaricata*, MITT. Stems elongate, almost simple, tomentose below; leaves divaricating, the bases sheathing, lanceolate, plicate, papillose, serrulate, nerve excurrent, mucronate, slender. Perichæatial ovate, entire, nerve very slender. Flaccid appearance when dry. Fruitstalk long; capsule horizontal, ovoid oblong, neck attenuated, pyriform; lid conical, peristome normal. Cheshunt.

Much fasciculately branched above, capsule inclined.

9. *B. comosa*, MITT. Stems tomentose below, much fasciculately branched above; leaves divaricating, sheathing base, short, erect, obovate, blade narrow, lanceolate, serrulate, plaited, minutely papillose, nerve excurrent in a slender point; perichæatial smaller, ovate-lanceolate. Fruitstalk $1\frac{1}{2}$ in. long; capsule ovoid, inclined, grooved; lid conical, peristome normal. Western Mountains, Mount Wellington.

Stems dichotomously branched.

10. *B. elongata*, MITT. Stems very robust, curved, ascending, 4-6 in. long, $\frac{1}{8}$ in. in diameter, very sparingly branched. Leaves closely imbricate, sub-erect and sub-secund, pale yellow and shining when dry, ovate-lanceolate, acuminate, plaited, often waved, serrulate, papillose at the back; nerve slender, excurrent. Hook. Handbook, Fl. N.Z.

11. *B. commutata*, HAMPE. Description not available.

BARTRAMIA, stems dichotomous, fastigiately branched. Male flowers gemmiform.

Capsule apparently lateral, hidden among the leaves.

12. *B. Halleriana*, HEDWG. Stems elongate, 2 to 6 in. high, vaguely fastigiately branched; leaves yellow-green, spreading or secund, broad and sheathing at the base, linear-subulate, serrulate above; fruitstalk short; capsule sub-globose, immersed; lid conical. Key, No. 45. Mt. Wellington, Western Mountains.

Fruitstalk apparently lateral, $\frac{1}{4}$ in. long.

13. *B. papillata*, HOOK *f.* AND WILS. Stems 1 in. high, sparingly branched; leaves crowded, pale, patent or erecto-patent, subulate, with an obovate sheathing base, minutely serrulate, papillose at the back, nerve solid; capsule sub-erect. *B. acerosa*, Hampe. On rocks, Dry Hill, Back River.

Leaves easily detached, fragile.

14. *B. fragilis*, MITT. Densely tufty, stems erect, nearly simple. Leaves densely crowded, easily detached, suddenly contracted from an oblong base to long subulate lanceolate, margin and back serrulate, nerve percurrent. Fruitstalk very short; capsule erect, red, globose, furrowed; lid short, conical; peristome, external, normal; internal, very short rudimentary processes. On rocks, rivulet behind Cumming's Head.

41. CONOSTOMUM, O. SWARTZ.

Cone mouth, in allusion to the peristome. An Arctic and Antarctic genus, on Alpine mountains. Key, No. 28.

Nerve broad.

1. *C. Australe*, SWARTZ. Stems erect, branched, branches fasciculate; leaves erect, most densely imbricate, linear-lanceolate, acuminate, upper piliferous; nerve broad, excurrent. Capsule nearly globose, inclined. Lid obliquely beaked. Rivulet behind Cumming's Head, Western Mountains.

Nerve narrow.

2. *C. pusillum*, HOOK f. AND WILS. Stout stems. Leaves sub-erect, loosely imbricate, lanceolate-acuminate, sub-piliferous, margin recurved, doubly serrate; capsule inclined, almost cernuous. Key, No. 28. The Falls, and Rivulet behind Cumming's Head.

42. PHYSCOMITRIUM, BRIDEL.

Bladdery calyptra; so named from the inflated dimidiate calyptra. Key, No. 5. On clay banks.

1. *P. apophysatum*, TAYL. Stems very short. Leaves erecto-patent, ovate-acuminate, sub-serrulate, concave, nerve vanishing. Fruitstalk short; capsule erect, clavate pyriform, when dry constricted below the mouth. The Hummocks.
2. *P. laxum*, HOOK f. AND WILS. In loose tufts. Stem robust, leaves lax; from a narrow base spathulate-ovate-acuminate, entire, nerve vanishing below the middle. Fruitstalk $\frac{1}{2}$ in. Capsule ovate. Western Mountains.

3. *P. conicum*, MITT. Similar to *P. pyriforme*, Br. and Schimp, the leaves of which are sub-spathulate, sub-acute, concave, serrulate, nerve nearly continuous. Fruitstalk 2 lines long; capsule pyriform; lid depressed conical. Less than the usual states of *P. pyriforme*, but very similar. Mitt. Leith's Creek.

43. ENTOSTHODON, SCHWÆGR.

Within tooth, so named from the 16 teeth being inserted below the mouth of the capsule. Key, No. 22. Short, loosely tufted, growing in earth, rarely on stones.

1. *E. gracilis*, HOOK. f. AND WILS. Stems very short; leaves erect, sub-elliptic, acute, sub-carinate, concave, quite entire, nerve vanishing. Fruitstalk elongate, twisted to the left. Capsule erect, pyriform from a narrow apophysis, plicate, exannulate; lid almost plain. Key, No. 22. Brown's River, New Norfolk.
2. *E. productus*, MITTEN. Monoicous, small, short; lower leaves ovate, thin, lanceolate, narrow above, quite entire, nerve vanishing below the apex; cells elongate. Fruitstalk two lines long; capsule small, ovoid; lid depressed, convex; peristome 0. On the earth, Western Mountains.

44. FUNARIA, SCHREBER.

From funis, a cord, in allusion to the twisting of the fruitstalk. Tufted, growing on earth, burnt wood, soil, &c. Key, No. 48.

Leaves entire, fruitstalk 1 in. or more in length.

1. *F. hygrometrica*, HEDWG. Leaves broadly ovate-lanceolate, concave, entire, nerve continuous; perigonal serrate at the apex. Capsule incurved, pyriform, mouth wrinkled. Double ring. Lid convex. Fruitstalk more or less arcuate. Grass Tree Hill, Brown's River, Bellerive. Appears almost everywhere on burnt ground.

Leaves serrate, fruitstalk $\frac{3}{4}$ in. or more in length.

2. *F. Tasmanica*, HAMPE AND C. MUELL. Stems $\frac{1}{4}$ to $\frac{1}{2}$ in. long; leaves spreading, ovate, acuminate, sub-piliferous, serrate, nerve vanishing a little above the middle; fruitstalk arcuate; capsule long clavate-pyriform; peristome perfect. Austr. Mosses, F. v. M. T. I. In Tasmania, accompanied by *Targionia Tasmanica*.

Leaves crisped, fruitstalk $\frac{1}{4}$ in. long.

3. *F. crispula*, Hook. f. AND WILS. Leaves patent, when dry loosely crisped, obovate, apiculate, concave, subserrulate, nerve vanishing; fruitstalk short, twisted to the left; capsule globose-pyriform, curved, short neck. Lid almost plain. Peristome double, inner yellow. Key, No. 48. Allied to *F. glabra*, Taylr., but differs in the form of the capsule and in the crisped foliage. On rocks, Sth. Huon, Port Sorell.

Leaves not crisped, fruitstalk $\frac{1}{4}$ in. long.

4. *F. glabra*, TAYL. Stems very short. Leaves erectopatient, obovate, apiculate, serrulate at the apex; nerve vanishing below the apex. Fruitstalk erect, twisted to the left. Capsule clavate-pyriform, curved, gibbous, annulus 0, inner peristome imperfect, lid nearly flat, margin not coloured. Hook. Handbook N.Z. Fl.

45. SPLACHNUM, BR. AND SCHIMP.

The name (*σπλαγχνον*) is borrowed from Dioscorides, and was originally used for some lichen or cryptogamic plant. Key, No. 23. Growing on old wood, earth, and animal matter.

Leaves serrulate.

1. *S. (Dissodon) callophyllum*, C. MUELL. Loosely tufted, tomentose with radicles. Stems very slender, ascending, pale green, flaccid. Leaves loosely imbricate, from a narrow base spathulate-ovate, cuspidate, serrate. Fruitstalk stout; capsule erect, oblong-ovate, small mouth, teeth 8, rising from within the orifice. Lid oblique, obtuse, cuspidate. *Eremodon robustus*, Hook f. and Wils. Fern Tree Valley, Mt. Wellington.

Leaves entire.

2. *P. octoblepharum*, Hook. Leaves obovate, long acuminate, sub-piliferous, quite entire; capsule clavate; teeth 8, in pairs; calyptra naked. *Dissodon plagiopus*, C. Muell. Key, No. 23. Var. *v. majus*; leaves wider. Common on cowdung.

Capsule with oblate apophysis.

3. *S. Gunnii*, HOOK AND WILS. Stems rigid, thick, short, tomentose. Leaves tinged with red. squarrose, obovate or spathulate, acute, concave, dentate, nerve vanishing. Fruitstalk short, thick, red. Capsule conical, with a large oblate apophysis, pale, of firm texture, scarcely altered when dry. Teeth 8, incurved slightly when dry. Calyptra minute, conical, base inflexed, naked. On dead fern trees, Acheron River.

46. BUXBAUMIA, ALBERT VON HALLER.

Named in honour of J. C. Buxbaum, a German botanist. Key, No. 55. Growing on soil or decayed wood.

1. *B. Tasmanica*, MITT. Similar to *B. indusiata*, leaves very small, ciliate. Fruitstalk shining, sub-scabrous. Capsule sub-erect, ovate; upper surface plain, imarginate; lower surface convex. Lid conical. Peristome apparently composed of smooth bladdery cells, scarcely free from the internal membrane. Cheshunt.

47. POLYTRICHUM, LINN.

Many hairs, alluding to the hairy calyptra. Dark green or brown plants, growing on the earth or at the roots of trees. Key, No. 49.

ATRICHUM, calyptra narrow, cucullate, elongate, naked, apex very spinulose. Capsule cylindrical. Lid with slender beak. Leaves lanceolate-ligulate, nerve narrow, sparingly lamillate, sub-flaccid.

1. *P. angustatum*, Hook. Stem slender; leaves elongate, lanceolate, crisped when dry, spinulose-serrate above. Capsule cylindrical, sub-erect; lid with slender beak, calyptra naked. *Atrichum angustatum*, Bryol. Eur., *A. ligulatum*, Mitt. Var. *polysetum*, fruitstalks aggregated. Mt. Wellington, Southport Narrows.

PSILOPILUM, peristome teeth 16-32, very short. Capsule ovate, ventricose. Calyptra hairy at the tip, naked below.
Leaves entire.

2. *P. Australe*, Hook. f. AND WILS. Stems short; leaves crowded, erect and incurved when dry, ovate-subulate, densely lamellate, quite entire. Fruitstalk short; capsule inclined, ovate ventricose, small mouth; lid beaked. Calyptra short, scabrid at the tip. Around Hobart, on stones and on the earth.

Leaves denticulate.

3. *P. crispulum*, Hook. f. AND WILS. Leaves rather flaccid and spreading, crisped when dry, oblong-lanceolate, sub-acute, toothed, incurved, lanceolate. Fruitstalk elongate; capsule inclined, ovoid, small mouth. Lid rostrate. Teeth 32, minute, narrow. Western Mountains.

CYPHOMA. Capsule flat above, gibbous below. Calyptra sub-nude. Teeth 32-64. Leaves acutely serrate, rigid, base sheathing.

4. *P. Magellanicum*, HEDW. Stems branched. Leaves spreading and recurved, rigid, base ovate, sheathing, thence subulate, serrate. Capsule inclined or horizontal, oblong, semiterete. Lid conico-rostrate, calyptra slightly hairy. *Polytrichadelphus Magellanicum*, Mitt. *Catharinaea (Polytrichadelphus) innovans*, C. Muell. Mt. Wellington.

POGONATUM. Calyptra hairy, capsule terete. Lid with long beak.

5. *P. alpinum*, LINN. Leaves spreading and recurved, long linear lanceolate, sheathing at the base, margin incurved, sharply serrate, spinulose at the back, lamellar. Capsule erect or inclined, ovoid or oblong, furnished with a short swollen neck. Lid with a long beak. Calyptra with red-brown hairs, teeth short, sub-irregular. Western Mountains.

6. *P. tortile*, SWARTZ. Stems simple, 1-2in. high, leaves loosely spreading, incurved when dry, sheathing at the base, thence linear-lanceolate, flat, serrate. Fruitstalk 1in. high. Capsule sub-erect, nearly terete, obscurely six-lined; lid convex, with a short beak. Calyptra clothed with matted hairs. *P. subulatum*, Menz. Hook. Handbook N.Z. Fl. Mt. Wellington.

7. *P. Gulliveri*, HAMPE. No description available.

POLYTRICHUM, capsule angular, furnished with discoid apophysis. Lid shortly beaked. Calyptra hairy. Teeth 64. Columella alate.

Leaves serrate.

8. *P. commune*, LINN. Long stems. Leaves sheathing at the base, spreading, recurved, long linear-lanceolate, serrate, lamellate; perichætil, sheathing, membranous, erect. Capsule 4-angled. Lid with short beak. Var. B. Stems short, slender. Bogs, Brown's River. Bogs near Huon.

Leaves entire.

9. *P. juniperinum*, HEDWG. Leaves spreading, recurved, sheathing at the base, linear-lanceolate, aristate, margin inflexed, quite entire. Capsule 4-angled, horizontal; lid beaked. Summit of Mt. Wellington.

48. DAWSONIA, BROWN.

Named in honour of Dawson Turner. Large, handsome mosses, rigid, dark green. Key, No. 41. In forests and on roots of trees.

1. *D. superba*, GREV. Stems very long. Leaves with ovate sheathing base, linear, very long, rigid, spinulose-serrate. Fruitstalk short, thick. Capsule partially hidden by the leaves; peristome of numerous cilia, like a brush; calyptra small, covered with hairs. Emu Bay.

49. LEUCODON, BRIDEL.

The name of the genus (λευκος, white, οδούς, tooth) is not strictly applicable, the peristome usually being pale yellow. Key, No. 61. On rocks and trees.

1. *L. Lagurus*, Hook. Stem and branches covered with matted fibrils. Leaves bright green, glossy, imbricate, oblong-ovate, concave, acuminate, piliferous, not striate, scarcely nerved. Capsule erect, sub-cylindrical, lid obliquely rostrate. *Stereodon Lagurus*, Mitten. Near the top of Mt. Wellington, south side.

50. CLADOMNION, Hook f. AND WILS.

Lateral branching moss, loosely tufted, creeping, with erect, long, slender branches. Key, No. 71.

Capsule sulcate, leaf nerveless.

1. *C. sciuroides*, *Leskea*, Hook. Stems creeping; branches sub-erect; incurved, rather flattened; leaves erecto-patent, sub-secund, ovate, acuminate, plicate, striate, serrate at the apex, nerve 0. Fruitstalk short. Capsule erect, oblong, sulcate. Double peristome, inner a deeply divided membrane, 16 carinate processes. Lid conical-subulate. *Stereodon (Achyrophyllum) sciuroides*. On twigs and trunks of trees in dense woods.

Capsule smooth, leaf nerved.

2. *C. setosum (Ancæctangium)*, HEDWG. The young upright shoots elongate, nearly simple. Leaves crowded, sub-secund from an ovate base, thence subulate-setaceous, serrate, nerve solid. Fruitstalk very short. Capsule erect, smooth, oblong. Lid beaked. *Neckera setosa*, Hook. *Spiredeus*, Mitt. *Pilotrichum*, C. Muell. *Cyrtopus setosus*, Hook. Handbook N.Z. Fl.

51. LESKEA, HEDWG.

Named in memory of Leske, a professor at Leipsic. Key, No. 65.

- L. imbricata*, Hook. f. AND WILS. Monoicous. Stem creeping; young erect shoots vaguely or sparingly branched, branches curved, thickened above. Leaves imbricate, crowded, rotundo-ovate, margin almost plain, strong nerve vanishing under the apex. Moist rocks on Mt. Wellington. Foliage brownish or lurid. This is, perhaps, a young state of *Cryphaea*. Mitt. in Fl. Tasm.

52. METEORIUM, BRIDEL.

That which is suspended in the air, in allusion to the habit of this genus in creeping over trees and stones, pendulons, very long. Key, No. 72.

Leaves oblong-spathulate, obtuse.

1. *M. molle* (*Leskea*), HEDWG. Shoots very long, pendulous, flexuose, flaccid, branches nearly simple. Leaves imbricate, sub-spathulate, elliptic, oblong, obtuse, concave, quite entire, nerve 0. Perichæatial sheathing, double the length of stem leaves. Fruitstalk short. Capsule ovoid. Lid beaked. Calyptra hairy, dimidiate. *Stereodon molle*, Mitt. Var. *B. majus*, branches tumid, fruitstalk longer, capsule unequal. Brown's River.

Leaves cordate ovate, apiculate.

2. *M. cuspidiferum* (*Neckera*), TAYL. Shoots very long, pendulous, flexuose, flaccid; leaves loosely imbricate, erecto-patent, cordate-ovate, semi-amplexicant, apiculate, auricle at base slightly denticulate, elsewhere quite entire, keeled, substriate, nerve vanishing, areolation very minute. *Trachypus Hornschuchii*, Mitt. On trees.

Leaves cordate-ovate, crispato-undulate.

3. *M. cerinum*, Hook. f. AND WILS. Very long, pendulous; leaves, when dry, crisp-undulate, cordate-ovate, acuminate, quite entire, nerve vanishing, auricles nearly entire. *Trachypus cerinum*, Mitt. On trees, in creeks. More robust than *M. cuspidiferum*, leaves yellowish, auricles larger, reflexed when dry.

Filiform. Auricles entire.

4. *M. filipendulum*, Hook. f. AND WILS. Stems long, slender, pendulous, branches spreading, flexuose, simple, very attenuated. Leaves ovate-acuminate, quite entire. On trees.

Very slender. Auricles toothed.

5. *M. flexicaule* (*Leskea*), TAYL. Long, pendulous, flexuous. Leaves loosely imbricate, cordate-ovate or sub-spathulate, acuminate, concave, not striated, quite entire except at the obscurely toothed base. Nerve to the middle. On trees.

53. CRYPHÆA, MOHR.

- Hidden*, in allusion to the concealed capsules. Key, No. 77. Creeping on trees or rocks.

1. *C. consimilis*, MONT. Stems branched, distant, spreading, filiform. Leaves ovate-lanceolate, acuminate, quite entire, margin slightly recurved, nerve nearly continuous, capsule oblong, immersed in piliferous perichæatial leaves. Lid conical, acute. On dead timber, Coal River Tier.
2. *C. parvula*, MITT. *C. consimilis*, not of MONT. Stems creeping. 1-2in. long. Branches and stem leaves as in the preceding species, perichæatial broadly obovate, retuse, suddenly produced into a piliferous acuminate point. Fruitstalk scarcely visible. Capsule ovoid; lid conical, acute. Calyptra, red-brown, rough at the apex. Hook. Handbook N.Z. Fl.
3. *C. Tasmanica*, MITT. Stems frequently naked below, crowded above with many close-set branches. Leaves spreading, orbicular-ovate, acute, margin flat, most minutely serrulate, nerve vanishing below the apex, perichæatial subulate from an ovate base, overtopping the capsule. Lid convex, acute, ring double. On rocks, Jackey's Plain Creek.

54. NECKERA, HEDWG.

Named in commemoration of Necker, a celebrated botanist. On trunks of trees. Key, No. 62.

1. *N. pennata*, HEDWG. Stems pinnate, leaves ovate-lanceolate, acuminate, serrulate, undulate, nerve inconspicuous. Perichæatial, long-lanceolate, acuminate. Capsule immersed, lid shortly beaked, calyptra small, scarcely covering the lid. *N. hymenodonta*, C. Muell. On trees, rivulets, and damp copses, near Launceston.

55. OMALIA, BRIDEL.

Flat, in allusion to the complanate leaves. Key, No. 64. On trunks of trees and on shady rocks.

1. *O. falcifolia*, HOOK. f. AND WILS. Stems sub-pinnately branched, branches complanate, almost simple; leaves distichously imbricated, oblong, broad, flat, falcate, obtuse, nerve 0. quite entire. Fruitstalk smooth. Capsule elliptic-oblong, drooping; lid conical.

56. TRACHYLOMA, BRIDEL.

Rough-edged, in allusion to the nodose teeth of the peristome. Tree-like, flattened, pinnately branched. Key, No. 63.

1. *T. planifolium*, BRIDEL. *Neckera planifolia*, Hook.
Stems erect, pinnately branched, branches complanate; leaves distichously imbricating, erecto-patent, ovate, serrate at the tip, inconspicuous nerve; capsule erect, sub-cylindric, lid conical subulate. Growing 3in. high on dead trees, in forest, Esk River.

57. ISOTHECIUM, BRIDEL.

Equal capsule. Tree-like in form. On rocks and trees.
Key, No. 73.

A. Stems sub-erect, sub-pinnately branched, 1in. high, nerve 0.

1. *I. gracile*, Hook. f. AND WILS. Stems branched, branches recurved. Leaves erecto-patent, elliptic, concave, hardly acute, secund, obscurely toothed, nerve 0; perichætil squarrose, acuminate. Fruitstalk smooth, capsule oblong, cernuous; lid conical. On stones in rivulets.

1in. high, leaf nerved half-way.

2. *I. pumilum*, Hook. f. AND WILS. Stems dendroid, pinnately branched, scaly below, branches complanate. Leaves ovate or ovate-oblong, serrulate, nerve slender, reaching half way to apex; perichætil, sub-squarrose, ovate-ligulate. Fruitstalk short, smooth. Capsule ovoid, cernuous, ringed. Lid beaked. *Neckera rivalis*, Mitt. West End Rivulet and Stackhouse Falls.

Stem 2-3in. long, capsule sub-erect.

3. *I. arbuscula* (*Hookeria*, SMITH). Stems bi-pinnately branched; leaves imbricate spreading, ovate, concave, quite entire, nerves 2, indistinct. Fruitstalk short, flexuose; capsule sub-erect or cernuous; lid conical. Var. *B. deflexum*, stem arcuate, and rooting at the apex. Leaves more acute and less concave. On trees in dense forests.

4. *I. angustatum*, MITT. Very similar to *I. arbuscula*, but smaller in all its parts, 2-3 pinnately divided; leaves spreading, sub-compressed, narrow oblong-ovate, acute, concave, quite entire, those in the branches serrulate above; perichætil, subulate, spreading. Capsule short, ovoid, horizontal. Hook. Handbook N.Z. Fl. Mt. Wellington.

Capsule pendulous.

5. *I. (Porotrichum) fruticosum*, MITTEN. Similar to *I. arbuscula*, but the more acute ovate leaves and the drooping capsule on elongated fruitstalk, sufficiently distinguish it. Mitten's Cat. Austr. Mosses.

B. HYPNODENDRON. Stems dendroidal, rigid

Leaves ovate, acute, serrated.

6. *I. spininervium* (*Hypnum*, Hook. Musc. Exot.)
Branches simple, spreading. Leaves sub-distichously imbricate, ovate, acute, margin and back serrated, nerve solid. Capsule oblong, cernuous, sulcate. Lid rostrate, shorter than the capsule. *Trachyloma arcuata*, Mitt. On the ground and on stones in bed of rivulets.

Leaves ovate-lanceolate, dotted, serrated.

7. *I. Archeri*, MITTEN. Branches disposed as to form a sub-triangular frond. Leaves ovate-lanceolate, acute, nerve percurrent, margin serrate. Cells minutely papillose, punctate; perichætal, ovate, thin, slender, acuminate; capsule horizontal, oblong, sulcate; lid with long curved beak. Teeth normal. On the banks of creeks in forests.

Branches whorled.

8. *I. comosum*, LABILL. In dense tufts, stem tomentose with matted radicles, branches in crowded whorls, sub-erect, leaves rigid, spreading, sub-secund, ovate-lanceolate, with a rigid subulate apex; margin serrate, nerve thick, terete. Fruitstalks numerous, capsule oblong, pendulous, sulcate; lid with long beak. Key, No. 73. Mt. Wellington.

Branches fascicled, lateral, decurved. Nerve keeled.

9. *I. Sieberi* (*Hypnum*, C. MUELL). In loose tufts. Stems robust, tomentose, branched laterally, not whorled, stout, deflexed, sub-cuspidate. Leaves crowded, erecto-patent, narrow lanceolate, gradually acuminate, striate when dry, margin thickened, coarsely serrate, nerve stout, keeled at the back, excurrent. Numerous fruitstalks. Capsule horizontal, sulcate. Lid with long beak. Mt. Wellington.

Branches fascicled, lateral, decurved. Nerve terete, spinulose.

10. *I. Colensoi*, Hook. f. AND WILS. In loose tufts, with habit and ramification of *I. Sieberi*; leaves lax, patent, sub-secund, rigid, cordate, lanceolate at the base, narrowed into a long acuminate setaceous apex; nerve excurrent, stout, punctulate at the back, serrate and spinulose at the point. Capsule pendulous, elongate, cylindrical, 8-grooved, curved; lid with long beak. *Isothecium comatum*, C. Muell.

58. HYPNUM, LINN.

From *ὑπνος*, Sleep. One of the largest genera of mosses, found in all parts of the globe.

In the following groups the arrangement in Fl. Tasm. and Hook. Handbook N.Z. Fl. is followed as closely as possible:—

KEY TO GROUPS.

I. Stems and branches covered with matted radicles amongst the leaves.

A. TAMARISCINA. Leaves small, nerve strong. Fruitstalk smooth.

II. Stems and branches not covered with radicles.

a. Leaves imbricate all round the stem, squarrose, or erect, or incurved, or secund, or falcate, not 2-farious or distichous.

Leaves more or less falcate and secund, often circinnate.

B. ADUNCA. Stem flacid. Lid short, conic.

C. HISPIDA. Stems elongate, rigid. Nerve very strong. Lid beaked.

D. CUPPRESSIFORMIA. Stem flaccid. Nerve 0. Lid beaked.

Leaves spreading, not squarrose, nor large, nor concave.

E. PRÆLONGA. Fruitstalk scabrid. Lid beaked.

F. CONFERTA. Fruitstalk smooth. Lid beaked.

G. RUTABULA. Fruitstalk scabrid. Lid conic.

Leaves squarrose and spreading, large and often concave.

H. STELLATA. Capsule not grooved.

I. PTYCHOMNION. Capsule grooved.

Leaves closely imbricate, not squarrose, large and concave,

J. COCHLEARIFOLIA.

b. Stems compressed. Leaves imbricate. The lateral spreading 2-farioms,

K. DISTICHOPHYLLA.

DISTINCTIVE CHARACTERS OF GROUPS OF HYPNUM.

- A. TAMARASCINA. Stems pinnately or bipinnately branched, covered with matted green fibrillous rootlets. Leaves imbricated all round the stems and branches, not two farious or distichous, nerve stout.
- B. ADUNCA. Leaves falcate, secund ; nerve single, continuous or vanishing below the apex. Fruitstalk smooth. Lid short, conical. Often aquatic or marsh mosses.
- C.—HISPIDA. Stems rigid, stiff, sparingly branched. Leaves falcate and secund, nerve very stout.
- D. CUPRESSIFORMIA. Stems flattened. Leaves more or less secund, falcate or circinnate, imbricate all round the stem or obscurely 2-farious ; cells at the outer base often large. Nerve 0. Fruitstalk smooth (rather rough in *H. cerviculatum*).
- E. PRÆLONGA. Leaves spreading, imbricate all round the stem, not squarrose nor secund, serrulate, nerved half-way. Fruitstalk scabrid, lid beaked.
- F. CONFERTA. Leaves imbricating all round the stem, not squarrose nor secund, usually small and serrulate. Fruitstalk smooth, lid beaked.
- G. RUTABULA. Leaves spreading, imbricate all round the stem, not squarrose, rarely sub-secund. Fruitstalk rough ; lid short, conical.
- H. STELLATA. Leaves imbricated all round the stem, small, spreading, and squarrose. Fruitstalk smooth, capsule not grooved.
- I. ACICULARIA. Stems stout, sub-erect, sparingly branched. Leaves imbricated all round, squarrose, large, very concave, flaccid, serrate, nerveless. Capsule grooved or angled. Calyptra large, inflated.
- J. COCHLEARIFOLIA. Stems stout or slender, prostrate, sometimes pendulous. Leaves imbricated all round, often appressed, not squarrose or secund, very concave and inflated, transparent, obtuse or apiculate ; nerve 0 or obscure. Fruitstalk smooth. Capsule not grooved.
- K. DISTICHOPHYLLA. Stems and branches compressed. Leaves inserted all round the stem, but distichous, nerveless or obscurely nerved.

A. TAMARISCINA.

Stems closely bi-pinnate.

1. *H. furfurosum*, HOOK *f.* AND WILS. Stems elongate, procumbent, scaly, rigid, closely bi-pinnate; branches slender, attenuate; stem leaves squarrose, cordate-acuminate, concave, keeled, plaited, nerve vanishing; those of the branches sub-erect, incurved when dry, ovate-acuminate, apex denticulate, papillate at the back, nerve vanishing; perichætil, narrow, acuminate, denticulate. Fruitstalk smooth; capsule oblong, cernuous; lid beaked. *Leskea hastata* (Hypnum). C. Muell. Near Hobart, on the ground.

Stems distantly bi-pinnate.

2. *H. unguiculatum*, HOOK *f.* AND WILS. Allied to the preceding species, but more slender in habit. Stems about 2in. long, distantly branched. Stem leaves small, not concealing the stem, spreading, cordate-acuminate, distant, sub-plicate, sub-entire; branch leaves distant, much bent inward when dry, but not appressed, ovate-acute, concave, smooth at the back; nerves slender, pellucid, vanishing; perichætil, piliform, acuminate, denticulate. Fruitstalk lin. long, smooth, capsule oblong, arcuate; lid beaked. Teeth yellow, longer than in *H. furfurosum*; inner peristome reddish, with cilia. Near Hobart, on the ground.

Stems scarcely pinnate.

3. *H. Stuartii*, O. MUELL. Very similar to *H. hastata*, but the stems irregularly branched, scarcely pinnate; the larger branches stoloniferous. Perichætil, sheathing, plicate, margin revolute, including very many long paraphyses, nerve excurrent. Capsule pendulous, turgid (swollen), oblong. Teeth, inner, golden, separate, with very short cilia interposed.

Frond of linear outline.

4. *H. fulvastrum*, MITT. Similar to *H. furfurosum*, but branches short and close set, giving a linear outline to the frond. Cauline leaves secund, plaited, those of the branches and branchlets evenly disposed on every side; perichætil, much ciliate. Hook. Handbook. N.Z. Fl. On the ground, Bellerive.

Leaf with long flexuous, slender point, scarcely serrulate.

5. *H. læviusculum*, MITT. Very similar to *H. tamariscinum*. Leaves of the stem with flexuous points, nerve thick, excurrent; perichætil erect, pale, ovate-lanceolate, much attenuated, flexuous, sub-serrulate. *Leskea læviuscula*, Mitt. Mt. Wellington.

B. ADUNCA.

6. *H. fluitans*, LINN. Monoicous. Stem sub-pinnately branched, thin, flaccid. Stem leaves remote. Branch leaves falcate-secund, lanceolate, acuminate, nerve vanishing. Fruitstalk long, capsule oblong, arcuate, cernuous, lid sub-conical. In wet places, Yorktown.

C. HISPIDA.

7. *H. hispidum*, HOOK. f. AND WILS. Stems long, arcuate, vaguely or sub-pinnately branched; leaves imbricate, rigid, secund, ovate below, somewhat plaited, long subulate, setaceous, quite entire, nerve stout, excurrent. Fruitstalk rather short, smooth. Capsule ovoid, cernuous. Lid with a curved beak. *Leskea hispida*, Mitt, *H. aristatum*, Sullivant. Stones, in running water, Back River Creek.

D. CUPRESSIFORMIA.

I. Lid as long as the capsule.

* Leaves strongly falcate or circinnate.

<i>H. cerviculatum</i>	...	...	...	8
<i>H. tenuirostre</i>	...	...	...	9
<i>H. amœnum</i>	...	...	...	10

** Leaves slightly falcate.

a. Leaves quite entire or obscurely serrulate.

<i>H. contiguum</i>	...	...	...	11
<i>H. Joliffii</i>	...	...	...	12
<i>H. homomallum</i>	...	...	...	13

b. Leaves distinctly serrulate.

<i>H. leptorynchum</i>	...	...	...	14
<i>H. cyparioides</i>	...	...	...	15

II. Lid shorter than the capsule.

Leaves strongly falcate, ovate-lanceolate, nerveless.

<i>H. chrysogaster</i>	...	...	...	16
<i>H. cupressiforme</i>	...	...	...	17
<i>H. limatum</i>	...	...	...	18

8. *H. cerviculatum*, HOOK. f. AND WILS. Stems creeping, sub-pinnately branched. Leaves falcate-secund, lanceolate-acuminate, apex attenuated, serrated, margin scarcely reflexed, nerve 0. Perichætil erect, ovate-lanceolate, apiculate, serrate. Fruitstalk short, stout, roughish. Capsule oblong, horizontal, strumose base, no ring. Lid with long beak. *H. leptorynchum*. Var. B. Fl. Antarct. *Stereodon cerviculatus*, Mitt. On trees around Hobart.

9. *H. tenuirostre*, Hook. Stems creeping, sub-pinnately branched; branches elongate, erect; leaves crowded, falcate, secund, ovate-lanceolate, acuminate, concave, almost entire, nerve 0. Capsule ovoid-oblong, cernuous. Lid with long beak. *Hypnum Terræ Novæ*. Var. B. Fl. Antarct. Mt. Wellington.
10. *H. amœnum*, Hedwg. Stems prostrate, vaguely and pinnately branched, 1-2 in. long; branches short, their apices incurved. Leaves yellow-brown, shining, falcate and secund, lanceolate, long acuminate, concave; quite entire; cells large, pellucid at the marginal base, nerves 0; perichætil broader, entire or serrulate towards the apex. Fruitstalk $\frac{1}{2}$ to $\frac{3}{4}$ in. long, very slender, red. Capsule horizontal, ovoid, urceolate when dry; lid with a slender beak as long as the capsule. Hook. Handbook Fl. N.Z. Mt. Wellington, Bellerive.
11. *H. contiguum*, Hook. f. AND WILS. Stems sub-pinnately branched, apices of the branches sub-cuspidate. Leaves loosely imbricate, sub-sekund, not falcate, lanceolate, acuminate, piliferous, quite entire, slightly concave, cells at the marginal base inflated, perichætil longer, erect. Fruitstalk short, smooth. Capsule ovoid-oblong, pendulous; lid with long beak. Trunks of trees, Mt. Wellington.
12. *H. Joliffii*, MITT. Branches with cuspidate apices; leaves loosely imbricate, oblong-acuminate, concave, obscurely 2-nerved or nerve 0, quite entire or subserrulate at the apex, cells at the marginal base larger and hyaline; perichætil similar, erecto-patent. Fruitstalk slender, capsule small, ovoid, horizontal or inclined; lid with beak as long as the capsule; peristome, inner, solid ciliary processes 2-5 exerted from a membrane, ring simple. On stones and earth, Western Creek, Cheshunt.
13. *H. homomallum*, C. MUELL. Leaves purplish or golden brown, glossy, erecto-patent secund, broadly ovate-acuminate, cochleariform-concave, quite entire, nerve 0, margin recurved, marginal cells at the base, square; perichætil straight, narrow. Fruitstalk short, smooth. Capsule oblong, sub-cernuous, curved. Lid with long beak. *Leskea homomalla*, Hampe. *H. Drummondii*, Tayl. On rocks, not uncommon. On rocks facing the sea at Eaglehawk Neck.

14. *H. leptorynchum*, BRIDEL. Stems creeping, sub-pinnately branched; leaves falcate, secund, linear-lanceolate, acuminate, serrulate at the apex, margin sub-recurved, nerve 0, twisted when dry. Fruitstalk slender, smooth; capsule oblong, drooping; lid with long beak. *Stereodon cyparioides*, Mitt. Near Hobart, on trees.
15. *H. cyparioides*, BRIDEL. Very similar to the preceding species; leaves sub-distichous, shorter; perichætil narrower, gradually acuminate; fruitstalk shorter, more slender, arcuate at the apex; capsule minute, ovoid, pendulous, constricted under the mouth. Southport, with the preceding.
16. *H. patale*, HOOK f. AND WILS. *Steredon chrysogaster* (*Hypnum*), C. Muell. *H. chrysogaster*, Hook. Handbook. *H. cupressiforme*, Fl. Antarct. Stems procumbent, pectinately (divided or branched like a comb) branched, branches crowded, spreading, flattened above. Leaves falcate, secund, ovate-lanceolate, acuminate, distichously spreading, apex sub-serrulate, nerve 0, pale green, glossy, yellowish at the base. Perichætil, erect, acuminate, setaceous, serrate. Fruitstalk long. Capsule horizontal, ovoid-oblong. Lid conical, apiculate. On trees, slopes of Mt. Wellington.
17. *H. cupressiforme*, LINN. Stems vaguely and pinnately branched; branches incurved. Leaves falcate-secund, ovate-lanceolate, concave, nerve 0, cells at the marginal base opaque, square. Capsule sub-cylindric, sub-cernuous. Lid conical, cuspidate. Var. *B. minus*, branches slender, leaves narrower. Moist rocks, Mt. Wellington.
18. *H. limatum*, HOOK f. AND WILS. Dioicous. Stems sub-pinnately branched, branches simple, incurved. Leaves secund or falcate, ovate-lanceolate, sub-piliferous, sub-entire, nerve 0. Perichætil, long, recurved, sub-piliferous, sub-serrulate. Capsule cylindrical, sub-erect, lid short, conical, apiculate. *Hypnum Terræ Novæ*. Var. *B. Australi*, Hook. Fl. Antarct. Var. Leaves less, falcate-secund, scarcely-piliferous, perichætil narrower, fruitstalk longer, capsule arcuate. Damp Gullies, Brown's River.

E. PRÆLONGA.

19. *H. muriculatum*, Hook. f. AND WILS. Monoicous. Stems small, sub-pinnately branched. Branches short, simple, sub-compressed. Leaves spreading, cordate, ovate, acuminate, sub-serrulate, apices sub-piliferous, attenuate, nerved beyond the middle. Fruitstalk rough. Capsule oblong, horizontal. Lid, long beak. Circular Head, Hobart.
20. *H. austrinum*, Hook. f. AND WILS. Monoicous. Stems creeping, vaguely branched. Branches sub-erect, almost simple, incurved. Leaves spreading, sub-secund, ovate-cordate, acute, concave, serrulate, nerved beyond the middle. Perichætil erect, attenuate. Fruitstalk rough. Capsule ovoid, cernuous. Lid beaked. Wet places, Back River Gully.
21. *H. asperipes*, MITT. Monoicous. Stems procumbent, branches pinnate. Leaves spreading, ovate, acuminate, serrulate, nerve slender, vanishing near the middle. Fruitstalk rough, lin. high. Capsule oval-oblong, horizontal. Lid with long beak. Cheshunt.

F. CONFERTA.

22. *H. collatum*, Hook. f. AND WILS. *H. confertum*, Fl. N.Z. *H. tenuifolium*, Hedwg. Monoicous. Stems procumbent, pinnately branched. Branches robust, compressed. Leaves spreading, broadly ovate, acuminate, concave, serrulate, nerve slender, vanishing near the middle, areolation very narrow, linear. Perichætil, long acuminate, recurved. Fruitstalk smooth. Capsule cernuous, oblong, curved. Lid with long beak. Var. β , *laxifolium*. Stems longer, branches longer, leaves distant, fruitstalk longer. Var. γ *minus*, stems erect, slender, sparingly branched, branches erect, nerve slender, scarcely compressed, leaves erecto-patent. Var. δ , capsule inclined, symmetrical. On decayed wood in damp, shady places. Var. β , Back River Gully. Var. γ , at the foot of trees. Coal River Tier.
23. *H. aristatum*, Hook. f. AND WILS. Monoicous. Stems pinnately branched; branches slender, attenuate. Leaves spreading, sub-compressed, lax and flexuous when dry, oblong-acuminate, piliferous at the apex, concave, serrulate, margin not reflexed; perichætil, erect, acuminate. Fruitstalk smooth. Capsule cernuous, arcuate, oblong. Lid with short beak. Growing with *H. collatum*, Cheshunt.

G. RUTABULA.

24. *H. rutabulum*, LINN. Monoicous. Stems vaguely branched. Leaves loosely imbricate, spreading, ovate-acuminate, serrulate, nerved beyond the middle, striate when dry. Fruitstalk rough. Capsule ovoid, cernuous, lid conical. Var. 2. Flowers synoicous. Swamps on Mt. Wellington.
- 25 *H. campestre*, (*Brachythecium*, BR.) Monoicous, long, loosely tufty. Long stem prostrate or ascending, much branched; branches ascending, flexuous, sub-pinnate. Leaves crowded, erecto-patent, long, ovate-lanceolate, short or long subulate-acuminate, striate, margin serrate, shining; perichætil, long, subulate, subulate part recurved. Fruitstalk rough. Capsule ovoid, oblong cylindrical, cernuous, curved. Lid conical. Longford.
26. *H. paradoxum*, HOOK f. AND WILS. Stems creeping, sub-pinnate. Leaves falcate and secund, ovate, lanceolate, acuminate, striate, serrulate, nerve interrupted. Fruitstalk rough; capsule ovate-oblong, cernuous. Cheshunt.

H. STELLATA.

27. *H. decussatum*, HOOK. f. AND WILS. Dioicous. Stems procumbent, pinnately branched; branches simple; leaves spreading, squarrose, recurved, ovate, long acuminate, almost entire, nerve nearly continuous, reddish or tawny. Fruit unknown. Bog, New Norfolk.
28. *H. oblongifolium*, HAMPE. No description available.

I. ACICULARIA, PTYCHOMNION.

29. *H. aciculare*, LABILL. Dioicous. Stems vaguely branched; branches stout, long, simple. Leaves spreading and squarrose, ovate, long acuminate, apex serrate, nerve 0. Capsule sub-cylindric, curved, furrowed. Lid with long beak. Very common, on the earth, in woods.

J. COCHLEARIFOLIA.

30. *H. cochlearifolium*, SCHWÆGR. Dioicous. Stems long, vaguely branched. Branches stout, erect, simple. Leaves spreading, imbricate, sub-rotund, obtuse, concave, almost hemispherical, quite entire, nerve 0. Perichætil sheathing. Capsule ovoid, sub-cernuous; lid conical. *Hypnum flexile*, Hook. Musc. Exot. *Isothecium flexile*, Bridel. Key, No. 74. Common in woods.

31. *H. clandestinum*, Hook. f. AND WILS. Monoicous. Male flowers amongst the leaves of the fertile stem. Stem creeping, vaguely branched straight or incurved. Leaves spreading, imbricate, broadly oblong, very obtuse, inflate-concave, like a boat, scarcely nerved. Perichæatial sub-squarrose; capsule ovoid, cernuous; lid conical. On moist trunks of trees, Mt. Wellington.
32. *H. divulgum*, Hook. f. AND WILS. Dioicous. Stem long, filiform, vaguely branched; branches rigid, sub-erect, curved or straight. Leaves spreading, loosely imbricate, rounded obovate, concave, obtuse or sub-acute, minutely serrulate, nerve reaching half way, areolation punctiform; perichæatial squarrose. Capsule ovoid, cernuous. Lid conical, acuminate. Shady places; gully, foot of Grass Tree Hill.
33. *H. chlamydophyllum*, Hook. f. AND WILS. Monoicous. Stems prostrate, vaguely branched. Branches long, erect, simple, cuspidate. Leaves spreading, imbricate, orbicular-sub-quadrate, auricled, sub-pellucid at the base, concave, quite entire, nerve vanishing, very short. Fruitstalk long; capsule ovoid-oblong, cernuous; lid conical. *H. auriculatum*, Mont. On moist banks. Mt. Wellington.
34. *H. vagum*, HORNSCH. Stems ascending, stout, much vaguely branched. Leaves broadly ovate, shortly acuminate, almost nerveless; perichæatial long, sheathing, more or less reflexed. Fruitstalk elongate, erect, smooth, flexuous. Capsule oblong, nearly horizontal, purple; lid conical, subulate, straight. Hook. Handbook N.Z. Fl.

K. DISTICHOPHYLLA.

35. *H. extenuatum*, BRIDEL. Dioicous. Stems procumbent. 3in. long or more. Irregularly and bipinnately branched, with short erect branches, often fasciculate, with numerous flagelliform branchlets; leaves yellowish, somewhat glossy, spreading, ovate-lanceolate, acuminate, piliferous, nerve 0; those of the upper branches appressed, narrower, muticous; perichæatial erect, quite entire, apices capillary. Fruitstalk long, smooth. Capsule ovoid, inclined. Leaves less piliferous than *H. crinitum*. Mt. Wellington.

36. *H. crinitum*, Hook. f. AND WILS. Dioicous. Stems long, procumbent, irregularly and pinnately branched. Branches distant, flattened, acute. Leaves erecto-patent, sub-compressed, concave, ovate-oblong, obtuse, long piliferous, sub-serrulate, nerve 0. Fruitstalk long, smooth. Capsule ovoid, cernuous; lid conical. On trunks of live trees, near Springs, Mt. Wellington.

37. *H. politum*, Hook. f. AND WILS. Dioicous, vaguely branched. Branches long, procumbent, compressed. Leaves bright green, shining, imbricate, distichous, compressed, oblong, keeled, sub-piliferous, quite entire, nerve 0. Fruitstalk long, smooth. Capsule oblong, horizontal; lid conical, beaked. *Phyllogonium callichroum*, Mont. Key, No. 69. Damp places, Mt. Wellington.

38. *H. denticulatum*, LINN. Monoicous. Stems prostrate, sparingly branched. Leaves complanate, obliquely-ovate, sub-acute, quite entire, margin recurved below, nerves 2, short, basal. Capsule sub-cylindric, inclined. Lid conical, acute. English name: Sharp flat-leaved feather moss.

59. RHIZOGONIUM, BRIDEL.

Angle rooted, so named from the manner in which the stems rise erect from the creeping rhizome. Key, No. 66 and 75.

A. Leaves distichous.

Nerve vanishing.

1. *R. distichum*, BRIDEL. Dioicous. Leaves distichous, ovate-oblong, apices dentate, nerve stout, vanishing below the apex; capsule oblong, horizontal; lid conical, rostellate. *R. Muelleri*, Hampe. *Hypnum distichum* Schwægr. Mt. Wellington, Leith's Creek.

Nerve excurrent.

2. *R. Novæ-Hollandiæ*, BRIDEL. Dioicous. Leaves yellowish-green, distichous, slightly thickened at the margin, oblong-ovate, denticulate, nerve excurrent; capsule oblong, horizontal; lid beaked, nearly as long as the capsule. *Leskea Novæ-Hollandiæ*, Schwægr. Var., leaves secund. On rotten trunks of trees near Springs, Mt. Wellington.

Doubly serrate.

3. *R. bifarium*, SCHIMPER. Dioicous. Stems branched above; leaves distant, distichous, spreading, ovate-lanceolate, slightly thickened at the margin; nerve solid, doubly spinulose-serrate; capsule ovoid, horizontal; lid conico-acuminate, sub-rostellate. *Hypnum bifarium*, Hook. *Isotheciun bifarium*, Bridel. Bearing fruit midway, not at the base. Branches few, slender, curved to one side. Rachis zig-zag. Leaves dull green. Setæ $\frac{1}{2}$ in. long; capsule small, roundish.

4. *R. aristatum*, MITT. CAT. No description available.

B. Leaves not distichous.

Leaves pellucid.

5. *R. pellucidum* (*R. reticulatum*, Mitt. Sth. A.M.), Hook. f. AND WILS. Branches 1 in. high; leaves compressed, green, pellucid, unchanged when dry, laterally spreading, elongate-lanceolate, slenderly acuminate, nerve percurrent, apices serrulate, cells elliptic-oblong, lax, pellucid, perichætil narrow.

Leaves linear-subulate.

6. *R. spiniforme*, HEDWG. Monoicous. Leaves loosely imbricate, spreading, rigid, linear-subulate, margin thickened, nerve excurrent, doubly serrate. Fruit-stalk elongate from the base; capsule oblong, horizontal, curved; lid rostrate. *Hypnum spiniforme*, Linn. Mt. Wellington.

Leaves linear-lanceolate.

7. *R. sub-basilare*, SCHIMPER. Monoicous. Branches erect. Leaves erecto-patent, sub-secund, not compressed, lax, linear-lanceolate, pellucid, nerve vanishing, spinulose serrate, rarely double serrate; fruitstalk long, sub-basilar; capsule sub-cylindric, horizontal, lid conical. *Hypnum sub-basilare*, Hook. M.E. *H. mnioides*, Schwægr. Mt. Wellington.

Leaves twisted when dry.

8. *R. mnioides* (*Hypnum*, BRIDEL.) Dioicous. Leaves erecto-patent, lanceolate-subulate, decurrent at the base, twisted when dry, margin narrowly thickened, doubly dentate, nerve solid; fruitstalk long from the base; capsule ovoid, sub-cernuous; lid rostrate. *Hypnum mnioides*, Hook. M.E. *H. sub-basilare*, Schwægr. Var. β . *contortum*, stem more slender, leaves shorter, twisted when dry, margin involute, perichætil long, linear, acuminate. Mt. Wellington. Var. γ . *lutesceus*, stems lower, leaves lanceolate, crisped, areolation larger. Western Mountains.

60. HYMENODON, Hook. f. AND WILS.

Membranaceous tooth, alluding to the narrow basal membrane uniting the teeth of the peristome. Key, No. 57. On trunks of trees and on the ground.

1. *H. pilifer*, Hook. f. AND WILS. Dioicous. Leaves laxly and distichously imbricate, spreading, elliptic-oblong, flat, long piliferous, crenulate, nerve vanishing; perichætil lanceolate-acuminate, erect. Fruitstalk long and slender, basilar. Capsule inclined, oval, contracted at the mouth; peristome simple, teeth 16, membranaceous, equi-distant, linear-subulate, fugacious, tips cohering. Lid beaked. Calyptra dimidiate. Habit as *Rhizogonium*. On trunks of tree ferns, banks of Huon River.

61. HYPOPTERYGIUM, BRIDEL.

The name refers to the fruitstalk being produced under the leaves. Key, Nos. 60, 67, and 80.

1. *H. Smithianum*, Hook. f. AND WILS. Dioicous. Stems bipinnately branched, naked below. Leaves distichous, orbicular-ovate, apiculate, rather concave, margin decurved, nerve vanishing, apex denticulate; dorsal orbicular, acuminate, with a stout nerve; capsule pendulous; lid rostrate. *H. Novæ Zealandiæ*, C. Muell. *Hookeria rotulata*, Smith. The leaves are arranged in a deltoid form. Mt. Wellington. Var. Leaves crisped when dry, dorsal oblong, fruitstalk more slender, more arcuate.
2. *H. glaucum*, SULLIVANT. A very small species; stems tufted, $\frac{1}{4}$ in. high; branches forming a nearly orbicular crown, pale glaucous yellow-green, decurved. Leaves closely imbricate, very deflexed, broadly ovate-acuminate or apiculate, obscurely serrulate; nerve produced half-way or more; dorsal large, compared with others, orbicular, acuminate, with the nerve continuous. Fruitstalk stout, arcuate. Capsule ovoid, cernuous; lid with a slender beak, nearly as long as the capsule. Hook Handbook N.Z. Fl.

62. LOPIDIUM, BRIDEL.

A *scale*, referring to the rough fruitstalk. Key No. 68. In damp forests.

1. *L. pallens*, Hook. f. AND WILS. Monoicous. Stems erect, bipinnately branched, naked below; leaves bifarious, ovate-oblong, shortly acuminate, margin thickened, toothed at the apex, twisted when dry; dorsal cordate, acuminate; perichætil shorter. Fruit-stalk slender, long, rough. Capsule horizontal, ringed. Lid rostrate. Teeth thickly trabeculated. *Leskea concinna*, Schwægr. *Hypopterygium Struthiopteris*, Bridel. On trunks of tree ferns, Huon River. Distinguished from *L. concinna*, Hook. M. E., by the inflorescence and by the rough fruitstalk.

63. CATHAROMNION, BRIDEL.

Neat moss. The leaves are pale green and hoary from the long cilia. Fruitstalk $\frac{1}{4}$ in. long. Key No. 59. In damp forests, on the ground.

1. *C. ciliatum*, Hook. f. AND WILS. Dioicous. Stems pinnately branched, naked below. Leaves bifarious, orbicular-ovate, with long cilia, nerve vanishing; dorsal much smaller, ovate-lanceolate, acuminate, ciliate, mixed with setæ. Fruitstalk very short, stout. Capsule oblong, nearly erect. Lid beaked. Calyptra conico-mitriform, base torn. *Pterigynandrum ciliatum*, Hedwg. *Hypopterygium ciliatum*, Bridel.

64. CYATHOPHORUM, BRIDEL.

Bearing a cup, alluding to the exertion of the short fruit-stalk from a minute cup on the stem. Key No. 78. On fallen tree ferns, in gullies, Mt. Wellington.

1. *C. pennatum*, BRIDEL. Dioicous. Stems erect, very flat. Leaves distichous, ovate-oblong, oblique, serrate; nerve short; dorsal orbicular, apiculate. Fruitstalk very short, curved. Capsule ovoid. Lid conico-acuminate. *Hookeria pennata*, Hook. M. E. Var. *β. minus*, leaves distant, acute. In gullies, Mount Wellington.

65. RACOPILUM, PALISOT.

Rachis hairy, alluding to the stem being more or less tomentose, with brown radicles. Key Nos. 76-79. Creeping on wood, rock, on the ground.

Leaves acuminate.

1. *R. Australe*, Hook. f. AND WILS. Dioicous. Stems creeping, tomentose with radicles, sub-pinnately branched. Leaves crisped when dry, lateral distichous, spreading, oblong-ovate; long pellucid excurrent nerve, apex serrulate. Fruitstalk stout. Capsule oblong, decurved, strumose, cernuous, sulcate. Lid shortly beaked. Calyptra hairy, inflated at the base. *R. strumiferum*, C. Muell. Johnny's Creek, Cheshunt.

Leaves obtuse.

2. *R. cristatum*, Hook. f. AND WILS. Monoicous. Stems creeping. Leaves lateral distichous, spreading, crisped when dry, ovate-oblong, obtuse, serrulate at the apex, nerve excurrent in a point; dorsal much smaller, ovate-cordate, acuminate. Fruitstalk slender; capsule curved, grooved. Lid with short beak. Calyptra dimidiate, subulate, scarcely pilose. Teeth scabrid at the back. *R. tomentosum*, C. Muell. Huon River, on the ground; Kangaroo Bottom; St. Patrick's River.

66. HOOKERIA, SIR J. E. SMITH, founder of the Linnæan Society, London.

Named in honour of Sir William Jackson Hooker. Key No. 81. On fallen trees and banks by streams.

A. SAULOMA, Hook f. and Wils. Leaves sub-secund, not margined; cells large, lax. Outer teeth remotely barred at the back; inner keeled, without interposed cilia. Calyptra naked, inflexed at the base, not fimbriate.

1. *H. tenella*, Hook. f. AND WILS. Dioicous. Stems short, sparingly branched. Leaves crowded, imbricate, sub-erect, secund, ovate-oblong, acute, margin recurved, nerve 0, cells lax, pellucid, when dry plicato-striate. Capsule sub-cernuous, small, ovoid. Lid beaked. Calyptra naked, mitriform. Near Springs, Mt. Wellington.

B. MNIADELPHUS, C. Muell. Calyptra conico-mitriform, base fimbriated. Inner peristome without cilia. Leaves margined or not, nerved or not.

* Leaves with thickened margins.

Leaves serrulate.

2. *H. apiculata*, Hook. f. AND WILS. Dioicous. Leaves orbicular, apiculate, margin thickened, cells large, nerve 0. Fruitstalk rough, capsule cernuous, calyptra hairy, fimbriate at the base. Circular Head.

Leaves entire, cells small.

3. *H. crispula*, HOOK *f.* AND WILS. Dioicous. Branches flattened. Leaves lax and distichous, spreading, when dry crisped and undulate, obovate, apiculate, margin thickened, quite entire, nerved half way, areolation small, nearly round; perichætical ovate-acuminate. Fruitstalk slender. Capsule horizontal, narrow-oblong, pale; lid with a slender straight beak, nearly as long as the capsule. Calyptra fimbriate at the base. Leith's Creek, Cheshunt.

Capsule apophysate.

4. *H. pulchella*, HOOK. *f.* AND WILS. Dioicous. Branches soft, flattened. Leaves crowded, distichous, imbricate, undulate, obovate, obtuse, mucronulate, margin thickened, quite entire, nerved half way; perichætical obtuse; capsule inclined, apophysate. Lid beaked; calyptra fimbriate, apex glabrous. Rivulet near Cuming's Head, Western Mountains.

Leaves not apiculate, margin reflexed.

5. *H. amblyophylla*, HOOK. *f.* AND WILS. Dioicous. Branches stout, compressed. Leaves crowded, distichous, erecto-patent, appressed when dry, obovate, very obtuse, margin thickened, quite entire, nerve vanishing, margin recurved, perichætical obtuse, calyptra fimbriate. Springs, Mt. Wellington.

Leaves yellowish, crisped when dry.

6. *H. sinuosa*, HOOK. *f.* AND WILS. Dioicous. Branches compressed. Leaves obovate, obtuse, margins thickened, nerve vanishing, entire, when dry undulate, crisped. Closely allied to the preceding species, leaves yellowish of firmer texture, areolæ smaller, except at the base, near the nerve, where they are larger, lax, and pellucid. Perichætical small, obtuse. Fruitstalk lin., smooth, glossy, red, strong. Calyptra densely fringed, apex roughish. Arthur's Lakes.

** Leaves without thickened margins.

7. *H. microcarpa* (*Hypnum*, HEDWG.) Dioicous. Stems vaguely branched, branches compressed. Leaves distichous, imbricate, obovate, obtuse, margin not thickened, quite entire, areolation lax and pellucid from the base to the middle; perichætical minute, ovate-lanceolate. Capsule small, cernuous or erect, ovoid. Lid rostellate; calyptra fimbriate at the base. Grass Tree Hill, in wet places.

C. PTERIGOPHYLLUM, Bridel. Calyptra not fimbriate at the base, more or less laciniate. External teeth remotely barred. Leaves flattened, not margined, obtuse, areolation lax. Nerve forked, vanishing.

Leaves blackish, capsule oblong,

8. *H. denticulata*, Hook. f. AND WILS. Stems sub-erect, sparingly branched, lin. high. Branches compressed, sub-incurved, rigid when dry. Leaves shining, pale green when fresh, opaque black, crisped and fragile when dry, loosely sub-4-fariously imbricate, lateral distichous, oblong, ovate or obovate, obtuse or sub-acute, margin toothed, not thickened; dorsal orbicular; nerve short, vanishing, 2-fid, cells large, hexagonal; perichætil small, ovate. Fruitstalk $\frac{1}{2}$ in. long, stout, red. Capsule cernuous or pendulous, oblong, narrowed at the base; lid short, beaked. Calyptra glabrous, coriaceous, not fimbriate at the base. Inflorescence dioicous. Hook Handbook N.Z. Fl.

Leaves brownish, capsule sub-pyriform.

9. *H. nigella*, Hook. f. AND WILS. Dioicous. Stems short, erect, incurved, sparingly branched. Leaves lurid, shrinking when dry, rather remote, flattened, spathulate, obovate, dentate, nerved to the middle; perichætil rotundo-ovate, concave, forming a bulb; capsule sub-pyriform, pendulous; rostrate lid nearly as long, calyptra sub-conical, naked. Teeth with two rather rigid, red, dorsal ridges.

10. *H. obscurum*, MITTEN. Plants 2-3 in. in width, sparingly branched; leaves 3 lines long, distichous, compressed; lateral spreading, wide elliptic-spathulate, narrowed towards the base; intermedial spreading, sub-trapezoidal, obtuse; nerved to the middle, nerve bifurcate, upper margins crenulate-serrate. Cells of the upper part $\frac{1}{800}$ in. in diameter. Whole plant obscure, blackish-green. Cheshunt.

67. DALTONIA, HOOKER AND TAYLOR.

Named in honour of the Rev. James Dalton, a cryptogamic botanist. Key No. 82. On moist, shady rocks, and on the stems and branches of trees in mountainous districts.

1. *D. pusilla*, Hook. f. AND WILS. Monoicous. Stem short, decumbent, nearly simple. Leaves spreading, more or less secund, loosely crisp when dry, narrow lanceolate, acuminate, quite entire, margined, nerve vanishing. Fruitstalk short, slender, slightly rough at apex. Capsule inclined, oblong, base attenuate. Teeth and cilia very long, very narrow, papillate. Stem 2 lines long. Seta 2 lines long. Peristome half as long as the capsule, or more, widely spreading and recurved when wet. Teeth reddish-brown, distantly trabeculate. Calyptra fringed at the base. Near Springs, Mt. Wellington.

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