

TASMANIAN BRYOPHYTA, Part III.*

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(Read 13th October, 1913.)

Fam. 7—BRYACEAE.

Habit erect or suberect, simple, new branches springing from the base or in pairs from close below the inflorescence. Leaves in many rows, ovate, lanceolate or subulate, nerved, often dentate and limbate at the margin, smooth surface, cells rather large rhomboid or hexagonal to nearly linear. Capsule on a long seta, globose, ovate, or pyriform, usually cernuous or pendulous; lid conic or shortly rostrate; calyptra small, cucullate, smooth, narrow; peristome in the most advanced forms of two well-formed series; the exostome of 16 lanceolate, cartilaginous teeth, formed of a double row of short cells with a zig-zag suture in the centre on the exterior surface, trabecules on the inner; endostome with a deep membrane and 16 slender, porous processes, two or three slender cilia between the processes. From this all states of reduction may be met with till both series are reduced to a rudimentary condition.

A natural family most easily recognised by the cell structure. Also in the more typical forms by the pendulous pyriform capsule with perfect peristome, besides the habit of innovations obscuring the terminal insertion of the seta.

Peristome poorly developed.

MIELICHHOFERIA. Exostome rudimentary; endostome of 16 slender processes from a short membrane. Leaves lanceolate.

ORTHODONTIUM. Exostome of 16 very short lanceolate teeth; endostome of 16 short, slender processes. Leaves narrow linear.

Peristome well developed. Fruiting terminal.

MNIOBRYUM. Cells long-rhomboid. Leaves ovate-lanceolate. Capsule short and broad.

POHLIA. Cells linear. Leaves ovate-lanceolate. Capsule oblong.

LEPTOBRYUM. Cells nearly linear. Leaves long-linear. Capsule pyriform with a slender neck.

* Parts I. and II. of this revision of the *Bryophyta* of Tasmania were published in these *Papers and Proceedings*, 1912, pp. 3-24 (Part I.), 87-133 (Part II.). The present part completes the Mosses; the Hepatics will be included in a subsequent part. No new species are proposed.

Peristome well developed. Fruit from below innovations.

BRACHYMENIUM. Endostome an erose membrane.

BRYUM. Endostome with processes and cilia.

MIELICHHOFERIA Hornsch.

Small, tufted, suberect, sparsely branched, fruit on a short lateral branch placed low down on the stem. Leaves lanceolate, small; nerve bold, vanishing above; cells linear, thin walled. Seta long; capsule horizontal, clavate-pyriform, often gibbous on the lower margin so as to curve the capsule upwards, mouth small; lid short, convex; calyptra cylindric; exostome reduced to 16 convex protuberances; endostome of 16 erect, slender, rather long processes arising from a short membrane.

Mielichhoferia Echloni Hornsch.

Stems slender, mostly under 1 cm. Leaves pale green, erecto-patent, broadly lanceolate, acute, imbricate, about 1mm.; margin serrate above; nerve broad below, narrow above and vanishing below the apex. Seta 1cm.; capsule horizontal, nearly cylindric to gibbous on the lower margin, 2-4 mm.

Knocklofty. Colebrook.

ORTHODONTIUM Schw.

Small, tufted, erect, simple or with innovations below the seta. Leaves linear with a flat slender nerve, cells large lax, linear, thin walled, becoming rather hexagonal towards the tip, very long in the lower part. Seta slender, long; capsule erect or nearly so, clavate-oblong, mouth narrow; exostome of 16 short, lanceolate teeth; endostome of 16 short, slender cilia; lid shortly rostrate, oblique; calyptra cucullate.

Small mosses with a superficial resemblance to *Weissia*.

Capsule sulcate.

Capsule oblong *australe*

Capsule fusiform... .. *sulcatum*

Capsule plain.

Capsule narrow oblong *lineare*

Capsule pyriform... .. *lanceolatum*

Orthodontium australe H.f. et W.

Small, erect, in dense or loose mats; stems about 5 mm. Leaves erect, linear, 3-6 mm., acute; nerve lost a little be-

1913.

low the apex. Seta 1-3 cm.; capsule narrow-oblong, with a tapering base, 2-3 mm., slightly oblique. Exostome teeth slender, erect; endostome processes slender, slightly longer.

Slopes of Mt. Wellington, Eaglehawk, etc.

Orthodontium sulcatum H.f. et W.

Habit of the last. Leaves erecto-patent, linear, 4-5 mm., acute; nerve slender, continuous, or lost in the apex. Seta 1-2 cm.; capsule nearly fusiform, erect, sulcate, 2-3 mm. Exostome teeth slender, erect; endostome processes slender, rather longer.

Doubtfully distinct from *O. australe*

On deadwood slopes of Mt. Wellington.

Orthodontium lineare Schw.

Small, gregarious; stems about 1-2 mm. Leaves linear, 3 mm., acute; nerve narrow, lost below the apex. Seta slender, 1 cm.; capsule narrow-oblong, 1.5 mm.

Beaconsfield, on the ground.

Orthodontium lanceolatum Mitt.

Small, gregarious. Leaves linear-lanceolate, subacute, 3 mm.; nerve lost at a distance from the apex. Seta 5-8 mm.; capsule pyriform, with a rather wide mouth and slender neck, 1 mm.; exostome teeth linear, short, erect; endostome processes much shorter.

On bark of living trees. Gully near Gordon, D'Entrecasteaux Channel.

MNIORBRYUM Schimp.

Slender plants growing in compact tufts. Leaves small, lanceolate; nerve rather bold, not excurrent; cells long, narrow-rhomboid, thin walled. Seta from the apex, slender; capsule inclined short and usually with a broad mouth; lid hemispheric, mamillate; peristome as in *Bryum*, only the cilia very short.

The habit and very lax cells distinguish the genus.

Mniobryum tasmanicum Broth.

Stems 3-5 cm., reddish where mature. Leaves ovate-lanceolate, acute, 1-1.3 mm.; margin distantly serrate; nerve flat, vanishing below the apex. Rest not seen.

New Town Rivulet.

POHLIA Hedw.

Slender mosses with new branches springing from the base and not close under the inflorescence as in *Bryum*.

Leaves lanceolate, elongating round the inflorescence; nerve bold; cells narrow to linear, broader towards the base. Capsule pendulous, clavate-pyriform, with a shortly tapering neck. Peristome as in *Bryum*. Often included in *Bryum*. Differing in shape of cells and not innovating from the top of fertile stems.

Pohlia nutans (Schreb.) Lindb.

Stems short, erect, usually under 1 cm., new branches spring low down the stem, that is, not close below the fertile apex. Leaves broadly to narrowly lanceolate, tapering to an acute apex, erect, mostly 3 mm., margin coarsely or obscurely serrate, not bordered, revolute in the middle, nerve lost in the apex in lower leaves, excurrent in the upper ones, cells long, nearly linear, strongly incrassate. Seta terminating the stem, long, slender, 3-4 cm., capsule pale reddish yellow, cernuous or pendulous, 3-4 mm., narrow pyriform or nearly clavate, narrowed into a slender neck below, constricted below the mouth, broadest below the middle. Lid rather broad hemispheric, apiculate.

Very common.

Pohlia cruda (L.) Lindb.

Rather robust, branches often 3-6 cm., slender. Leaves shining, ovate to ovate-lanceolate, acute, 2.5 mm.; nerve lost at a distance from the apex; margin remotely serrate; cells long, vermiform.

In and about streams on plateau of Mt. Wellington. Barren specimens only.

LEPTOBRYUM Wils.

Small, erect, stems simple or with few branches arising only from the base. Leaves narrow, flexuous-subulate with a broad nerve; cells nearly linear, broad towards the base. Capsule pendulous with a long neck, narrow pyriform; peristome well developed, as in *Bryum*.

Leptobryum pyriforme Br. et Sch.

Pale yellow-green in silky masses, stems usually under 1 cm. Leaves chiefly on the ends of the branches, filiform, flexuose, 5 mm., flat, formed of a broad nerve except at the sheathing base, margin serrate at apex. Seta slender, 2-4 cm.; capsule inclined or pendulous, broadly pyriform, suddenly contracted below into a long slender neck, 2 mm.; lid broadly pyramidal.

Tasman's Peninsula, Back River, Nile.

1913.

BRACHYMENIUM Schw.

Small, erect, innovating from below the fertile apex as in *Bryum*. Leaves ovate; nerve bold; cells rhomboid. Seta long; capsule oblong; lid conic; exostome of 16 closely articulate teeth; endostome reduced to the membranous base, and few irregular processes.

Differing from *Bryum* only in the endostome.

Brachymenium Preissianum (Hpe.)

Small, caespitose, usually 2 mm. high. Leaves ovate-acuminate, 1 mm.; margin plain, closely revolute; nerve bold, shortly excurrent; cells rhomboid, rectangular below. Seta 2 cm., slender; capsule oblong, dark red, 1.5 mm., horizontal, neck short, mouth constricted; lid conic, calyptra very small, cucullate; exostome teeth lanceolate, fairly long; endostome membrane with long slender cilia.

On wall, Hobart.

BRYUM Dill.

Small plants with terminal fruiting, but innovating by two shoots arising close below the fertile apex so as to obscure the true position. Leaves ovate-spathulate to lanceolate; nerve well developed, usually excurrent; cells rather large, thin walled, hexagonal or rhomboid, broader towards the base. Seta long; capsule pyriform to oblong with a solid neck, inclined or pendulous; lid convex, apiculate; peristome double; exostome of 16 lanceolate attenuated teeth; endostome a deep carinated membrane bearing above 16 narrow usually porous processes as long as the teeth, with one to three intervening cilia. The shape of the processes varies a little in different species, also the size and number of the cilia. These latter when well developed bear cross appendages.

A very large genus usually divided into subgenera upon habit and the structure of the endostome. In systematic work the relation of the antheridia is generally made much use of, but not always with advantage.

Group A. Plants rather large for the genus. Leaves mostly clustered at the ends of the shoots, ovate, oblong, or spathulate, apex little acuminate. Capsule with a tapering base.

With a distinct border.

Margin with many serrations.

Nerve excurrent in a short, bold point.

Cells large lax	...	...	...	...	<i>Billardieri</i>
Cells small stiff	...	...	...	...	<i>breviramulosum</i>

- Nerve just excurrent in a slender point.
 Border broad, well-defined... .. *leptothecium*
 Border ill-defined... .. *microrhodon*
- Nerve excurrent in a long point.
 Margin with short serrations *rufescens*
 Margin coarsely serrate *creberrimum*
- Margin with a few serrations at apex,
 or none *bimum*
- Border little or none. Nerve shortly excurrent.
 Margin serrate *campylothecium*
 Margin plain.
 Mouth of capsule constricted *tasmanicum*
 Mouth broad *crassum*

Group B. Leaves ovate, with a tapering acuminate apex, to lanceolate. Nerve excurrent. Plants mostly smaller than in Group A, and the leaves often not clustered at the ends of the shoots.

Leaves ovate, clustered at the tips; border narrow.

- Margin serrate.
 Capsule deep red *pyrothecium*
 Capsule brown *capillare*
- Margin plain.
 Mouth constricted *intermedium*
 Mouth broad *microsporum*
- Leaves ovate, dispersed *torquescens*
- Leaves lanceolate, dispersed, unbordered.
 Margin subserrulate *caespiticioides*
 Margin plain... .. *curvicolium*

Group C. Leaves dispersed along the shoot. Nerve lost in or below the apex, rarely very shortly excurrent. Capsule with a short tapering neck. Plants of various sizes.

Rather robust. Leaves oblong obtuse. Nerve lost in or below the apex.

- Margin unbordered *blandum*
 Border of 1-2 linear cells *laevigatum*
 Border of incrassate cells *rubiginosum*
- Small. Leaves narrow, oblong, rather obtuse, unbordered. Nerve lost below the apex *chrysoneuron*
- Small. Leaves acuminate unbordered... .. *erythrocarpoides*
- Small. Leaves with a broad border, serrulate above *laevigatum*

1913.

Group D. Small plants with dispersed leaves. Capsule small, the base very shortly tapering or obtuse; when fresh the barren base or apophysis usually broader than the spore-case.

Base of capsule not obtuse.

Nerve excurrent *ovicarpum*

Nerve lost in the apex to shortly excurrent.

Margin plain *Sullivanii*

Margin subserrulate *subcupulatum*

Nerve lost in the middle *argenteum*

Base of capsule very obtuse.

Margin not revolute. Nerve shortly excurrent.

Border thickened, serrulate *dichotomum*

Border plain *cupulatum*

Margin revolute. Nerve boldly excurrent.

Leaves broad. Excurrent nerve

shorter than lamina *gambierense*

Leaves narrow. Excurrent nerve

as long as lamina... .. *argillicola*

Bryum Billardieri Schw.

Medium sized, seldom exceeding 1 cm. Leaves clustered at the apex, erect, broadly oblong to obovate-spathulate, 2.4 mm.; margin with a conspicuous border of 3-4 series of linear incrassate cells, revolute below, sharply serrate; nerve shortly excurrent in bold cuspidate point. Cells rather regularly rhomboid, rather thin-walled, averaging $55 \times 20 \mu$. Seta 2 cm. Capsule cylindric, 4 mm., base very tapering, straight or curved, mouth little or not at all constricted; lid broad hemispheric with a central umbo.

Common in grassy places, slopes of Mt. Wellington, Bruny Island, Sheffield, etc.

Bryum breviramulosum Hpe.

Medium with short robust innovations under 1 cm. Leaves rigid, numerous, erecto-patent, densely packed at the ends, obovate-spathulate, 2.4 mm.; margin with a broad thickened border, revolute except towards the apex, where it is sharply serrate; nerve rather strong, red, excurrent in a short cuspidate point; cells rather regularly rhomboid, averaging $25 \times 11 \mu$. Seta 3 cm.; capsule clavate, 4 mm., cernuous or pendulous, mouth not constricted, neck tapering, but not long; lid pyramidal, umbonate.

Very similar to *B. Billardieri*, but more compact, leaves more rigid and cells only half as large. In some specimens

the cells are rather large, excurrent nerve longer, the border less developed, and the serration smaller than in the type.

Very common about Hobart.

Bryum leptothecium Tayl.

Often robust and exceeding 3 cm. Leaves rosulate and spreading at the tips of the innovations, often appearing as whorls along old stems, obovate to broadly spathulate, 3 mm.; margin with a broad border of linear incrassate cells, sharply serrate above, revolute below; nerve only just excurrent from the apex in a minute, cuspidate, recurved point; cells long-rhomboid, unequal, averaging $54 \times 12 \mu$. Seta very long, capsule clavate, usually curved, 3 mm., tapering at the base, mouth little contracted; lid pyramidal, umbonate.

Very common everywhere in woods.

Bryum microrhodon C.M.

Medium size, erect, the innovations about 1 cm. Leaves mostly clustered in globose rosulate tufts at the ends, often in tiers along the branches, erecto-patent, not spreading, broadly ovate, oblong to oblong spathulate, shortly acuminate, 2 mm.; margin revolute below, serrulate above, slightly thickened, but without a well-defined border; nerve red excurrent in a short mucro; cells regularly broadly rhomboid, $35 \times 13 \mu$. Seta 3 cm.; capsule oblong, 3 mm., with a shortly tapering neck; lid hemispheric with a very small umbo. With much the appearance of *B. leptothecium* it is intermediate between that species and *B. campylothecium*.

Slopes of Mt. Wellington, Mt. Field, Bruny Island, Forth River, etc.

Bryum rufescens H.f. et W.

Medium sized, innovations short except in strong shade. Leaves oblong-spathulate, acuminate, erecto-patent, densely clustered at ends of innovations or more dispersed when elongated, 2 mm.; margin with a narrow border of thickened linear cells, revolute below, with short serrations above; nerve excurrent in a long slender cuspidate point; cells irregularly rhomboid, thin walled, averaging $65 \times 20 \mu$. Seta slender, 3 cm.; capsule broadly cylindric, 4 mm., with a tapering base; mouth not constricted; lid broadly hemispheric with a central umbo.

Very close to *B. Billardieri* and apparently connected by intermediate forms. The typical plant has a reddish colour, with a deep red nerve, seta and capsule, but this is inconstant.

In woods, Mt. Wellington, Cradoc, Strahan, etc.

1913.

Bryum creberrimum Tayl.

Short, the innovations seldom reaching 0.5 cm. Leaves crowded at the tips, erecto-patent, oblong-spathulate, 1.5 mm.; margin with a distinct border of 2-3 series of linear indurated cells, coarsely serrate above, slightly revolute below; nerve excurrent in a rather long, slender, cuspidate point; cells irregular, more rectangular than rhomboid, thin walled, $60-80 \times 12-20\mu$. Seta 3 cm.; capsule clavate with a slender tapering neck, mouth not constricted, 3 mm.; lid pyramidal with a sharp umbo.

Near *B. rufescens* but smaller in all parts.

Mt. Wellington, Mt. Nelson, Richmond, Lake Sorell, etc.

Bryum bimum Schreb.

Rather large, the innovations slender, often attaining 3 cm. Leaves dispersed along the shoot but larger towards the apex, ovate-oblong, acuminate, 2-3 mm.; margin with a narrow thickened border of linear cells, revolute below, a few serrulations at the apex, otherwise plain; nerve bold, very shortly excurrent; cells rhomboid, averaging $40 \times 14\mu$. Seta long, capsule clavate-pyriform, 4 mm., neck tapering, mouth little constricted; lid hemispheric, umbonate.

Very common in woods.

Bryum campylotheceum Tayl.

Stem generally about 1 cm. Leaves clustered at the tips, spreading, obovate, 2.5 mm.; margin unbordered, serrulate; nerve bold and shortly excurrent to slender and excurrent in a longer point; cells rather regular, averaging $40 \times 20\mu$. Seta rather strong, 2-3 cm.; capsule clavate-pyriform, neck tapering, 3-4 mm., mouth slightly constricted, lid pyramidal.

Mt. Wellington, Bruni Island, Tunnack, etc.

Bryum tasmanicum Hpe.

Medium to rather robust, stems with the innovations often reaching to 2 cm. Leaves larger upwards but not rosulate, concave, erect, imbricate, ovate, acuminate, 1.7 mm., marginal cells rectangular, but not forming an indurated border; margin plain; nerve bold, shortly excurrent in a slightly recurved tip; cells rhomboid-rectangular, very thin walled $60 \times 17\mu$. Seta long; capsule linear-pyriform with a tapering neck and constricted mouth; lid small, rather flat, umbonate; endostome with a shorter base than in most species, processes short with large pores, cilia not developed.

Very common in woods.

Bryum crassum H.f. et W.

Small, but in damp localities the innovations elongating. Leaves of firm texture, erect, imbricate, 1.5 mm., broadly to narrowly ovate, nearly obtuse; margin quite unbordered, plain or minutely subserrulate; nerve bold, very shortly excurrent; cells oblong-rhomboid, incrassate, averaging $30 \times 10\mu$. Seta 1.5 cm.; capsule pyriform, 2 mm., neck shortly tapering, mouth slightly constricted, lid large hemispheric, umbonate.

Slopes of Mt. Wellington.

Bryum pyrothecium Hpe. et C.M.

Stem short with short innovations. Leaves erect, clustered at the tip, ovate, gradually acuminate above, 1.5 mm.; margin with a very narrow thickened border, revolute below, serrulate above; nerve excurrent in a slender cuspidate point up to $\frac{1}{4}$ length of lamina; cells irregularly rhomboid, thin walled, averaging $60 \times 17\mu$. Seta long, red; capsule clavate-pyriform, deep red, 3 mm., base shortly tapering, mouth little constricted; lid hemispheric, umbonate.

Very close to *B. capillare*.

Mt. Wellington.

Bryum capillare L.

Rather small, densely caespitose, stems usually under 5 mm. Leaves mostly in a terminal cluster, broadly ovate, oblong or subspathulate, acuminate, 1.5 mm.; margin with a narrow yellow border of very long, linear incrassate cells, serrulate above; nerve narrow yellow, merging above into the border and forming a long, slender, cuspidate, hair point; cells rhomboid, thin walled, averaging $60 \times 18\mu$. Seta long, capsule clavate, 3 mm., neck gradually tapering, mouth not constricted, lid broad, pyramidal, acute.

Mt. Nelson.

Bryum intermedium Bridel.

Rather small, closely caespitose, stems seldom exceeding 5 mm., densely radiculose below, the leaves usually in a globose terminal tuft, but more dispersed when growing in moist situations. Leaves from broadly to narrowly ovate, but always gradually tapering above into an acuminate apex, about 2 mm.; margin revolute with a narrow border of incrassate linear cells, otherwise plain; nerve broad, red, rather long excurrent in a slender, cuspidate, point; cells irregularly rhomboid, averaging $60 \times 17\mu$. Seta

1913.

long; capsule clavate-pyriform, 2-3 mm., neck gradually tapering, mouth constricted, lid small, hemispheric, umbonate.

Colebrook, Mount Nelson.

Bryum microsporum Broth.

The shoots including innovations seldom exceeding 0.5 cm. Leaves clustered at the tips, erect, ovate, with a tapering acuminate apex, 1.7 mm.; margin with a narrow border of 2-3 series of incrassate linear cells, plain or with one or two obscure serrations near the apex, generally revolute; nerve in the upper leaves long excurrent; cells irregularly rhomboid, thin walled, averaging $64 \times 20 \mu$. Seta long; capsule clavate-pyriform, base little tapering, mouth not constricted; lid pyramidal, umbonate.

Very close to *B. intermedium*.

Mt. Nelson, Woodbridge.

Bryum torquescens Br. Sch.

Densely caespitose, stems 5-10 mm. Leaves dispersed, twisted when dry, broadly ovate, shortly acuminate, 2mm.; margin revolute with a very narrow border of rectangular cells, serrulate above, sometimes plain; nerve excurrent in a long cuspidate tip; cells irregular, rhomboid, thin walled, $60 \times 18 \mu$. Seta long, capsule clavate, curved, 4 mm.; neck long tapering, mouth not constricted, lid pyramidal, acute.

Specimen in Gunn's collection with no record of locality.

Bryum caespiticioides C.M.

Small, but under favourable conditions the innovations elongating to 2 cm. Leaves dispersed, lanceolate, 1.5-2.5 mm.; margin revolute, serrulate above, marginal cells rectangular, not incrassate; nerve bold, with an excurrent cuspidate tip, varying in length from under $\frac{1}{4}$ to $\frac{3}{4}$ the length of the lamina; cells narrow rhomboid, $50 \times 9 \mu$. Seta 3-4 cm.; capsule linear pyriform with a short to long tapering neck, mouth slightly contracted; lid pyramidal, shining. Variable in breadth of leaf, length of excurrent nerve and base and size of capsule which varies from 1.5 mm., with a bluff base to 3 mm., with a slender neck.

West Coast, slopes of Mt. Wellington, Lake Sorell, etc.

Bryum curvicolium Mitt.

Densely caespitose, usually under 1 cm., but sometimes the innovations elongating. Leaves dispersed, patent, narrow lanceolate to broader, 2-3 mm.; margin plain with

3-4 series of linear cells, but not forming a distinct or thickened border; nerve bold excurrent in a very short bold point; cells long rhomboid, walls thin, averaging $40 \times 10\mu$. Seta long; capsule clavate-pyriform, dark, with slender curved neck, but in drier conditions the capsule pale, and the neck not conspicuously long or bent; mouth slightly constricted, lid pyramidal.

Mt. Nelson, slopes of Mt. Wellington, Colebrook, etc.

Bryum blandum H.f. et W.

Rather robust, in dense mats in running water, dark with livid yellowish-green shining tips, branches 1-2 cm. Leaves erect, imbricate, oblong, obtuse, of thin texture, transparent, 2 mm., margin entire or subserrulate; nerve slender, red, vanishing in the extreme apex; cells linear-rhomboid with an ill-defined border of linear cells on the margin, towards the apex becoming short rhomboid. Rest not seen.

On rocks in running water, slopes of Mt. Wellington, Meander River, Maria Island, etc.

Bryum laevigatum H.f. et W.

Robust, often exceeding 3 cm., black below, yellowish-green at the tips. Leaves erecto-patent, distributed along the shoot, concave, translucent, of rather firm texture, broadly oblong, generally apiculate, 3 mm.; margin with one or two series of linear cells, subserrulate; nerve bold, tapering above and lost in or below the apex; cells shortly rhomboid, strongly incrassate, unequal, averaging $29 \times 16\mu$. Seta slender, 5-6 cm.; capsule pyriform, 2.5 - 4 mm., base tapering, mouth rather constricted; lid hemispheric, umbonate.

Slopes of Mt. Wellington, Alma Tiers.

Bryum rubiginosum H.f. et W.

Erect, densely caespitose, stems simple, often 5 cm., rather robust and red. Leaves delicate, broadly oblong, slightly apiculate, 2.3 mm.; margin with a thickened border of long incrassate cells, broader and revolute below, plain above; nerve red, vanishing at a distance from the apex; cells regularly rhomboid, thin walled, averaging $50 \times 17\mu$. Rest not seen.

St. Patrick's River.

Bryum chrysoneuron C.M.

Rather small, in dense cushions, stems about 5 mm. Leaves dispersed, lanceolate, rather obtuse, 1 mm.; margin

1913.

plain, quite unbordered; nerve very bold, lost below the apex; cells oblong-rhomboid, averaging $50 \times 12\mu$. Seta 1.5 cm.; capsule clavate, 2 mm.; neck slender, tapering; mouth little constricted; lid pyramidal.

Kingston - Longley-road.

Bryum erythrocarpoides Hpe. et C.M.

Small, seldom exceeding 5 mm. Leaves oblong to oblong-lanceolate, acuminate, 1mm.; margin quite unbordered, subserrulate above; nerve vanishing in or below the apex; rarely percurrent, cells rhomboid, $27 \times 8\mu$. Seta 1.5 cm.; capsule oblong, brown, 2 mm., with a short tapering neck and slightly constricted mouth; lid short, broadly pyramidal.

Very common on shaded soil about Hobart.

Bryum laevigatum Broth.

Rather small, the shoots seldom exceeding 5 mm. Leaves dispersed, oblong to oblong-lanceolate, 1.7 mm.; margin with a broad border of elongated cells below, lost above, serrulate; nerve lost in apex to just excurrent; cells irregularly rhomboid, incrassate, averaging $45 \times 12\mu$. Seta 2-3 cm.: capsule dark, broadly pyriform with a tapering neck, 2.5 mm., but the breadth sometimes reduced and the neck less tapering; mouth rather constricted; lid pyramidal.

Slopes of Mt. Wellington, Meander River.

Bryum ovicarpum Broth.

Small, densely caespitose, shoots seldom exceeding 3 mm. Leaves erect, broadly ovate, acuminate, mostly under 1 mm.; margin plain or very slightly subserrulate with one series of rectangular cells on the margin; nerve bold percurrent or shortly excurrent in a cuspidate tip; cells obtusely rhomboid, rather incrassate, $21 \times 8\mu$. Seta 1 cm.; capsule oblong, dark, 1.2 mm.; base swollen, rugose, a little tapering to rather obtuse; lid conic.

Very near *B. Sullivani*.

On wall, Waterworks, Hobart; Huon-road, Barnes Bay, Longley, Colebrook.

Bryum Sullivani C.M.

Stems slender, 1-2 cm., forming a rather dense livid green mat. Leaves dispersed, patent, ovate, concave, subobtusate to shortly acute, 1 mm.; margin plain, unbordered; nerve brown, lost in the apex to shortly excurrent; cells

regularly rhomboid, $36 \times 8\mu$. Seta 1.5 cm.; capsule oblong, dark, 2mm., base swollen rather obtuse; lid convex-conic, acutely umbonate.

Circular Head, Huon-road 9 miles.

Bryum subcupulatum C.M.

Pale yellow green, slender, about 1 cm., densely tufted. Leaves distributed along the stem, ovate, acuminate, subacute, 1 mm.; nerve percurrent to very shortly excurrent; margin subserrulate towards the apex, about two series elongated, otherwise not bordered; cells rhomboid, very irregular. Seta slender, 1 cm.; capsule inclined, oblong, 1-1.5 mm., with a rather swollen apophysis and a very shortly tapering neck.

Zeehan.

Bryum argenteum L.

Small, densely caespitose, silvery white or pale green, innovations usually under 5 mm. Leaves erect, imbricate, shining, broadly oblong, subacute to acute, base green, colourless and transparent above; margin plain; nerve vanishing about the middle, 1.4 mm., cells very large, rhomboid. Seta slender, 1-2 cm. Capsule pendulous or inclined, brown, oblong, 1 mm.; mouth rather broad, base shortly tapering; lid pyramidal.

Common on damp rocks, roadsides, roofs, etc.

Bryum dichotomum Hedw.

Syn.: *B. pachytheca* C.M.

Small, caespitose, the innovations under favourable circumstances occasionally elongating to 1 cm. Leaves dispersed, lanceolate, acute, 1.5 mm., with a border of 2-3 series of linear-rectangular cells, serrulate; nerve bold, shortly excurrent; cells linear-rhomboid, incrassate, unequal, mostly $40-60 \times 12\mu$. Capsule dark red, broadly oblong, 2-3 mm., mouth slightly constricted, the apophysis dark, swollen, rugose with a very obtuse base; lid broad hemispheric, umbonate, shining.

Slopes of Mt. Wellington, Bruni Island, Huon, George Town, etc.

Bryum cupulatum C.M.

Small, caespitose, in dry places stunted, in protected localities the innovations slender, often 1.5 cm. Leaves dispersed, ovate-lanceolate or ovate-acuminate, the base narrowing, 1.3 mm.; margin plain, not revolute, sometimes obscurely subserrulate, not bordered, but 1-2 series of cells

1913.

elongated; nerve shortly excurrent in a white, cuspidate tip or very short; cells narrow rhomboid, thin walled, $40-60 \times 16\mu$. Seta often very long; capsule broadly oblong, in some cases very short, apophysis very swollen, rugose, obtuse, dark; lid broad, pyramidal, shining.

Very close to *B. dichotomum*; differing in the broader leaves with simple nearly entire margin.

Launceston streets, Fitzroy Place (Hobart), Evandale Junction.

Bryum gambierense C.M.

Small, under 5mm., caespitose. Leaves clustered at the ends of the shoots, ovate-lanceolate from a broad base, 1.3 mm.; margin revolute below, serrulate above, bordered by linear cells; nerve strongly excurrent and white at the cuspidate tip; cells very unequal, the lower ones nearly quadrate, the upper ones irregularly rhomboid, rather incrassate, averaging $45 \times 10\mu$. Capsule dark red, oblong, 2 mm., mouth slightly constricted; apophysis dark, swollen, rugose, obtuse; lid broad, shining pyramidal.

Very close to *B. dichotomum*, and many specimens appear intermediate.

Very common in grassy country.

Bryum argillicola Broth.

Very small, yellow green, caespitose, 2-3 mm. Leaves erecto-patent, mostly in a terminal cluster, narrow ovate lanceolate, 1.3 mm., inclusive of the excurrent nerve; margin revolute, obscurely subserrulate above; nerve red with a bold excurrent, cuspidate apex as long as the lamina; cells broadly rhomboid, $20 \times 8\mu$. Seta 1.5 cm.; capsule ovate, 2 mm., mouth slightly constricted, base broader and obtuse but not swollen and rugose.

Port Cygnet, Margate.

Fam. 8—BARTRAMIACEAE.

Habit various; from small erect and densely tufted to creeping and often long and robust; branches few and irregular. Leaves lanceolate with long acute points, seldom shorter; nerve round, excurrent; cells usually oblong to rectangular, each with a prominent papilla, rarely smooth; margin and nerve serrated, rarely almost entire. Seta long; capsule globose or oblong, the sterile base small, inclined or pendulous rarely erect, striate or furrowed rarely smooth; mouth small; lid small convex; calyptra small linear, cucullate; peristome double, single, or none, seldom well developed; peristome teeth 16 simple, of one

series of cells; endostome when present rudimentary. Antheridia, in most genera, numerous in a terminal disk.

A natural group readily known by the leaf structure.

BARTRAMIA. Densely tufted, rarely elongated, antheridia in the terminal axils but not gathered into a conspicuous disk.

BARTRAMIDULA. Decumbent, very small. Leaves small, ovate, imbricate, the nerve vanishing below the apex.

PHILONOTIS. Elongating and vaguely branched. Leaves small, the cells thin walled, rectangular, not much reduced towards the base. Antheridia in a terminal disk.

BREUTELIA. Coarse plants, vaguely branched. Leaves long, tough; basal cells quadrate, which usually extend as a band up the margin. Antheridia in a terminal disk.

CONOSTOMUM. Tufted. Leaves with strongly excurrent nerves. Peristome well developed, the teeth adherent at the apex, forming a cone over the mouth.

BARTRAMIA Hedw.

Erect, dichotomously branched, usually small in dense tufts, cuticle of the shoot of small cells. Leaves opaque lanceolate to narrow-subulate, papillose; cells small, rectangular. Capsule globose, striate; lid shortly conic; calyptra fugacious; exostome of 16 teeth or none; endostome a narrow basal membrane with 16 keeled processes. Antheridia in the terminal axils, not forming an expanded disk.

Stems elongated *Norvegica*

Stems short, tufted.

Leaf-base rectangular.

Leaves spreading *papillata*

Leaves erect *fragilis*

Leaf-base not rectangular *strictifolia*

Bartramia Norvegica Lindb.

Syn.: *B. Halleriana* Hedw.

Stem elongated and pendulous, often 12 cm., with few irregular branches, at a high altitude reduced to 3 cm. and erect. Leaves squarrose, long and slender, from a sheathing base, 10 mm.; margin spinulose, recurved; nerve continuous; cells rotundo-quadrate, small, incrassate, elongated in the sheathing base. Seta on a short lateral branch, 5 mm.; capsule inclined, oblique, sulcate, globose; exostome teeth short, lanceolate, dark brown.

Very common on the slopes of mountains.

1913.

Bartramia papillata H.f. et W.

Stems short, closely tufted, seldom exceeding 1 cm. Leaves spreading, narrow-linear, suddenly contracted from a rectangular, expanded, hyaline, sheathing base, 4 mm.; serrate on the margin and nerve, margin incurved; nerve continuous; cells rectangular with small obtuse papillae, basals larger, pellucid. Seta 2 cm.; capsule slightly inclined, globose-pyriform, sulcate; exostome teeth short, lanceolate.

Kingston, Maria Island, Western Tiers, etc.

Bartramia fragilis Mitt.

Stems short, erect, in dense tufts. Leaves erect, imbricate, stiff, linear suddenly contracted from a rectangular pellucid base, 4 mm.; margin spinulose; surface shortly papillose; nerve broad, continuous. Seta 1 cm.; capsule erect, oblong, 1.5 mm. Doubtfully distinct from *B. papillata*.

Western Tiers.

Bartramia strictifolia Tayl.

Small, erect in dense tufts, dark below, the tips pale green, seldom exceeding 1 cm. Leaves erect, closely imbricate when dry, narrow linear-lanceolate from a broad but not defined base, tapering to an acute point, 2.5 mm.; margin spinulose-serrate, nerve continuous; cells regular rectangular. Seta 1 cm.; capsule globose, erect, 1.5 mm.; mouth small; lid short and small. Peristome teeth small, slender, incurved, inserted on a short colourless membrane.

Maria Island, Bruni Island.

BARTRAMIDULA Schimp.

Stems small, erect from a creeping stolon. Leaves ovate, imbricate, the nerve vanishing below the apex. Capsule globose, pendulous or erect; peristome none; lid rather flat with a short obtuse umbo; calyptra small, broadly cucullate.

Distinguished by the small size, creeping habit and gymnostomous capsule.

Bartramidula pusilla (H.f. et W.) Sch.

Small, caespitose, creeping, the branches erect under 1 cm. Leaves small, 0.6 mm., imbricate, narrow ovate, acute, obscurely dentate; cells rectangular, averaging $38 \times 14\mu$. Fruiting branch short at the base of innovations. Seta slender, bent or straight at the apex, 1 cm. Capsule

globose, pendulous, smooth, 1.5 mm., mouth small, lid minute.

Common in wet open situations.

Var.: *Weymouthii*. Capsule erect, nodulose; mouth broader. Port Cygnet, Gordon, Margate.

PHILONOTIS Bridel.

Suberect or decumbent, vaguely branched, spreading, branching often dichotomous. Leaves squarrose lanceolate, acute; nerve bold continuous to shortly excurrent; cells rectangular, rarely quadrate, those of the base not conspicuously shorter. Capsule globose or oblong, inclined or pendulous, striate; peristome as in *Bartramia*. Antheridia numerous, forming a relatively broad disk surrounded by an involucre of large leaves.

Distinguished from *Breutelia* by less robust habit and the different leaf structure.

Stems slender; leaves remote.

Leaves prominently papillose	...	...	<i>scabrifolia</i>
Leaves serrate	..	...	<i>tenuis</i>
Stems long, simple and slender...	...	...	<i>fertilis</i>
Stems robust, leaves imbricate	...	...	<i>rigens</i>

Philonotis scabrifolia H.f. et W.

Syn.: *Ph. remotifolia* H.f. et W.

Slender, pale sage-green, the branches usually fascicled at the ends of the stems. Leaves patent, not crowded, ovate-lanceolate, tapering to an acute point, 0.8 mm.; margin, nerve, and surface strongly scabrid; nerve shortly excurrent; cells quadrate-rotund. Seta 2-3 cm.; capsule inclined ovate-globose, sulcate, 2-2.5 mm., mouth broad; exostome teeth lanceolate; endostome processes slender from a basal membrane.

Colebrook, Mt. Nelson, near Launceston, Western Tiers, etc.

Philonotis tenuis Tayl.

Stems slender, simple or with fascicled branches, usually 2-3 cm. Leaves erecto-patent, not crowded, lanceolate, tapering to a very slender point, 3 mm., margin and nerve serrate; nerve rotund, excurrent in a long point; cells linear-rectangular, transparent. Seta 3-4 cm.; capsule globose, inclined 2.5 mm., striate. Exostome teeth lanceolate, rather short; endostome with a membranous base and short irregular processes.

Slopes of Mt. Wellington, Mt. Nelson, Mt. Roland, etc.

1913.

Philonotis fertilis Mitt.

Stems very slender, suberect, numerous in dense masses, 4-8 cm., usually with a fascicle of branches at the apex. Leaves patent, ovate-lanceolate, tapering to a slender apex, 3 mm.; nerve bold, continuous; margin slightly thickened, boldly serrate, surface obscurely papillate; cells broadly linear. Rest not seen. Growing in very damp places and probably only a form of *Ph. tenuis* Tayl.

Ben Lomond, Recherche.

Philonotis rigens Broth.

Stems numerous, erect, simple or with terminal fascicles of branches, covered below with dark brown radicles. Leaves erecto-patent, closely overlapping, of rather firm texture, ovate-lanceolate, tapering to a rather slender apex, 2 mm.; nerve bold, continuous, margin and nerve sharply serrate, surface papillate, cells rectangular, shorter towards the base.

In appearance resembling *Breutelia affinis*, but the cell structure quite distinct from that of a *Breutelia*.

Near Sorell.

BREUTELIA Schimp.

Robust and coarse, branches long, spreading, copiously covered with purple or brown radicles. Leaves squarrose, lanceolate from a broad base, tapering to an acute apex, usually with three or four deep plaits on each side; nerve excurrent; cells narrow oblong to linear above, long linear below, with a band of quadrate cells at the basal margin sometimes not well developed. Capsule pendulous, ovate or oblong, sulcate when dry; mouth constricted; peristome as in *Bartramia*. Antheridia numerous in a broad terminal disk surrounded by an involucre of larger leaves.

Medium sized. Leaves with obscure or no plaits.

Band of marginal quadrate cells distinct.

Leaves imbricate when dry ... *affinis*

Leaves not imbricate ... *commutata*

Band of few broader cells or none.

Upper cells short ... *pendula*

Upper cells linear ... *Siberi*

Robust. Leaves with deep longitudinal plaits.

Base of leaf contracted ... *divaricata*

Base of leaf geniculate sheathing.

Border of oblong colourless cells ... *comosa*

Border of quadrate brown cells ... *crassa*

Breutelia affinis H.f. et W.

Medium sized, procumbent in rather dense mats, the stems covered with brown radicles except at the tips, fasciculately branched above, usually 3-5 cm. Leaves squarrose, ovate-lanceolate, tapering to a slender apex, imbricate when dry, plaits shallow, only towards the base, 3-5 mm., surface rather roughly papillate; margin revolute, serrulate to serrate above, rough from the papillae below; nerve slender excurrent; cells shortly linear above, longer towards the base, with a broad band of quadrates on the lower margin. Seta 2-3 cm.; capsule broadly oblong, pendulous, 2 mm.

Very common on ground.

Breutelia commutata Hpe.

Habit of *B. affinis*, but usually smaller, seldom exceeding 2.5 cm. Leaves patent, only slightly imbricate when dry, ovate-lanceolate, with a slender apex, 2 mm., roughly papillate, margin recurved, serrate above; nerve long excurrent; cells oblong above, linear below, a well marked band of broad quadrate cells on the lower margin. Seta pale 2 cm.; capsule oblong, pendulous.

Very close to *B. affinis* and not differing materially in any detail. Doubtful species.

Very common on ground.

Breutelia pendula Hook.

Decumbent, vaguely branched, mostly 3-5 cm., clothed with brown radicles. Leaves patent, ovate-lanceolate, tapering to a very slender apex, 3-4 mm.; margin recurved, serrate, surface rather roughly papillate; nerve slender, excurrent in a rather long point; cells linear to oblong above, longer below, those of the lower margin rectangular to quadrate, but these characters vary much in degree in different specimens. Seta slender, capsule narrow-oblong, pendulous.

The spreading leaves, less pronounced border of quadrate cells and longer upper cells depart from the structure of *B. commutata*, and approach in some specimens very close to *B. Sieberi*.

Kingston, Knocklofty, slopes of Mt. Wellington.

Breutelia Sieberi Hornsch.

Decumbent, about 3 cm., with few dichotomous branches, covered, except the apex, with black radicles. Leaves squarrose, yellow, glossy, usually secund, not imbricating when dry, ovate-lanceolate, with a slender acute apex,

1913.

2.5 mm., not plicate, papillae few and small; nerve serrate, excurrent; margin acutely serrate above; cells linear, only a few broad ones at the angles. Seta 1-2 cm.; capsule rather small inclined, broadly oblong furrowed.

On wet ground, Longley.

Breutelia divaricata Mitt.

Robust, 5-8 cm., with few irregular branches, not densely clothed with radicles, pale olive green. Leaves ovate-lanceolate, narrowing at the base, tapering to a slender apex 2.5 mm., strongly plicate; nerve slender, excurrent to lost in the apex; margin serrate, external surface minutely papillose; cells irregular from oblong-quadrate to rectangular above, linear below, with an ill-defined band of broader cells on the lower margin. When growing in water the stems are slender, very long, the leaves divaricate, dark green, with a broad base and a very excurrent nerve. Rest not seen.

Cheshunt, Maria Island, Mt. Wellington.

Breutelia comosa Mitt.

Robust, with suberect dichotomous or fasciculate branches, 6-12 cm., usually covered for the greater portion with brown radicles. Leaves squarrose, yellowish, glossy, 4-5 mm. plicate, lanceolate from a broad geniculate, sheathing base, tapering to a slender apex, surface minutely papillose; margin serrate; nerve slender, continuous; cells rectangular above, linear below, the sheath bordered by 4-6 series of large delicate, colourless cells. Seta 3 cm.; capsule pendulous, oblong, furrowed.

Common Mt. Wellington, Western Tiers, etc.

Breutelia crassa H.f. et W.

Robust, elongating to 15 cm., suberect with few branches. Leaves squarrose, yellowish, glossy, lanceolate from a broadly sheathing geniculate base, plicate, tapering to a slender apex, 5 mm., papillate; margin serrate; nerve slender, shortly excurrent; cells narrow rectangular to linear above, long linear below, the border of the sheath of 4-6 series of enlarged, quadrate, brown rather incrassate cells. Seta 5 cm.; capsule inclined, narrow-oblong, furrowed.

Probably only a robust condition of *B. comosa* with more rigid leaves, papillae larger, border cells brown, and more incrassate.

Mt. Wellington.

CONOSTOMUM Swartz.

Small, erect in dense tufts. Leaves lanceolate, keeled, imbricate; nerve excurrent; margin serrate; cells rectangular. Capsule broadly obovate, striate, inclined, on a long seta; lid small with an oblique rostrum, calyptra large for the family, cucullate; peristome teeth linear-lanceolate, connivent in a cone and adhering together at the apex.

Conostomum pusillum H.f et W.

Small, tufted, erect, yellowish-green with erect innovations from below the fertile apex. Leaves erect, imbricate, lanceolate, very acute, 1-2 mm.; nerve bold slightly to much excurrent. Seta yellow, slender, 2-3 cm.; capsule broadly ovate or nearly globose, inclined striate when dry, 2 mm.

Common on mountain plateaux and occasionally at a low elevation.

Conostomum australe Swartz.

In dense bright green tufts of similar habit to the last but larger. Leaves narrow lanceolate, erect, imbricate with a long hair point, 2-3 mm. inclusive, external surface, except at the base coarsely papillose; nerve bold, long, excurrent. Seta 3-4 cm.; capsule erect or nearly so, globose, shining, striate when dry, 3 mm.

Mt. Wellington, Mt. Field, Western Tiers.

Fam. 9—SPLACHNACEAE.

Erect, clustered, with few short dichotomous branches. Leaves broad, membranous and flaccid, nerve slender, smooth; cells large, thin walled, rhombic or pentagonal. Capsule erect on a long seta, small and cylindric upon an apophysis often large or exceeding the capsule; lid very small, convex or conic; calyptra small conic or cleft on one side; peristome of 16 geminate or 8 bigeminate narrow-lanceolate teeth, sharply reflexed when dry.

A well defined family readily distinguished by the peculiar capsule.

TAYLORIA. Apophysis long, cylindric, but little broader than the spore-case.

TETRAPLODON. Apophysis spherical, much broader than the spore-case.

TAYLORIA Hook.

Medium sized, sometimes elongating. Leaves large celled, of delicate texture, spatulate. Seta bold, capsule erect, spore case short narrow cylindric with a longer cylindric

1913.

apophysis at the base little or not at all broader than the spore-case; peristome teeth short, sharply recurved. Leaf acute, nerve excurrent.

Margin plain	...	...	...	...	...	<i>octoblephara</i>
Margin dentate	...	...	...	...	...	<i>callophylla</i>
Leaf obtuse, nerve vanishing	...	...	...	...	...	<i>obtusissima</i>

Tayloria octoblephara (Hook.) Mitt.

Syn.: *Splachnum octoblephorum* Hook.

Stems numerous, erect, forming dense cushions. Leaves pale green or tinged with red, ovate-spathulate with a filiform apex, 2-4 mm., but variable, sometimes oblong, at others the apex reduced. Margin plain to obscurely serrate; nerve slender excurrent in perfect leaves, but on rapidly growing shoots often vanishing even below the middle. Seta erect, usually about 1 cm.; capsule broadly cylindric, dark, about 1 mm., at its base a cylindric apophysis longer and generally narrower; lid nearly flat, obtusely mamillate; calyptra small cucullate; teeth of peristome short, lanceolate, geminate, sharply recurved when dry.

Very common at all altitudes and correspondingly variable. Some specimens with leaves more serrate than usual approach *T. callophylla*.

Tayloria callophylla (C.M.) Mitt.

Stems elongated, 5-10 cm., simple or with few branches, clothed nearly to the apex with purple radicles. Leaves delicate yellow-green, squarrose, narrow spathulate with a slender apex, 3 mm.; margin prominently dentate; nerve slender excurrent in a cuspidate piliferous tip. Seta bold, 1-1.5 cm.; capsule cylindric, 2 mm., with a tapering apophysis of same length.

Said to have been gathered on slopes of Mt. Wellington, but the only specimen in the collections is from New Zealand.

Very near forms of *T. octoblephara*.

Tayloria obtusissima Broth.

Stems long, decumbent, 5-7 cm. Leaves yellow-green, squarrose, obovate-spathulate, obtuse, 3 mm.; margin plain or irregular from the turgid cells; nerve very slender, vanishing some distance below the apex; cells quadrate or hexagonal above, long-rectangular towards the base. Rest not seen.

Southern side of Mt. Wellington.

TETRAPLODON Br. Schim.

Rather small, densely caespitose, capsule broadly oblong with a narrow mouth and an inflated apophysis; peristome teeth bigeminate.

Nerve excurrent *tasmanicum*

Nerve lost above *Gunnianum*

Tetraplodon tasmanicum Hpe.

Erect in dense tufts, simple, 1 cm. Leaves yellow-green, patent, 2 mm., obovate-lanceolate; margin entire, undulate above; nerve fairly broad, yellow, excurrent. Seta stout, brown, 5 mm.; capsule inclusive of apophysis about 1 mm.; apophysis globose with a white zone round the upper half; peristome teeth recurved when dry, bigeminate.

Mt. Zeehan, Adamson Peak, La Percuse.

Tetraplodon Gunnianum (Hk.)

Syn.: *Splachnum Gunnii* Hk.

Habit of *T. tasmanicum*, only rather larger. Leaves obovate, squarrose, 2 mm.; margin sub-dentate, nerve slender, vanishing above the middle. Seta short, stout, 2-3 mm.; capsule as in the last species, but the apophysis larger, more discoid; peristome erect when dry.

West Coast. On Tree ferns.

Fam. 10—FUNARIACEAE.

Small or medium size, soft, in tufts, or dispersed, erect, simple or with few branches. Leaves few, ovate-lanceolate, with a thin nerve, smooth; cells large, hexagonal to rhomboid. Capsule spherical, oval or pyriform, erect or cernuous on a long seta; lid short, convex; calyptra with a long beak and inflated base, cleft on one side or many lobed; peristome of 16 lanceolate teeth usually twisted or sometimes short and straight or absent; endostome when present of 16 short lanceolate teeth.

A well-defined group with laxly-constructed leaves. The capsule larger than the barren base. The peristome when perfect is double, but the endostome is never well developed; the exostome in the most advanced forms has incurving teeth which are attached to a cribiform disk.

GIGASPERMUM. Creeping, with sessile capsules.

PHYSCOMITRIUM. Capsule obconic, with a broad mouth; calyptra small mitriform.

FUNARIA. Capsule pyriform; calyptra oblique with an inflated cucullate base.

1913.

GIGASPERMUM Lindb.

Small, creeping, with short erect branches. Leaves broad, imbricate, nerveless, of delicate texture, the cells large rhomboid and thin walled. Capsule hemispheric on a very short seta immersed in the terminal leaves; mouth very broad, lid flat, calyptra broad and short, peristome none.

Gigaspermum repens (Hook) Lindb.

Syn: *Leptangium repens* Mitt.

Erect, leafy branches budlike, 2 mm. Leaves pale imbricate, the upper ones broadly ovate, with a long slender apex, 1-1.5 mm.; margin subserrulate.

On the ground, Bellerive; Cataract Hill, Launceston.

PHYSCOMITRIUM Brid.

Small, erect. Leaves oblong, nerve slender, lost below the apex. Capsule obconic; lid shortly convex, abruptly rostrate or apiculate; calyptra with a short inflated cleft base; peristome, none.

The genus is close to *Funaria*, but has a different modification of the base of the calyptra.

Physcomitrium conicum Mitt.

Small, erect, simple, mostly about 5 mm. Leaves oblong, acuminate, 2 mm.; margin of one series of longer cells, serrate above; nerve slender, lost in or below the apex. Seta 5 mm.; capsule obconic, with a broad mouth, 1.5 mm.

Leith's Creek.

Physcomitrium laxum H.f. et W.

In loose tufts, 1 cm. Leaves dispersed along the stems, narrow to broadly oblong, acuminate, 2.5 mm.; margin plain; nerve vanishing below the apex to rather low down on the leaf. Capsule as in *Ph. conicum*.

Probably a shade form of the last.

Upper Meander River.

FUNARIA Schreb.

Small, simple, erect. Leaves ovate to lanceolate; cells large, lax, rhomboid. Capsule on a rather or very long seta, pyriform, oblique, and inclined, sometimes nearly erect; lid short and convex; calyptra with a large inflated base split on one side; exostome when well developed of 16 slender lanceolate teeth, twisted and attached at the apex to a cribiform disk, from this a series of reductions till

the cycle may be quite absent; endostome a short basal membrane and 16 slender processes.

The genus may be readily divided into two sub-genera.

Entosthodon. Capsule erect, with a fairly distinct neck; peristome none, or of short incurved teeth.

Peristome none.

Leaves broadly ovate *apophysata*

Leaves lanceolate... .. *producta*

Peristome present.

Nerve lost below the apiculus . . . *gracile*

Nerve excurrent *cuspidata*

Eufunaria. Capsule inclined; peristome double.

Capsule smooth.

Mouth broad.

Leaves not crisping when dry ... *glabra*

Leaves crisping when dry ... *crispula*

Mouth rather narrow *tasmanica*

Capsule furrowed; seta curved *hygrometrica*

Funaria apophysata (Tayl.)

Very small, simple, 1-2 mm. Leaves in a terminal tuft, patent, imbricate, broadly ovate, acuminate, 0.5 mm.; margin plain; nerve slender excurrent in a fine point. Seta seldom much longer than the capsule; capsule linear-pyriform, 2 mm., half of which is barren neck, slightly constricted below the mouth; annulus thin dark red; peristome none.

Macquarie Plains, Kingston.

Funaria producta (Mitt.)

Very small, 1 mm. Leaves erect in a cluster, lanceolate, base broad but much attenuated above, very acute, 1 mm.; margin plain; nerve excurrent. Seta 5 mm.; capsule from nearly globose with a short neck to more slender with a long tapering neck, 1 mm.; mouth slightly constricted; peristome none.

Blackman's Bay, East Coast, Western Tiers, Mt. Nelson, etc.

Funaria gracile H.f. et W.

Stems very short. Leaves ovate-acuminate, sometimes with a strong apiculus, 1 mm.; nerve red usually lost in or below the apex, but in lower leaves often continuous, or again in some specimens dissolves just below the apex, the apiculus again indurated. Seta slender, 1-2 cm.; cap-

1913.

sule pyriform, neck short, 1 mm., dark red; peristome of short dark teeth.

Blackman's Bay, Kingston, etc.

Funaria cuspidata H.f. et W.

Stem very short. Leaves broadly ovate, acuminate, 1 mm.: nerve red, bold, excurrent in an acute point; capsule clavate-pyriform, tapering into a short neck, 1 mm.; peristome teeth short, incurved, with a broad base and slender point.

Continuous with *F. gracile*.

Carlton.

Funaria glabra Tayl.

Small, about 3 mm., simple. Leaves clustered, imbricate when dry, readily restoring, broadly ovate-spathulate, apiculate, 1.5 mm.; margin subserrulate, the marginal cells rectangular, incrassate; nerve slender, vanishing below the apex. Seta 1 cm.; capsule broadly pyriform, inclined, bent, unequal, 2 mm.; neck short, mouth broad; exostome teeth lanceolate with slender tips twisted when young, erect when old, only slightly barred; endostome processes similar and nearly as long, adhering to the exostome below.

Very common.

Funaria crispula H.f. et W.

Small, erect, 2.3 mm. Leaves in a terminal cluster of rather more delicate texture than in *F. glabra*, crisping when dry and not readily restoring, obovate-spathulate, apiculate, 2 mm., margin serrulate with one row of rectangular incrassate cells; nerve slender, red, vanishing in the upper portion. Seta slender, 1 cm.; capsule pyriform, inclined, bent, pale, 1 mm., mouth rather broad; peristome as in *F. glabra*, from which it differs only in texture of leaves, and that is due probably to growing in intense shade. The recorded difference in capsule and peristome not consistent.

Huon, Meander River, etc.

Funaria tasmanica Hpe.

Short and simple, seldom exceeding 5 mm. Leaves in a terminal tuft, broadly ovate-spathulate, apiculate, 2-3 mm., margin regularly serrulate, the marginal cells not elongated nor incrassate; nerve slender, vanishing in the upper third. Seta slender, 2 cm., straight or nearly so, capsule inclined, linear-pyriform, slightly oblique, smooth, 3 mm.; mouth rather constricted, ring not developed, neck

very tapering; exostome twisted, the teeth long slender with filiform colourless points, bars distant and not bold; endostome processes similar and half as long, pruinose, adhering at the base to the peristome.

Rhyndaston.

Funaria hygrometrica (L.) Sibth.

Erect, simple or with few branches, usually under 1 cm., but much elongating in moist shaded places. Leaves elliptic, apiculate, usually 2-3 mm.; margin plain with one line of linear slightly thickened cells; nerve slender continuous. Seta very long curved towards the apex; capsule pyriform, oblique, bent furrowed, 2-2.5 mm., tapering into a short neck; mouth slightly constricted, very oblique, ring strongly developed, red; exostome teeth twisted, their points attached to a cribiform disk, teeth bold, barred, lanceolate; endostome of 16 pale processes of same length as exostome.

Very common, especially on burnt ground.

Fam. 11—HYPNACEAE.

Habit various, from simple creeping to dendroid, seldom pulvinate. Leaves lanceolate to orbicular, usually smooth; cells usually long, but in one subfamily rotundo-quadrate, small and papillate. Seta arising from a very short branch low down on the stem, never terminal, long and slender; capsule oblong to cylindric, usually curved; lid conic to rostrate; calyptra narrow cucullate; peristome always double and well developed; the exostome of 16 lanceolate teeth with a zig-zag commissural line in the centre externally, and coarsely lamellate on the inner surface; endostome with a deep membranous base and 16 slender perforate or gaping processes; cilia long or short, slender, 3-2-1 or none.

A very large family clearly distinct from the terminal fruiting forms, but passing into *Neckeraceae* insensibly. The seta is always long, the peristome perfect, and, except in the *Leskeas*, the cells are elongated. Many bryologists now split this large family into numerous smaller ones, but this would not carry any advantage in a local flora, though it can with advantage be divided into three sub-families.

Sub-family.—**Hypneae.** Habit various. Leaves mostly ovate-lanceolate, smooth, nerve well developed, single, rarely reduced or absent.

1913.

HYPNUM. Medium sized, decumbent, vaguely branched
Leaves patent; nerve lost above the middle.

DREPANOCLADUS. Elongated water moss. Leaves very
acute, the terminal ones secund, forming a sickle-like
end to the shoot; nerve lost above the middle.

CAMPYLIUM. Slender water moss. Leaves small, strongly
divaricate; nerve lost in the apex.

PTYCHOMNION. Robust ground moss. Leaves strongly
divaricate, nerveless.

HYPNODENDRON. Dendroid. Leaves ovate, distichous;
nerve lost in the apex.

MNIODENDRON. Dendroid. Leaves not distichous; nerve
excurrent.

Sub-family.—**Stereodontaeae.** Decumbent, vaguely or pin-
nately branched. Leaves smooth, shining, with a strong
tendency to become distichous or secund; nerves 2, very
short, obsolete or none.

RHAPHIDOSTEGIUM. Leaves narrow, acute, nerveless, at
the basal angles three or four oblong inflated cells.
Lid with a long beak.

STEREODON. Leaves generally secund, narrow acute, nerve-
less or very faint, an irregular patch of quadrate cells
at the angles. Lid conic.

ISOPTERYGIUM. Leaves narrow, acute, sub-distichous, no
quadrate cells at the angles; no nerve.

PLAGIOTHECIUM. Leaves broad, distichous, obliquely in-
serted, nerve double or forked.

CATAGONIUM. Leaves distichous, laterals conduplicate,
nerveless, apiculus short, recurved.

ACANTHOCLADIUM. Leaves with a distichous tendency,
nerveless, oblong concave with a long slender api-
culus.

ACROCLADIUM. Leaves nearly orbicular, obtuse with one
or two short faint nerves.

Sub-family.—**Leskeae.** Decumbent. Leaves small, cells
rotundo-quadrate, papillose.

THUIDIUM. Branching pinnate; stems with paraphyllia.

PSEUDOLESKEA. Branches few irregular, stems without
paraphyllia.

HYPNUM Dill.

Plants prostrate, creeping, seldom large or very small,
pinnately or vaguely branched. Leaves ovate to lanceo-
late; nerve single, lost above the middle; cells narrow,

linear or vermiform, thin walled, smooth, those towards the base quadrate and larger. Seta long rough with minute tubercles or smooth; capsule narrow to broadly oblong with a bluff base, inclined, curved; lid conic, often with a long beak; peristome double, the exostome teeth narrow lanceolate with an irregular hyaline border; endostome a deep membrane and 16 processes as long or longer than the exostome, cilia 1-3, slender.

The genus is large and the species closely related. In order to reduce the group to more convenient dimensions it is often the custom to divide it into genera founded on unimportant details.

BRACHYTHECIUM. Generally robust. Capsule broadly oblong with a bluff base; lid conic, the rostrum short. Leaves plicate.

Robust. Leaves not secund.

Seta rough throughout *rutabulum*

Seta rough above, smooth below *campestre*

Seta smooth *salebrosium*

Small. Leaves secund *paradoxum*

RHYNCHOSTEGIUM. Leaves spreading on all sides from a narrow slightly decurrent base, not plicate, with a strong nerve. Seta smooth; lid with a long slender beak.

Leaves strongly serrate *aristatum*

Leaves slightly serrulate *tenuifolium*

RHYNCHOSTEGIELLA. Small mosses. Leaves divergent, lanceolate, acuminate, remotely serrulate. Seta rough; capsule tapering at the base; lid with a long nearly straight rostrum.

Leaves obtuse *convolutifolium*

Leaves very acute *muriculatum*

OXYRRHYNCHIUM. Medium sized. Leaves broadly oblong acuminate, finely or remotely serrulate. Seta rough; capsule with a long curved beak.

Leaves large, patent *austrium*

Leaves small, divaricate, broad *remotifolium*

Hypnum rutabulum L.

Decumbent, spreading in loose yellowish green mats, irregularly pinnate. Leaves patent, glossy, ovate, with a slender apex to but shortly pointed, apex remotely to closely serrulate; nerve faint, lost in or above the middle, 2.3 mm.; cells narrow-linear, those at the base and angles broader. Seta dark red rough throughout, capsule cylin-

1913.

dric, curved, inclined, reddish brown, contracted below the mouth and bluff at the base, lid conic; peristome dark.

Variable in length of leaf point, closeness of serrations and length of nerve.

Very common in damp situations.

Hypnum campestre Bruch.

Decumbent, livid yellow, with irregular branches, 6-10 cm. Leaves erecto-patent, shining, plicate, lanceolate, very acute, 3 mm.; margin shortly revolute, near the apex rather thickened and remotely serrate; nerve very slender vanishing above the middle; cells long linear, those at the base and angles broader and shorter. Seta rough in the upper part, smooth below, capsule cylindric, curved; lid conic; teeth yellow.

Distinguished from *H. rutabulum* by the narrower, more plicate leaves as well as the smooth lower half of the seta.

Deloraine, Longford, slopes of Mt. Wellington.

Hypnum salubrosum Br. Sch.

Habit of *H. rutabulum*. Leaves usually narrower and more erect, with a long slender apex, serrulate in the upper portion; nerve more distinct, lost in or above the middle. Seta smooth; lid conic.

Recorded as Tasmania, but not present in any of the available collections.

Hypnum paradoxum H.f. et W.

Decumbent, irregularly branched, matted, 3 cm. Leaves yellow, falcate, secund, lanceolate, acute from a broad base, nerved beyond the middle, 1.5 mm.; margin serrulate; cells long linear, shorter and broader at the base, a triangle of many quadrates at the angles. Seta slender, minutely rough, brownish red; capsule short, 1.5 mm., oblong with a very bluff base; lid shortly conic; peristome pale brown.

Resembling a *Stereodon*.

On the ground, Old Beach; Cheshunt.

Hypnum aristatum H.f. et W.

Decumbent, forming pale green mats, pinnately branched, 1-2 cm., much elongating amongst grass. Leaves patent, concave, ovate, acuminate, strongly serrate, 1 mm.; nerve obscure, vanishing about the middle; cells broadly linear. Seta red, smooth; capsule short, oblong; curved; lid with a long, acute rostrum.

Slopes of Mt. Wellington, Cheshunt.

Hypnum tenuifolium Hedw.Syn.: *H. collatum* H.f. et W.

Decumbent, irregularly branched, 3-6 cm. Leaves patent, concave, shining, ovate, shortly acuminate, 2.2 mm.; margin obscurely serrulate; nerve slender, ill-defined, vanishing above the middle; cells narrow, slightly broader at the base. Seta long, red, smooth; capsule broadly oblong, inclined, curved; lid with a long acute beak.

Slopes of Mt. Wellington, Mt. Nelson, Coal River Tier, etc.

Hypnum convolutifolium Hpe.

Small, decumbent, 3-5 cm., with many irregular, erect branches. Leaves patent oblong, convolute when dry, base narrow, apex rather obtuse, 1 mm.; margin obscurely serrulate; nerve slender, vanishing above the middle; cells narrow oblong, shorter near the apex, becoming quadrate towards the base. Seta 1 cm., slender, dark, rough; capsule inclined, oblong, dark, constricted below the mouth, neck swollen, 1.3 mm.

Latrobe.

Hypnum muriculatum H.f. et W.

Rather small, decumbent, branches ascending, 1 cm. Leaves divaricate, narrow ovate with a rather long attenuated apex, 1 mm.; margin serrate, but not closely so; nerve slender, lost above the middle. Seta 1 cm., red, rough; capsule inclined, oblong, tapering at the base, 1 mm., lid rostrate of the same length.

Slopes of Mt. Wellington, Circular Head.

Hypnum austrinum H.f. et W.

Decumbent, widely spreading, with few branches, dull olive green, young shoots pale yellow green, shining, 5-10 cm. Leaves patent, oblong, acute, concave, 2 mm.; margin finely serrate; nerve broad at the base, rapidly narrowing and lost in the middle, cells narrow linear, rather broader towards the base. Seta rough, 2 cm., capsule broadly oblong, inclined, 2 mm., gibbous; lid rostrate, nearly as long.

Guy Fawkes Rivulet, Mt. Wellington; near Frenchman's Cap.

Hypnum remotifolium Mitt.Syn.: *H. asperipes* Mitt.

Small, decumbent, with few branches, 2-3 cm., bright yellow-green. Leaves divaricate, rather crisped, broadly ovate, nearly orbicular, with a slender apex, 1 mm.; margin

1913.

closely, acutely serrate; nerve slender. Seta red, 1.5 cm., rough; capsule inclined, arcuate, oblong-cylindric, 1.7 mm., dark, base attenuated, mouth very wide.

St. Crispin's Well, Mt. Wellington; Cheshunt.

DREPANOCLADUS Warnst.

Robust elongating mosses growing in water, branches few and irregular, the leaves secund and curved in a sickle form at the ends of the shoots. Leaves lanceolate with a slender apex, imbricate; nerve vanishing above the middle; cells narrow vermiform, only those at the base rather broader. Seta long; capsule oblong with a tapering neck inclined or rarely erect; lid conic, rather short; peristome as in *Hypnum*.

A small group of water mosses distinguished by their habit and sickle-shaped leaves.

Drepanocladus fluitans (L.) Warnst.

Stems procumbent, often 12 cm. Leaves narrow lanceolate, tapering to a long slender apex, more or less falcate, 2.5 mm.; margin entire.

Common in the bed of creeks.

Drepanocladus brachiatus Mitt.

Very close to *D. fluitans*, but more robust. Leaves falcate, more spreading, lanceolate, acute, up to 5 mm.

In the bed of creeks, often growing with *D. fluitans*.

CAMPYLIUM Sull.

Slender, prostrate, elongating, branches few and irregular. Leaves close set, broad below with a sharply divaricate acute point; nerve single, bold, lost in the apex; cells oblong, longer towards the base. Seta slender; capsule inclined cylindric; lid short, conic; peristome as in *Hypnum*. Living in water or very wet places. Very seldom fruiting.

Branches few *relaxum*

Branches many.

Nerve defined *decussatum*

Nerve faint *molle*

Campylium relaxum (H.f. et W.)

Stems simple, often 5-7 cm., dark green. Leaves broadly ovate with an acute acuminate point, 1.3 mm.; margin obscurely subserrulate; nerve bold, lost in the apex; cells irregularly linear-oblong.

Forth River Falls.

Campylium decussatum (H.f. et W.)

Habit of the last, only more branched and with smaller light green leaves. Leaves broadly ovate with an acuminate apex, 1 mm., margin subserrulate, nerve not strong, lost in apex; cells nearly rhomboid, thin-walled.

Recorded from Tasmania, but no specimen in the collections, and possibly an erroneous identification.

Campylium molle Broth.

Slender, decumbent, with numerous, short, lateral branches forming close mats on stones in running water, 3-6 cm. Leaves broadly ovate with a short, sharp, acuminate apex, 1.2 mm.; margin subserrulate; nerve broad but faint, lost in the apex; cells thin walled rectangular to rhomboid. Differing from *C. decussatum* slightly in habit and in the nerve being fainter.

Coal River Tier.

PTYCHOMNION H.f. et W.

Robust, decumbent, with few irregular branches. Leaves in many rows, divaricate, broadly elliptic or ovate from a narrow base apex suddenly narrow, flat and rather long; nerve none; margin subserrate below, spinulose above; cells linear, strongly incrassate, the ends bluff with lateral connections. Seta tall, slender, dark, smooth; capsule broadly cylindric, arcuate, strongly ribbed, with a shortly attenuated neck; lid hemispheric with a subulate rostrum as long as the capsule; calyptra long, cucullate, smooth; exostome teeth cartilaginous, lanceolate, slender, with a very attenuated closely trabeculate apex; endostome membrane deep, the processes perforated, lanceolate from a broad base, usually with two or three short cilia between them.

Ptychomnion aciculare (Brid.) Mitt.

Forming extensive yellow or greenish mats, stem rather slender, red, tough. Leaves 3-4 mm. Seta straight, 2.5-3 cm.; capsule 3 mm.

Very common on the ground and on deadwood.

HYPNODENDRON Mitt.

Stem erect with a fascicle of branches at the top. Leaves of rather soft texture, distichous, thin; margin and nerve armed with single or double spinulose teeth; nerve strong, lost in the apex; cells linear. Seta arising from the base of the branches, slender, long; capsule cylindric, ribbed;

1913.

lid with a rostrum less than half length of capsule; calyptra very narrow; peristome pale yellow, teeth lanceolate, gradually tapering to a very slender apex; endostome membrane deep, processes lanceolate, perforate, cilia 2-3, very long.

Leaves distichous, pale *spininervum*

Leaves dispersed, dark *Archeri*

Hypnodendron spininervum Hook.

Syn.: *Isothecium spininervum* Hook. *Trachyloma arcuata* Mitt.

Stems about 5 cm. Branch leaves distichous, light green, shining, broadly ovate, acute, 2 mm., equal or slightly oblique, surface minutely papillose, cells narrow linear. Seta 4 cm.; capsule inclined, slightly to much curved, 3.5 mm.; lid conic, rostrate, not half as long.

Slopes of Mt. Wellington, Gordon, Tasman's Peninsula.

Hypnodendron Archeri Mitt

Syn.: *Isothecium Archeri* Mitt.

Habit of the last, but the leaves less distichous and dull dark green. Leaves oblong-lanceolate, acute, oblique, 1.5 mm., surface smooth; nerve lost in the apex; cells rather broader and thinner walled. Seta 3 cm.; capsule narrow-cylindric, 4 mm.; lid conic.

Not a well-defined species.

Port Arthur, West Coast.

MNIODENDRON Lindb.

Robust, erect, dendroid; stem covered with matted rhizoids, branches fascicled at the apex. Leaves lanceolate from a broad base, very acute, margin slightly thickened; nerve bold, excurrent; cells long, narrow linear. Capsule cylindric furrowed, pendulous on a long seta arising from the base of the branches; lid acutely rostrate; calyptra long, cylindric, cucullate; exostome teeth lanceolate, smooth, closely articulated, commisural line very faint; endostome a deep membrane, the processes same length gaping or perforate, cilia three, slender, also same length.

The following forms are very closely related, and it is doubtful to what extent they should be considered specifically distinct.

Branches in a regular fascicle.

Base of leaf broad *comosum*

Base of leaf narrow *comatum*

Branches in a dispersed fascicle *Sieberi*

Mniodendron comosum (Lab.)

Stem erect, about 5 cm., bold, closely covered with brown fibrils and divaricate leaves. Branches 1.5-2 cm. in a defined fasciculus at the top of the stem. Leaves lanceolate from a rather broad base, 4 mm.; margin irregularly serrate above; nerve thick, excurrent in a rather long point; cells very narrow linear, slightly broader at the basal angles, not strongly incrassate. Seta 3 cm., red; capsule cernuous or pendulous, with eight grooves, deep red, neck tapering, black, 3 mm.; lid acutely rostrate, shining, 3 mm.; calyptra short, smooth.

Common in damp forests.

Mniodendron comatum (C.M.)

Syn.: *Isothecium Colensoi* H.f. et W.

Habit of *M. comosum*, only the branches usually longer and dark green, the stem with but little clothing of rhizoids. Leaves lanceolate from a relatively narrow base, 5.5 mm.; margin thickened, rather coarsely spinulose, exserted nerve very long; cells cylindric, not long, more incrassate and regular than in the other species, in the upper part and near the margin short oblong-rhomboid, those of the basal angles quadrate enlarged. Other details as in *M. comosum*.

Slopes of Mt. Wellington.

Mniodendron Sieberi C.M.

Syn.: *Isothecium Sieberi* C.M.

Habit and appearance of *M. comosum* only the branches more dispersed. Leaves divaricate, lanceolate from a broad cordate, sub-auricled base, very acute, margin slightly thickened with few spinulose teeth above, 4 mm.; nerve exserted in a long filiform point; cells very long linear. Other features as in *M. comosum*.

Damp gullies, Mt. Wellington; Ida Bay.

RHAPHIDOSTEGIUM Schimp.

Medium to small mosses with, in most instances, a near resemblance to *Stereodon*, decumbent, elongated, rarely short, pinnate. Leaves small glossy, generally falcate and secund, lanceolate, acute; nerves if present 2, short and faint; cells vermiform with an alar patch of 3-4 large oblong cells. Seta slender; capsule small, oblong, straight, erect or inclined; lid conic with a long slender beak; peristome pale yellow, the exostome teeth broad below with a slender bordered apex; endostome membrane deep, pro-

1913.

cesses very slender and longer than the exostome; cilia none (?).

A natural group, distinguished from *Stereodon* by the long beak to the lid and the peculiar alar patch of inflated cells. Of the following species the first four are very close, and might well be treated as unstable forms of one.

Leaves small, falcate, strongly secund.

Margin plain or with few serrulations.

Stems short, vaguely branched ... *calliferum*

Stems elongated, closely pinnate ... *callidioides*

Margin distantly serrulate.

Stems irregularly branched *tenuirostre*

Stems long, closely pinnate *cerviculatum*

Margin regularly serrulate *cyparioides*

Leaves larger, slightly secund.

Margin serrulate, livid or green ... *Joliffii*

Margin plain, golden brown *homomallum*

Leaves not secund *crassiusculum*

Rhaphidostegium calliferum Hpe. et Geh.

Yellow, decumbent, with numerous pinnate short branches, forming close mats. Leaves erecto-patent, secund, base broad, attenuated upwards to a slender recurved apex, 1.7 mm.; margin plain; nerve none; cells long vermiform, two or three at the angles quadrate and inflated. Seta smooth, 1.3 cm.; capsule inclined or pendulous, oblong, pale brown, 1.2 mm.; peristome pale yellow.

Common on deadwood.

Rhaphidostegium callidioides Hpe. et C.M.

Habit and structure almost of *R. cerviculatum*, only less robust. Leaves shining, secund, lanceolate with an attenuated usually serrated apex, 1-2 mm., nerve none; cells long vermiform, three or four at the basal angles large inflated oblong. Seta slender, 1 cm.; capsule cernuous or pendulous, not exceeding 1 mm.; peristome pale yellow.

Near Port Cygnet.

Rhaphidostegium tenuirostre (H.f. et W.)

Syn.: *Hypnum tenuirostre* H.f. et W.

Pale greenish yellow, decumbent, with numerous, irregularly pinnate branches. Leaves shining, patent, secund, falcate, base ovate-oblong, tapering above into an attenuated apex, 1.2 mm.; margin distantly serrulate, nerve none; cells long vermiform with 3 large oblong inflated cells at the angles. Seta red, slender, 2 cm.

Common on deadwood.

Rhaphidostegium cerviculatum (H.f. et W.)Syn.: *Hypnum cerviculatum* H.f. et W.

Decumbent, livid green, main shoots elongating, closely set with short lateral branches, forming a broad dense mat. Leaves shining, strongly secund, narrow oblong-ovate or lanceolate, gradually narrowing into long attenuated serrated apex, 1.7 mm.; margin subserrulate, nerve none; cells long vermiform, three or four at the angles oblong, very large. Seta slender, red, 1.5 cm.; capsule oblong, cernuous, straight, 1.4 mm.

Common on deadwood and stone.

Rhaphidostegium cyparioides (Brid.)Syn.: *Hypnum leptorrhynchum* Brid.

Decumbent, stems elongated, bearing few leaves but many small lateral branches, pale greenish yellow. Leaves shining, secund, lanceolate, more gradually tapering into an attenuated point than in adjoining species, 1.5, upper portion acutely serrate; nerve none; cells vermiform, three or four at the angles oblong, inflated, large. Seta very slender, 1.5-2 cm.; capsule pendulous or cernuous, narrow oblong, 1 mm.; peristome pale.

On deadwood, common.

Rhaphidostegium Joliffii (Mitt.)Syn.: *Hypnum Joliffii* Mitt.

Procumbent, with few long irregular branches, livid yellow. Leaves loosely secund, shining, oblong-ovate with an attenuated apex, 2 mm.; margin usually serrulate towards the apex; nerve none; cells long vermiform, with 4 at the angles large inflated, linear-oblong. Seta 1.5 cm., red, bent at the apex; capsule cernuous, oblong, straight, 1.4 mm.

When growing in water often dark brown, leaves less secund and less attenuated.

Very common on margins of woodland streams.

Rhaphidostegium homomallum (Hpe.)

Coarser than the other members of the genus, chestnut brown or golden, in dense mats, branches many, suberect, short. Leaves slightly secund, ovate-lanceolate with a short, straight, acute point, 1.6 mm.; margin plain; nerve none; cells vermiform, shorter and more incrassate than in other species, about four at the basal angles very large. Seta 1 cm.; capsule erect, slightly curved, narrow oblong, 2 mm.

Pirate's Bay, East Coast; Eaglehawk Neck.

1913.

Rhaphidostegium crassiusculum Brid.Syn.: *Hypnum contiguum* H.f. et W.

Pale greenish yellow, in small mats, branches short, erect. Leaves patent, slightly or not at all secund, lanceolate, acute, 1.6 mm.; margin plain; nerve none; cells vermiform, four at the basal angles very large inflated. Seta 1 cm.; capsule oblong, cernuous or pendulous, 1.2 mm.

Slopes of Mt. Wellington, Bellerive.

STEREODON Mitt.

Stems decumbent, spreading, vaguely or pinnately branched. Leaves ovate, acute, to lanceolate with a tapering apex, usually secund and falcate appearing distichous, base narrow; nerves two, obsolete or none; margin serrate to plain; cells narrow, vermiform, smooth with a more or less defined patch of numerous quadrate cells at the angles. Seta long, smooth; capsule cylindric with a tapering neck, curved; lid conic, acute; exostome teeth narrow lanceolate, bordered; endostome 1-3rd membranous, processes slender usually with pores; cilia usually one.

Distinguished from *Rhaphidostegium* by the short conic lid and the alar patch of quadrates, numerous, but without the few inflated cells.

Without flagellate branches.

Regularly pinnate.

Leaves recurved in the middle ... *cupressiformis*

Leaves not recurved ... *Mossmanianus*

Irregularly branched.

Leaves secund ... *chrysogaster*

Leaves imbricate ... *cupressiformis*

Leaves spreading ... *Nelsoni*

With flagellate branches.

Leaves of flagellum acute ... *Walterianus*

Leaves of flagellum obtuse ... *flagelliramus*

Stereodon cupressiformis (L.) Brid.

Shoots long, usually with very numerous, regular, short branches forming dense mats, yellowish or pale green. Leaves usually sharply secund, shining, ovate lanceolate with an attenuated much curved upper portion, recurved in the middle, 1.5 mm.; margin plain below, minutely serrate towards the apex, nerves usually none, in some cases two faint basal nerves may be seen, cells fusiform or short vermiform, at the basal angles a well-defined triangular

patch of about twenty enlarged quadrate cells; perichæ-tials oblong, erect, sometimes serrate, with a filiform re-curved point. Seta 1.5 cm.; capsule oblong, slightly in-clined, slightly bent, pale brown, 1.8 mm.; lid convex with a short acute rostrum, smooth.

Very common on deadwood.

f. robusta. Branches few, robust; leaves oblong with a short acuminate point not secund, nerve more apparent. Other details as above. All intermediate stages fairly common.

On the ground amongst grass.

Stereodon Mossmanianus C.M.

Decumbent, elongated, with numerous pinnate lateral branches, pale yellow green. Leaves closely secund, shining, lanceolate not recurved, base not broad, but from there tapering upwards into an attenuated curved point, 1 mm.; margin plain, nerve none; cells vermiform, nine to twelve at the angles irregularly quadrate; perichætials erect sheathing with slender terminations. Seta 2 cm.; capsule nearly erect, slightly bent, oblong, 2.7 mm.; lid with an acute point.

Very close to *S. cupressiformis*. Differing in the non-recurved leaves, smaller alar patch and entire upper margin.

Hobart Rivulet on stones.

Stereodon chrysogaster (C.M.) Mitt.

Syn.: *Hypnum patule* H.f. et W.

Shoots long, irregularly pinnate, branches mostly long forming a loose mat, pale greenish. Leaves rather closely secund, shining, broadly ovate-lanceolate, the attenuated upper portion not long, curved, 1.8 mm.; margin plain or subserrulate; nerve none; cells long fusiform, a small patch of six or eight enlarged cells at the angles, three of which are larger and oblong as in *Rhaphidostegium*; perichætials lanceolate, with erect slender points usually serrulate. Seta 2 cm.; capsule inclined, narrow oblong, slightly bent, 2.2 mm.; lid with a short, acute point.

Habit much less regularly pinnate than in *S. Mossmanianus*; leaves broader and the alars differently constructed.

Common on deadwood.

Stereodon Nelsoni Broth.

Shoots long, slender, with pinnate, not very numerous nor short, lateral branches, pale yellow-green. Leaves equally dispersed, not crowded, nearly squarrose, concave,

1913.

incurved, ovate, obtuse to slightly acute, 1 mm.; margin serrulate; with two very faint short nerves sometimes obsolete; cells broadly vermiform, the basal series quadrate, but those at the angles not in a defined patch. Rest not seen.

The absence of fruit and the habit make its position in this genus provisional.

Mt. Nelson.

Stereodon Walterianus (Hpe.)

Decumbent, branches pinnate, elongated to slender filiform, flagellate, pale yellow. Leaves of the main branches secund, falcate, broadly ovate, with a short tapering apex, those of the flagellate branches erecto-patent, straight or slightly recurved, narrow ovate-lanceolate tapering to a slender point, 1 mm.; margin entire or obscurely subserulate; nerve none or in some leaves a faint sign of a single nerve; cells vermiform, in the angles a well defined patch of about ten quadrate cells; perichætials erect, lanceolate with a slender point. Seta 1 cm.; capsule slightly curved, narrow oblong, 1.6 mm.; lid conic, acute.

On branch of tree, Hobart Rivulet.

Stereodon flagelliramus (C.M.) Broth.

Decumbent, elongated with numerous short erect branches; the ends of many of these become flagellate with small closely appressed leaves. Leaves of the normal branches equally dispersed, erecto-patent, broadly oblong from a rather broad base, above rather suddenly contracted to a short narrow apex, 1.8 mm.; margin obtusely serrate; nerve none; cells short vermiform, about twelve enlarged quadrate in a well defined small patch at the angles. Leaves of the flagella narrow oblong, closely appressed, obtuse, serrate, .4 mm.; cells nearly rhomboid.

On deadwood. Hobart Rivulet.

ISOPTERYGIUM Mitt.

Suberect, small, slender, irregularly branching. Leaves in five irregular rows in typical species, sometimes more numerous, lanceolate from a broad base, thin, smooth, shining: margin plain; nerve none or two very obscure; cells narrow fusiform with very acute ends, thin walled, one row of basal cells shorter and broader. Seta slender. capsule erect or nearly so, oblong, curved; lid conic, short, obtuse; exostome teeth slender, strongly barred: endostome membrane half length, processes as long, slender, cilia usually absent.

Differing from *Stereodon* in the broader base of the leaves, absence of quadrate alars, besides habit.

Leaves secund *limitum*
 Leaves straight *acuminatum*

Isopterygium limitum (H.f. et W.) Broth.

Syn.: *Stereodon limatus* (H.f. et W.)

Decumbent or suberect, the stem not widely spreading, branches many, vague, erect, equal, incurved at the apex, often decumbent when dry. dull greenish yellow. Leaves secund, shining, lanceolate, from a very broad base tapering nearly equally to the acute apex, concave, incurved, 1.2 mm.; margin plain; nerve none; cells long fusiform, those at the basal angles not distinct; perichæetials lanceolate, erect, points slender but not elongated. Seta 2 cm.; capsule erect or slightly inclined, slightly bent, oblong, up to 2.7 mm.; lid conic, obtuse or nearly so. Peristome teeth slender, rather strongly barred; lower half of endostome a membrane, upper half of linear processes sometimes perforated, no cilia.

Very common on deadwood.

Isopterygium acuminatum Bosw.

Small, decumbent. Leaves lanceolate from a broad base tapering into a piliferous apex, inserted irregularly in five series, patent, about 1 mm., margin plain; nerve none; cells very long, delicate, one line of quadrate cells at the base. Rest not seen.

West Coast, Meander at Western Tiers.

PLAGIOTHECIUM Schimp.

Stems decumbent with few irregular branches, flat. Leaves ovate to lanceolate, oblique, obliquely inserted, upper and lower series erect and appressed, laterals patent, shining, smooth; nerve double, often united below, obsolete or none; cells long, fusiform, thin walled. Seta slender; capsule cylindric with a tapering base, inclined, curved; peristome pale yellow; exostome teeth slender lanceolate, densely articulated; endostome membrane deep, processes long, slender; cilia usually one, sometimes none.

Distinguished by the complanate habit and oblique leaves.

Plagiothecium lamprostachys Hpe.

Pale green, delicate, 2-5 cm. Dorsal and ventral leaves erect, appressed; lateral leaves patent, broadly ovate,

1913.

acuminate, oblique, 2 mm.; margin plain, entire, sometimes a few serrations close to the apex; nerves two, united at the base, obscure; cells long fusiform. Seta slender, 2 cm.; capsule cylindric, inclined, slightly curved, yellow-brown, neck slender, 1.7 mm.; peristome yellow.

On tree ferns, deadwood and ground Plateau of Mt. Wellington, Western Tiers, Gordon, etc.

CATAGONIUM C.M.

Decumbent, vaguely branched, shoot flattened, the leaves assuming a distichous arrangement. Leaves oblong, apiculate, very concave, nerves 2 faint; cells very long vermiform, with acute ends, but little shorter at the base. Seta slender; capsule slightly inclined cylindric with a tapering base; lid shortly conic; endostome membrane $\frac{1}{3}$, processes slender; cilia 2-3, unequal.

Catagonium politum (H.f. et W.) Mitt.

Decumbent, flat, shining, usually 4 cm. Leaves concave to conduplicate with a very short recurved apiculus, 2 mm. Capsule about 2 mm.

Common in damp forests.

ACANTHOCLADIUM Mitt.

Procumbent, usually much elongating and regularly pinnate, the tips of the branches slender and acute. Leaves thin, smooth, shining, with a long filiform apiculus: nerve none; cells long vermiform, a defined patch of quadrate and a few inflated oblong cells at the angles. Seta long smooth, flexuose; capsule cernuous, short, broadly oblong, curved, neck tapering; lid broadly conic, umbonate; peristome pale, teeth with a broad base and a rather suddenly attenuate, slender, colourless apex, closely articulate, and very rough on the margin; endostome membrane deep, processes very slender gaping; cilia none.

Acanthocladium extenuatum (Brid.) Mitt.

Syn.: *Hypnum extenuatum* Brid. *H. crinitum* H.f. et W.

Pale yellowish green, 3-12 cm. or more, subcomplanate. Leaves oblong, from a narrow base, concave, surface minutely papillose. Upper margin and apiculus serrate, suddenly contracted above into a long, slender apiculus, 1.75 mm. Capsule red, 2 mm.

Very common on deadwood.

ACROCLADIUM Mitt.

Stems decumbent, simple or with few irregular branches, the ends bluffly acute. Leaves concave, imbricate, short and very broad, orbicular or with an obtuse apex, with a small auricle at the angle, glossy; nerves two or one, short, faint or obsolete; cells vermiform, usually with forked ends, a well defined patch of numerous thin walled quadrates in or near the auricle. Seta slender, very long, smooth; capsule oblong or cylindric, slightly bent; lid shortly conic; peristome pale, teeth lanceolate; endostome membrane $\frac{1}{3}$ length, cilia unequal.

Acrocladium auriculatum (Mont.) Mitt.

Procumbent, elongating to 10 cm., vaguely branched. Leaves shining, suborbicular, concave, erecto-patent, imbricate, 2 mm.; margin entire; nerve usually single, rarely double or none; cells long and narrow, the patch of lax quadrates placed between the insertion and the auricle. Capsule short, broadly oblong, with a short tapering neck.

Slopes of Mt. Wellington.

Acrocladium chlamydophyllum H.f. et W.

Very similar in habit to *A. auriculatum*. Nerves consistently two; cells shorter and broader, the quadrates very numerous, placed in and occupying the auricle. Capsule cylindric with a tapering base.

Very common on ground.

THUIDIUM Br. Sch.

Decumbent, the main axis elongating and bearing pinnate, bi-, or tri-pinnate branches usually rather regularly arranged, at least the main axis more or less clothed with paraphyllia. Leaves minute, ovate, acuminate; nerve well developed, lost above to excurrent; cells very small, round or quadrate, papillate. Seta long, smooth, arising from the main axis; capsule oblong, curved, inclined; lid rostrate; peristome teeth long, lanceolate; endostome membrane deep, processes slender, cilia 3-4.

Ultimate branches with paraphyllia.

Branches regularly pectinate *laeviusculum*

Ultimate branches without paraphyllia.

Branches rather regular, with flagel-

late tips *sparsum*

Branches irregular.

Nerve in leaves of ultimate bran-

ches lost below apex *unguiculatum*

1913.

Nerve dissolved in apex.

Branching bipinnate *furfurosum*Branching pinnate *Stuartii**Thuidium laeviusculum* (Mitt.) Jaeg.

Primary shoot long, procumbent, with annual elongations, each section with numerous, erect, short, closely pinnate secondary branches; paraphyllia very numerous; leaves broadly cordate with long flagellate, serrate tips. Ultimate branchlets also with paraphyllia; leaves ovate; 0.4 mm.; nerve vanishing below the apex; cells each with a prominent forked papilla; the nerve armed externally with prominent serrations. Seta 3-4 cm.; capsule inclined, larger and more curved than in the other species, 3-4 mm. Rest not seen.

Common in shady woods.

Thuidium sparsum (H.f. et W.) Jaeg.

Habit of *T. furfurosum*, but the secondary branches more numerous and close set with flagellate tips. Leaves of primaries as in *T. furfurosum*; those of secondaries ovate-cordate, margin serrulate, nerve vanishing in or below the apex; cells rotundo-quadrate, with short obtuse papillae. Fruit not present in Tasmanian specimens.

West Coast.

Thuidium unguiculatum (H.f. et W.) Jaeg.

Very similar to *T. furfurosum*, only less robust. Leaves of primaries cordate with an attenuate apex, nerve continuous, under 1 mm. Leaves of secondaries smaller, ovate from a broad base, nerve lost below the apex; cells coarsely nodulose, papillate. Perichætials as in *T. furfurosum*, the vaginule bearing numerous slender paraphysis. Seta slender, 3 cm.; capsule inclined, cylindric, curved, 2 mm.; lid with a slender rostrum as long as the capsule; calyptra clothed with a few long erect hairs at the base.

Very common in damp places.

Very close to *T. furfurosum* and often considered only as a variety. Though the typical plant is distinct there appear to be numerous intervening forms, also with *T. Stuartii*.

Thuidium furfurosum (H.f. et W.) Jaeg.

Procumbent, branches pinnate or irregularly bipinnate. Primaries relatively robust, densely covered with paraphyllia; leaves cordate with a rather long acuminate apex, 1.5 mm.; nerve strong, continuous, but partially dissolved

in the upper part; cells irregularly rotundo-quadrate, incrassate, with short simple oblique conical papillae. Leaves of secondaries similar but smaller, attenuate apex shorter, nerve lost in the apex. Perichætials erect, rather long, with attenuate points, nerve continuous, cells elongated, nearly vermiform. Seta slender, 3 cm., capsule inclined, curved, constricted below the mouth, 2.5 mm.; lid rostrate, nearly as long as the capsule.

Very common in shady places.

The plant varies greatly according to conditions under which it is living.

Thuidium Stuartii C.M.

Slender, much spreading, usually with simple, short, or long branches. Leaves of primaries as in *T. furfursum*. Leaves of secondaries cordate with a rather long tapering point; margin serrulate, nerve dissolving in the apex, cells with a coarse, simple, acute, conic, oblique papilla. Seta 3 cm.; capsule inclined, curved, 2 mm.; lid with an acute rostrum nearly as long; calyptra often with a few long hairs.

Common in woods. Mostly in dry situations.

Often included with *T. furfursum*.

Pseudoleskea Schimp.

Small, decumbent, with few vague decumbent branches, with clusters of radicles at intervals, without paraphyllia. Leaves opaque, small, lanceolate from a broad base; nerve well developed; cells rotund, nodulose-papillate. Seta rather long, capsule cylindric, erect, slightly oblique; lid shortly conic; exostome teeth lanceolate, endostome with a deep membrane and lanceolate processes, usually with one short cilium.

Differs from *Thuidium* in the absence of copious regular branching as well as absence of paraphyllia.

Pseudoleskea imbricata (H.f. et W.) Broth.

Decumbent, with few vague branches, often rooting from the lower surface, 2-4 cm., yellow. Leaves ovate lanceolate, acute, patent, 1.5 mm.; margin revolute except towards the apex; nerve lost below the apex; cells rotundo-quadrate, papillae prominent, nodulose. Rest not seen.

Knocklofty, Hobart; Mt. Nelson, Colebrook.

1913.

FAM. 12.—NECKERACEAE.

Habit very varied, generally robust, seldom in dense cushions. Leaves plurifarious but often complanate, usually thin and smooth; nerve sometimes well developed, often obsolete, and then sometimes double. Cells in most cases short, small and incrassate; in other species much elongated. Fruit lateral except in *Hedwigia* and *Hedwigidium* where it is terminal or apparently so; seta usually short, sometimes nearly absent, rarely long; capsule small, oblong and operculate except in *Pleurophascum* where it is large, globose and astomous; lid conic or shortly rostrate; calyptra cucullate or mitriform; peristome double the exostome of 16 lanceolate teeth; endostome with a basal membrane and 16 slender processes, cilia usually absent; from this condition the development is reduced in genera till the peristome is quite absent.

The family is not a natural one. It is made up of divers forms that do not fit in well with the other Pleuracarpi. They may be conveniently grouped in five sub-families.

Sub-family. **Spiridentaceae.** Leaves very narrow, the upper portion consisting of the excurrent nerve; cells rotundo-quadrated.

ECHINODIUM. Branches few, long; seta long.

CYRTOPUS. Branches few, short; seta short.

Sub-family. **Lembophyllaceae.** Dendroid to long and pendulous sometimes with equal branches, rarely pinnate. Leaves concave, broad, of thin texture, nerve generally obsolete or double and obscure, when more developed vanishing above the middle; cells from oblong to vermiform. Seta short, sigmoid.

THAMNIUM. Small, vaguely branched, cells ovate, nerve lost above the middle.

LEMBOPHYLLUM. Medium size; branching pinnate or vague; nerve obsolete or broad and dissolving, cells oblong or fusiform, rarely linear.

WEYMOUTHIA. Elongated with long branches; nerves two, short and very faint; cells vermiform or linear, often oblong at apex.

CAMPTOCHAETE. Dendroid. Leaves rather complanate; nerves 2, obsolete; cells vermiform.

PAPILLARIA. Elongated, pendulous; nerve single vanishing above the middle, surface more or less papillose; cells oblong to fusiform.

Sub-family. **Cryphaeaceae.** Habit more or less dendroid;

in most genera the leaves and branches are strongly complanate; nerve may be well developed to obsolete; the cells short oblong to vermiform. In most genera the capsule is nearly sessile; endostome with filiform processes.

Capsule sessile.

DENDROCRYPHAEA. Nerve lost below apex; cells small rhomboid; branches very short.

CRYPHAEA. Nerve lost below apex; cells small, rhomboid; branches elongating.

RHABDODONTIUM. Nerveless; cells broadly linear; branches very short.

NECKERA. Nerves faint or none; cells oval to rhomboid; leaves with undulating surface.

Seta long.

HOMALIA. Leaves unsymmetric; nerves obsolete; cells rhomboid.

TRACHYLOMA. Leaves symmetric; nerve obsolete; cells vermiform.

Sub family. **Leucodontaceae.** Medium sized mosses of rather soft texture, pale; leaves imbricate, not complanate, nerveless or nerve obsolete; cells rhomboid to vermiform, seta never very short; peristome imperfect, in one species astomous.

LEPYRODON. Leaves obtuse with a hair-like apiculus, cells vermiform.

GLYPTOTHECIUM. Leaves ovate-lanceolate acute; cells fusiform with a broad band of oblong cells on the margin.

PLEUROPHASCUM. Leaves obovate with a flagellate apiculus; cells large, rhomboid. Capsule large, globose, astomous.

Sub-family. **Hedwigiaceae.** Medium sized mosses of dark colour or dingy green. Leaves plurifarious, tough, imbricate, nerveless; cells quadrate to linear. Capsule on a seta terminating a short lateral branch or sessile and terminal; peristome none.

RHACOCARPUS. Seta not very long placed below the branches. Leaves with long apiculus; cells linear.

HEDWIGIDIUM. Capsule sessile. Leaves dingy green; cells quadrate.

HEDWIGIA. Capsule sessile. Leaves with white tips; cells quadrate.

1913.

ECHINODIUM Jur

Habit elongated, simple, or with few branches, flaccid. Leaves plurifarious, linear-lanceolate or filiform, rather long, the greater length made up of the broad excurrent nerve; cells small, irregularly rotundo-quadrate, smooth, rather incrassate. Seta medium length, smooth, curved above; capsule short; broadly oblong, inclined, equal; lid rostrate; exostome teeth lanceolate, slender, bordered by a thin membrane; endostome membrane half as deep as the exostome, processes lanceolate, perforated, two or three irregular cilia between each pair.

The genus may be quite as well referred to *Hypnaceae*, but its affinity to *Cyrtopus* justifies its position in this family.

Echinodium hispidum (H.f. et W.) Jur.

Syn: *Hypnum hispidum*, H.f. et W.

Branches long, often 15 cm., sometimes with slender flagellate tips, dark green, flaccid, simple or nearly so. Leaves patent, filiform from a broader base, 4.5 mm., margin plain, nerve flat, broad, forming the upper two-thirds of the leaf. Seta 1.5 cm.; capsule very broad, 1.8 mm.

Very common on banks of streams in shady mountain slopes.

CYRTOPIUS Hook.

Rather robust, erect from a creeping rhizome usually with a few irregular branches above. Leaves close set, the base short, oblong, erect, then very slender recurved to a filiform apex; margin plain below, spinulose above; nerve slender, excurrent; cells oblong to fusiform, strongly incrassate. Fertile branches very short, lateral. Seta slender short; capsule erect, oblong; calyptra short cucullate; lid obliquely conic-rostrate; peristome double, erect; exostome teeth narrow lanceolate; endostome membrane short, processes subulate rather shorter than the exostome.

Cyrtopus setosus (Hedw.) Hook.

Often 5-8 cm. Leaves 5 mm.; perichaetia not differing. Seta 4 mm.; capsule narrow oblong 2 mm.

Reported from Tasmania but no Tasmanian specimen in the collections. Very possibly an error.

THAMNIUM Schimp.

Erect or suberect, dendroid from a creeping rhizome, irregularly branched from the base. Leaves complanate, ovate; nerve single, flat, lost above the middle; cells ovate-

hexagonal. Seta short or long arising from the main stem; capsule inclined, equal, oblong; lid rostrate; exostome teeth long, slender, endostome membrane rather deep, processes long slender, gaping below; cilia usually 2 slender.

Thamnum pumilum (H.f. et W.).

Syn: *Isothecium pumilum* H.f. et W., *Neckera rivalis* Mitt.

Stems numerous erect dendroid, branches few, irregular, equal or nearly so, about 1.5-2 cm. Leaves of branches in three rows, complanate, elliptic, acute 0.7 mm.; margin irregularly serrate; nerve single vanishing about or above the middle.

On stones in streams. Slopes of Mt. Wellington. North West Coast, etc.

LEMBOPHYLLUM Lindb.

Rather robust, pinnately branched, but the branches in some species long, irregular, vague. Leaves orbicular concave, nerve indistinct or absent, cells usually oblong or fusiform, rarely linear. Seta rather long smooth; capsule oblong; lid conic. Exostome teeth lanceolate acute but without filiform tips, bordered by a thin delicate membrane; endostome a short membranous base, processes perforate not exceeding the exostome, cilia usually two.

Nerve none or very obscure.

Cells linear *cochlearifolium*.

Cells fusiform *clandestinum*.

Nerve broad, cells oblong *divulsum*.

Lembophyllum cochlearifolium Schw.

Stems suberect from a creeping rhizome, sub-dendroid or vague, branches elongating 6-10 cm. complanate. Leaves patent, not strongly imbricate, concave, very broadly ovate with a very short, subacute, acuminate apex, 2 mm.; margin subserrate; nerves 2, obsolete; cells all shortly linear with obtuse ends, a small patch of brown cells at the angles.

The specimen in Gunn's collection, identified by Mitten, has no locality attached. It appears to be not at all common, but confusion has arisen through other mosses being identified as this. *Acrocladium chlamydophyllum*, *Weymouthia molle* and *Lembophyllum clandestinum* all appear in collections under this name.

Lembophyllum clandestinum (H.f. et W) Lindb.

Stems decumbent, elongated, branches erect simple or divided rarely pinnate. Leaves nearly orbicular, very concave, obtuse, patent imbricate, 1 mm.; margin closely ser-

1913.

ulate above; nerve none; cells short, fusiform, shorter above, longer below, very long in the middle of the lower half. Seta 1.5 cm.; curved above; capsule pendulous, oblong 1.6 mm.

Common in damp woods.

Lembophyllum divulsum (H.f. et W) Lindb.

Decumbent, vaguely branched, branches mostly erect. Leaves orbicular, very concave, divaricate 0.8 mm.; margin subserrulate to acutely serrate; nerve broad, ill-defined, vanishing about the middle; cells shortly oblong, strongly incrassate. Seta 1.3 cm.; capsule inclined, oblong, 1.7 mm.; lid convex with a short, sharp point.

Near Launceston. Slopes of Mt. Wellington, Mt. Nelson, Kingston, etc.

WEYMOUTHIA Broth.

Long, pendulous, vaguely branched, hanging from boughs of trees. Leaves semipellucid, smooth, of thin texture, concave, obtuse; nerves two, unequal, obscure; cells long, vermiform, incrassate, those at the basal angles usually quadrate. Seta lateral, rather short, smooth, flexed; capsule small, oblong to subglobose, inclined; lid convex, mamillate, shining, peristome double; exostome teeth yellow, long slender, commissural line faint; endostome 1-3 membrane, processes slender perforate as long as exostome, cilia none.

Leaves oblong patent *molle*.

Leaves subrotund divaricate *Billardieri*.

Weymouthia molle (Hedw.) Broth.

Syn: *Pilotrichella molle* Hampe, *Meteorium molle* (Hedw.).

Slender with short distant branches. Leaves broadly oblong, concave, patent, 1.8 mm.; margin faintly subserrulate; apex very obtuse or retuse, the cells at the tip oblong and a well-defined patch of roughly quadrate cells at the angles. Nerves two, short, unequal, faint, or none. Perichaetia narrow sheathing nearly as long as the seta. Seta 4-5 mm., capsule inclined tapering at the neck, 1 mm.

St. Helens, Uxbridge, Bismarck, etc.

Weymouthia Billardieri (Hpe.) Broth.

Syn: *Pilotrichella Billardieri* Hpe.

When growing on tree trunks elongated pinnate with short rather regular branches, on tree branches it assumes a pendulous habit, on the ground it is more vaguely branched, generally terminating with slender flagella. Leaves

divaricate, broadly oblong or subrotund, very obtuse, 2.2 mm.; margin subserrulate; nerves two very faint; cells linear, towards the apex oblong, a patch of ill-defined oblong cells at the angles. Perichaetials sheathing, only a little longer than the other leaves. Seta 1 cm., curved, capsule 1.2 mm. oblong.

George River, Gordon, Sandfly.

CAMPTOCHAETE Reichardt.

Stems erect from a creeping rhizome with irregular simple or pinnate branches, commonly dendroid. Leaves patent, or more or less complanate, concave, smooth, glossy, not plicate, with 2 obsolete nerves or nerveless, cells vermiform, those at the extreme base shorter, without enlarged cells at the angles. Seta not long, with a sygmoid curvature. Capsule cernuous, smooth, oblong-cylindric, tapering at the neck; calyptra long, slender, cucullate; lid broad, shortly conic, apiculate; exostome pale, teeth lanceolate connected at the base; endostome rather longer, with a connecting membrane for nearly half the length, cilia small or none.

Leaves orbicular *arbuscula*.

Leaves ovate, acuminate.

Leaves patent *ramulosa*.

Leaves complanate *deflexa*

Leaves ovate, subobtuse.

Leaves erecto-patent *gracile*.

Leaves squarrose *tasmanica*.

Camptochaete arbuscula (Sm.) Reich.

Syn: *Isohecium arbuscula* Hook.

Stems erect, dendroid, usually 10-15 cm., branching pinnate simple but with some of the lateral branches sometimes bold and also pinnate. Leaves nearly orbicular, apiculate, margin entire or obscurely dentate, with two short, very faint nerves, 1.7 mm. long; perichaetials sheathing, longer and acute. Capsule oblong to cylindric 2 mm.

Common in damp shaded woods.

Camptochaete ramulosa (Mitt.) Reich.

Syn: *Porotrichum ramulosum* Mitt.

Stems erect or suberect, dendroid, copiously and irregularly branched above, 8-10 cm. Leaves sub-complanate when dry, equally placed when moist, ovate, acuminate, serrulate, nerves faint or none, 1.5 mm. long; perichaetials

1913.

longer, sheathing, with a slender apex. Capsule arcuate, 2 mm., oblong-cylindric.

Gullies on lower slopes of Mt. Wellington.

Camptochaete deflexa (Mitt.) Reich.

Syn: *Porotrichum deflexum* Mitt.

Stems dendroid, erect, irregularly branched, above, 7 cm. Leaves complanate, ovate, acuminate, suberrulate above; nerves faint or none 1-1.4 mm. Perichaetials longer with a more acute apex. Capsule bent 1.7 mm.

Very close to *C. ramulosa*, but leaves more complanate and smaller. Some forms appear intermediate.

Common in damp gullies.

Camptochaete gracile (H.f. et W.) Reich.

Syn: *Porotrichum gracile* Mitt.,

Isothecium gracile H.f. et W.

Small, suberect or decumbent, matted 3 cm., the simple branches irregularly inserted. Leaves erecto-patent, oblong, surface smooth, base narrow, apex obtuse or subacute, margin serrulate; nerves very faint or none, 0.8 mm. Perichaetials sheathing rather longer, subacute. Capsule bent, 1.3 mm.

Camptochaete tasmanica Broth.

Decumbent, elongated and irregularly branched very slender 2-5 cm. Leaves squarrose, minutely papillose on the external surface, oblong, concave, subobtuse, 0.8 mm., serrulate above; nerves two, faint. Rest not seen.

Distinguished from *C. gracile* by looser habit and squarrose leaves.

In water, Western Tiers.

PAPILLARIA C.M.

Elongating pendulous, on branches. Branching irregular. Leaves plurifarious, closely set, imbricate, acute; nerve single vanishing above the middle; cells oblong to fusiform, surface of the greater portion of the leaf more or less papillate. Seta from the base of the lateral branches, about 1 cm.; capsule small, broadly oblong, erect; lid obliquely conic; calyptra very short cucullate, clothed with a few erect hairs; peristome double, exostome teeth papillose, lanceolate, rather obtuse; endostome membrane shallow, processes papillose, filiform, imperforate; cilia none. Leaves with very large auricles.

Branches robust with flagellate tips; papillae nodulose

... .. *flavo-limbata*.

Branches slender; papillae minute and few ... *intricata*.
Leaves with small auricles.

Auricles dentate ... *kermadecensis*.

Auricles obtusely papillate ... *filipendula*.

Papillaria flavo-limbata (Hpe. et C.M.) Par.

Syn: *Meteorium cerinum* H.f. et W.

Branches rather robust with closely overlapping yellowish leaves, often ending in filiform flagella. Leaves of main branches broadly ovate-lanceolate from a broad cordate or auricled base, acute, 2 mm.; margin irregularly serrate along the auricle, entire or nodulose above; nerve rather bold, lost in the upper third, surface smooth at the base and partially so towards the margin, elsewhere the cells with 4 or 5 closely nodulose papillae; cells oblong, rather longer below.

George River, Upper Meander River.

Papillaria intricata (Mitt.) Jaeg.

Slender, with rather numerous short cuspidate branches, usually brownish-yellow. Leaves erecto-patent, imbricate, with a very broadly auricled base and tapering acute apex, 1.5 mm.; margin irregularly toothed on the auricles, more obscurely so above; nerve faint vanishing in the upper third; cells fusiform; surface with few very minute nodules on the cells in the middle of the leaf.

East Tamar.

Papillaria Kermadecensis C.M.

Slender, very long, filiform with short branches at intervals. Leaves erecto-patent, imbricate, broadly ovate-lanceolate, the base rather cordate or auricled, apex of lower leaves with a subacute to acute flexed tip, upper leaves obtuse, 1.5 mm.; margin dentate below nearly plain above; nerve well-defined, canaliculate, lost below the apex; cells irregularly oblong, those of the auricles smooth, smaller and rounder; most of the leaf closely covered with minute nodulose papillae.

West Tamar.

Papillaria filipendula (H.f. et W.) Jaeg.

Syn: *Meteorium filipendulum* H.f. et W.,

M. flexicaule. Mitt.

Long, slender, with distant, filiform branches. Leaves erecto-patent, imbricate ovate-lanceolate, base not broadly auricled, apex subobtuse, 0.8 mm.; margin with minute

1913.

obtuse papillae; nerve slender, faint, lost above the middle; cells oblong, rather longer towards the base; surface of the middle of the leaf covered with very minute nodules.

East Tamar, Gould's Country.

DENDROCRYPHAEA Par. et Schimp.

Suberect, simple, or with few, very short, barren branches. Leaves oblong or ovate, plurifarious, patent, imbricate, subacute; nerve lost below the apex, cells rather small, rhomboid, incrassate, becoming longer towards the base. Perichaetials long, acute. Fertile branches usually numerous, short, lateral; capsule sessile, immersed in the perichaetials, oblong with a narrow base, wide mouth and thick ring; calyptra small, mitriform; lid conic; peristome double, exostome teeth erect, narrow lanceolate sub-obtuse, smooth, articulations distant; endostome membrane very short, processes filiform exceeding the exostome.

Dendrocryphaea tasmanica (Mitt).

Syn: *Cryphaea tasmanica* Mitt.

Growing in masses on occasionally submerged rocks in streams. Stems suberect, 3-8 cm., lateral branches very short. Leaves very broadly ovate from a rather narrow base, margin subserrulate; apex subacute, imbricate 2 mm.; perichaetials 3-4 mm., linear, acute. Capsule dark red 0.7 mm.

Upper reaches of the Meander.

CRYPHAEA Mohr.

Suberect, slender, with many simple, lateral branches. Leaves ovate from a narrow base, apex slender acuminate, nerve slender, lost above the middle; cells small rhomboid. Perichaetials long and slender. Fertile branches lateral, very short; capsule sessile immersed in the perichaetium, narrow oblong; calyptra short mitriform; lid erect, conic; peristome double, exostome teeth slender papillose, endostome membrane very short, processes filiform papillose, shorter than the exostome, cilia none.

Cryphaea parvula Mitt.

Stem very slender 2-3 cm., branches many. Leaves ovate with a very acute apex, 1.2 mm.; margin plain; nerve narrow, lost in the attenuated apex. Perichaetials slender 3 mm.; capsule broadly cylindric 2 mm.

On branches of shrubs, slopes of Mt. Wellington; Coal River Tier.

RHABDODONTIUM Broth.

Habit elongated, procumbent, growing on the branches of trees, with few irregular or many short branches. Leaves imbricate, broad, nerveless, concave, smooth, cells broadly linear. Capsule sessile or nearly so, on short lateral branches, enclosed in perichaetial leaves. Exostome teeth lanceolate; endostome rudimentary; lid conic; calyptra very short, mitriform.

Rhabdodontium Buftoni Broth. et Geh.

Stems bare below, densely covered with dark green foliage above, about 10 cm. long with numerous short branches. Leaves erecto-patent, imbricate, broadly ovate, shortly acuminate, 1.3 mm., basal cells brown, margin entire. Capsule oblong 2 mm., lid short, rostrate. Perichaetial leaves pale, narrow, ovate-acuminate 2.5 mm.

Port Davey, Hartz Mountains.

NECKERA Hedw.

Stem creeping, the branches ascending or pendulous, pinnate, often elongated. Leaves in many rows but complanate, unequal, unsymmetric, ovate-lanceolate; cells small, oval to rhomboid, linear below. Capsule usually immersed in the perichaetial leaves; calyptra very short split on one side; lid with a short oblique rostrum; peristome inserted deeply inside the ring; exostome teeth lanceolate, rather long, partially bifid at the apex; endostome membrane short, the processes nearly filiform; cilia none.

Neckera hymenodonta C.M.

Stems flaccid or pendulous, branching pinnate or bipinnate, rather irregular, complanate, sometimes elongated into slender, flagellate, small leaved ends. Leaves in many rows, equal or nearly so, complanate, lateral spreading, surface with transverse, broad undulations, ovate-oblong rather oblique, slightly to very acute, 2.5-3 mm.; margin serrate above; nerves two short faint or none. Perichaetials closely enclosing the capsule, lanceolate, very acute, 4 mm. Seta under 1 mm.; capsule oblong, erect, 1.9 mm.; lid conic, oblique, rather short; calyptra short, cucullate; peristome erect, conical, teeth long linear, tapering, smooth with rather distant articulations partially split in the medium line; endostome a short membrane and very long, filiform processes; no cilia.

1913.

On tree trunks in damp gullies.

Near Launceston, New Town Creek, Mt. Wellington.

HOMALIA Brid.

Small, decumbent and stoloniferous, stem quite prostrate or suberect, pinnately branched, complanate. Leaves imbricate, inserted 8-fariously but flattened in one plane, the lateral leaves oblique, unequal sided, inflexed at the base on one side; nerve short or none; cells small, rhomboid. Seta long, slender, curved at the top; capsule ovoid, drooping; lid rostrate; calyptra cucullate; peristome double; exostome teeth narrow lanceolate; endostome membrane $\frac{1}{3}$, processes subulate; cilia rudimentary or none.

Homalia falcifolia Hook.

Branches broad 3 mm. across. Leaves pale green, glossy, crowded, oblong, with a broad, flat, falcate, obtuse apex; margin entire; nerve none. Perichaetia long, erect, narrow. Seta very slender 1.5-2 cm. arched at the top, smooth. Capsule oblong horizontal or nodding; lid short, conic.

Recorded as Tasmanian, but no Tasmanian specimen in any of the collections.

TRACHYLOMA Bridel.

Erect, pinnately branched, dendroid. Leaves complanate ovate, acute, shining; nerves one or two, short, obsolete; cells long vermiform with acute ends. Seta long slender arising from the main stem; capsule fusiform, suberect; lid long-conic; exostome teeth rather long, slender; endostome membrane very short, the processes long and slender; no cilia.

Trachyloma planifolia Bridel.

Syn: *Neckera planifolia* Hook.

Stems from a creeping base, erect, dendroid, 6-10 cm.; branches many, complanate, irregularly pinnate. Leaves bright green, shining, complanate, in six rows, the two dorsals and ventrals erect appressed, laterals patent, all about equal, ovate, lanceolate, acute, 2.5-3 mm.; margin serrate, spinulose above; nerve one or two short, obsolete. Columba Falls, George River.

LEPYRODON Hpe.

Medium, soft, with numerous erect simple stems, the lower portions of which are densely clothed with dark radicles, forming dense cushions. Leaves crowded, soft, trans-

parent, oblong; nerve obsolete, single or double, rather variable even on the same stem, but always obscure and vanishing below the middle; cells long vermiform, incrassate, broader at the base. Seta inserted below the green portion of the shoot, erect, rather long; capsule narrow, oblong, smooth, erect; lid rostrate nearly as long as the capsule; calyptra longer cucullate; exostome absent; endostome membrane short, processes rather long, lanceolate, perforate, cilia none.

Lepyrodon lagurus (Hook.) Hpe.

Syn: *Leucodon lagurus* Hook.

Pale green in soft dense cushions. Leaves delicate, broadly oblong, concave, obtuse, but with a hairlike dentate apiculus, erect, densely imbricate, shining, 3 mm.; margin obscurely serrate. Seta red, 2.5 cm.; capsule oblong, pale yellow, 3 mm.

Near summit of Mount Wellington.

GLYPTOTHECIUM Hmpe.

Medium-sized mosses, stems simple or nearly so, erect from a creeping base forming small tufts on dead wood. Leaves delicate, transparent, ovate, lanceolate acute, with two obsolete nerves or nerveless; calls fusiform incrassate, a broad band of short oblong cells on the margin from the base for some distance upwards. Seta lateral rather short; capsule erect, obovate-oblong, smooth, mouth narrow; lid rostrate; calyptra cucullate, slender; exostome teeth incurved, rather long, slender lanceolate, pale, smooth, transversely delicately striate, endostome a shallow erose membrane.

Glyptothecium sciuiroides (Hook.) Hpe.

Syn: *Cladomnion sciuiroides*, H.f. et W.

Stems erect usually 3-5 cm., generally simple, yellowish. Leaves ovate-lanceolate, acute, patent 2.5 mm.; margin irregularly dentate; nerves just visible. Seta 5 mm.; capsule 1.6 mm.; lid in some specimens shortly rostrate, in others half as long as the capsule.

Slopes of Mt. Wellington, Bellerive.

PLEUROPHASCUM Lindbg.

Habit erect simple or with few erect branches, solitary or gregarious. Leaves thin, broad, concave, nerveless; cells large, incrassate, the walls with prominent pores and nodular on the internal surface, rhomboid above, nearly

1913.

linear below, lax. Seta long, terminal; capsule large, spherical, without mouth but with a short apiculus at the apex.

The genus consists of the one rare species endemic in Tasmania. Brotherus places it close to *Lepyrodon*, but it appears to have at least equal affinity with the *Funariaceae*.

Pleurophascum grandiglobum Lindb.

Stems 2-3 cm., pale. Leaves patent, broadly obovate, concave, tipped with a flagellate apiculus, 3 mm. Seta erect 2 cm.; capsule yellow, globose 3 mm. diameter.

On Mountains towards the west; Mt. Field.

RHACOCARPUS Lindb.

Dark brown, of rather tough consistency, depressed, forming procumbent mats on rocks. Leaves oblong, plurifarious, opaque, rather harsh, brittle, nerveless, surface minutely granular; cells linear. Seta slender, erect, from the base of branches; capsule erect, nearly globose, smooth, grooved when dry, mouth thin; lid with a long oblique rostrum; calyptra cucullate; peristome none.

Rhacocarpus australis Hpe.

Syn: *Braunia Humboldtii* Schimp.

Forming extensive patches, the stems copiously branched, usually in fascicles. Leaves oblong, concave, acuminate, tipped by a long, coloured, wavy hair, 1.2 mm. exclusive of hair point; margin with small serrations, usually incurved towards the base. Seta 1.2 cm.; capsule 2 mm.

Knocklofty, Hobart, Mt. Field, Mt. Wellington.

HEDWIGIDIUM Br. Sch.

Decumbent, nearly black except the livid green tips, elongating, with few irregular, short lateral branches. Leaves erect imbricate, oblong, acuminate, acute; margin revolute; nerve none; cells small oblong, strongly incrassate, convex. Perichaetia long acute; capsule terminal, often thrust aside by growing innovations, on a very short slender seta, immersed in the perichaetia, oblong with a slightly constricted mouth, margin thin, grooved when dry, 2 mm. lid nearly flat; calyptra conic.

Hedwigidium imberbis (Sm).

Stems long, nearly simple, forming loose, livid green and black mats. Leaves oblong, subacute, without colourless

tips, 1.3 mm.: margin revolute; surface obtusely papillose; perichaetials long, oblong, thin plicate.

Common on rocks, Mt. Wellington, Mt. Nelson, etc.

HEDWIGIA Ehrh.

Stems dichotomous or irregularly branched. Leaves plurifarious, imbricate, harsh, brittle, hyaline at the tip; both surfaces closely nodulose-papillose; nerve none; cells small, oblong or quadrate, strongly incrassate, becoming linear in the centre towards the base; perichaetials longer, narrower, softer, inner ones tipped with long woolly hairs. Capsule immersed or shortly exerted on a very short terminal seta, globose to oblong; lid nearly flat; calyptra minute conic; peristome none.

Of similar habit to some *Grimmias* but without a nerve.

Hedwigia albicans (Web.) Lindb.

Stems rather wiry, depressed, forming loose mats, nearly black with livid green tips, hoary from the white leaf tips, with few vague branches. Leaves patent ovate-oblong with an acute, white apex, 1.8 mm.; margin plain serrate towards the apex. Capsule enclosed in the perichaetium, turbinate, pale brown, mouth wide, with a red annulus, 1 mm.

Common on rocks, Slopes of Mt. Wellington, Mt. Nelson, etc.

Fam. 13.—LOPHIDIACEAE.

Habit various, erect to decumbent, simple to pinnately branched. Leaves in three rows, two of which are lateral and complanate, the third row smaller, median, dorsal or ventral according to the habit of the species; nerve from obsolete to excurrent; cells rotund to oblong, medium sized. Seta long or short placed in the axil of a median leaf; lid short conic or rostrate; calyptra small mitriform rarely cucullate; peristome double; exostome of 16 slender lanceolate teeth; endostome of 16 slender processes from a basal membrane; cilia generally absent. In *Catharomnion* the exostome is absent.

A group of plants intermediate between *Neckeraceae* and *Pterygophyllaceae* best distinguished by the peculiar leafage.

RHACOPILUM. Slender, decumbent; seta long.

LOPHIDIUM. Erect, copiously pinnate, complanate.

CATHAROMNION. Pinnate, complanate, leaves with long cilia.

1913.

HYOPTERYGIUM. Erect, branches in a terminal fascicle or approximating to it.

CYATHOPHORUM. Normally simple, erect, leaves broadly spreading.

RHACOPILUM Palisot.

Slender, elongating with few vague branches, decumbent closely attached to the ground by bunches of purple rhizoids. Lateral leaves oblong with an obtuse to acuminate apex; nerve excurrent as a slender hair point; median leaves dorsal, zig-zag, lanceolate from a broad base, nerve long excurrent; cells irregular, quadrate to oblong. Seta long, smooth; capsule inclined, curved, cylindric, furrowed, mouth wide, oblique; lid rostrate, oblique; calyptra narrow, cucullate, smooth or hairy; exostome teeth lanceolate, with long filiform ends; endostome shorter, processes short from a deep basal membrane, imperforate, cilia none.

The long seta and cucullate calyptra are suggestive of *Hypnaceae*. The phyllotaxis and cells are the only claims for its inclusion in this family.

Rhacopilum cristatum H.f. et W.

Branches often 6-10 cm. long. Lateral leaves ovate-oblong, oblique, surface very obtusely papillose. 1 mm.; apex from obtuse to shortly acuminate; margin serrulate above; cells small irregularly quadrate. Seta slender 2 cm.; capsule pale, 2.3 mm.; calyptra with a few hairs or smooth.

Very common in woods.

Rhacopilum strumiferum C.M.

Syn: *Rhacopilum australe* H.f. et W.

Similar to the last. Leaves distant, ovate-oblong, oblique, shortly acuminate, 0.7 mm.; margin serrulate above; cells oblong-hexagonal, thin walled. Seta 1.5 cm., rather stout; calyptra clothed with erect hairs.

Slopes of Mt. Wellington, Cheshunt.

LOPHIDIUM Bridel

Tall, erect, dendroid from a creeping base, outline ovate, branches from the base complanate. Leaves of the branches trifarious, two lateral rows distichously arranged, the ventral row smaller, appressed; cells rotund, rather lax. Seta arising indifferently anywhere along the stem or on a branch, rather short, capsule oblong, erect; lid rostrate; calyptra long mitriform; exostome pale, 16 teeth, lanceolate, acute, closely trabeculate on the inner surface;

endostome 16 rather bold acute processes arising from a short-base, as long as the exostome.

Often treated as a sub-genus of *Hypopterygium*.

Lophidium pallens H.f. et W.

Stems erect copiously branched, 10-12 cm., branches and lateral leaves complanate. Lateral leaves ovate-oblong, apiculate, 1.8 mm.; margin bordered, serrate in the upper part; nerve vanishing at the apiculus; ventral leaves much shorter, ovate nerve running through the longer apiculus. Seta straight or curved 5 mm.; capsule 1.8 mm., lid nearly as long.

Common on bark of trees in forests.

Mt. Wellington, Tasman's Peninsula, Maria Island.

HYPOPTERYGIUM Brid.

Stems erect, short, dendroid, branches in an irregular terminal fascicle. Leaves trifarious, those on the stem equal, on the branches complanate; two lateral rows distichous; nerve vanishing above the middle; cells rather large rotund; ventral row smaller, appressed. Seta erect, arising just above or about the lower branches; capsule pendulous, pyriform with a constricted neck or broadly oblong; mouth broad; peristome of 16 bold lanceolate teeth; endostome same length, lower third membranous with 16 perforated processes. Lid rostrate. Calyptra long with a short mitriform base.

Hypopterygium novae-zelandiae C.M.

Stem 2 cm.; branches 1-1.5 cm., yellow green. Lateral leaves patent, distichous, ovate acute, 0.8 mm.; margin bordered, acutely serrate above; ventral leaves rotund, much smaller, the nerve excurrent. Seta 1 cm.; capsule broadly oblong, pale brown, granular, 2 mm.; lid very long, curved usually exceeding the capsule.

Slopes of Mt. Wellington, Gordon, Interlaken, etc.

CATHAROMNION H.f. et. W.

Erect or depressed; stems elongated, bristly, pinnately branched or the branches falsely fasciculate. Lateral leaves oblong, complanate, bordered with long cilia; nerve slender vanishing above the middle; cells regularly hexagonal to rhomboid; ventrals very small. Seta rather short; capsule oblong, suberect; lid rostrate; calyptra mitriform, inflexed and laciniate at the base. Exostome absent; endostome processes subulate, papillose connected at the base by a very short membrane.

Close to *Hypopterygium*.

1913.

Catharomnion ciliatum (Hedw.) H.f. et W.

Stem 2-3 cm. radiculose below, pinnately branched above, branches crowded. Leaves pale green, mixed with bristles, distichous, orbicular, ovate-acuminate; ventrals much smaller ovate-lanceolate acuminate.

Not present in any available collection; possibly recorded in error. The above description constructed from Hooker's Handbook and Brotherus in Pflanzenfamilien.

CYATHOPHORUM Brid.

Stems erect from a creeping rhizome, normally simple and quite unbranched. Lateral leaves complanate, widely spreading, nerve obsolete; ventrals small orbicular closely appressed; cells rhomboid lax; perichaetials small, narrow, few. Seta short, stout; capsule broadly oblong, erect; lid convex with an acutely sharp rostrum; calyptra short, mitriform; peristome double, pale; exostome teeth lanceolate broad, not very slender, closely trabeculate; endostome membrane short, processes lanceolate, cilia usually 3.

Cyathophorum bulbosum (Hedw.) C.M.

Syn: *Cyathophorum pennatum*, Brid.

Stems robust, often 10 cm. or more; sometimes only 3 cm., rarely bearing a few lateral branches. Lateral leaves broadly spreading, ovate-oblong acute, 7 mm.; margin plain below, spinulose above; nerve rather obscure, vanishing below the middle, cells lax averaging $120 \times 30\mu$. Ventrals orbicular or oblong, apiculate. Perichaetials few, lanceolate, acute. Seta 3 mm.; capsule brown 2 mm.

Very common in damp forests.

Cyathophorum densirete Broth.

Closely resembling the small forms of *C. bulbosum*, only the foliage stiffer and less transparent. Lateral leaves ovate, more acute, 4 mm.; margin spinulose above; nerve shorter and fainter; cells shortly rhomboid about $100 \times 27\mu$. Perichaetials rather longer. Fruit not differing.

Slopes of Mt. Wellington, Southport, Mt. Bischoff, etc.

Fam. 14—PTERYGOPHYLLACEAE.

Small to medium sized mosses, decumbent to erect, with few vague branches. Leaves usually in 8 rows with a strong tendency to become complanate, generally broad and soft, smooth, nerved or not; cells generally rotund to hexagonal, rarely fusiform. Seta lateral, long, capsule inclined oblong to pyriform; lid rostrate; calyptra mitriform; peristome

double, the exostome teeth 16, the two legs cartilaginous, only connected by a thin membrane; endostome membrane deep, processes lanceolate acute about the same length. Cilia none.

A natural group chiefly distinguished by the leaf texture and habit. It has affinity with *Lophidiaceae* and more distantly with *Mniaceae*.

SAULOMA. Leaves lanceolate shining; cells fusiform. Calyptra with a torn base.

DALTONIA. Leaves lanceolate; cells narrow rhomboid. Calyptra with a fringed base.

ERIOPIUS. Leaves broad; cells rotund. Seta rough or strigose. Calyptra fringed.

DISTICHOPHYLLUM. Leaves broad; cells rotund. Seta smooth. Calyptra fringed or not.

PTERYGOPHYLLUM. Leaves broad, not bordered, acutely toothed, cells large, nerve forked. Calyptra with a plain base.

SAULOMA H.f. et W.

Small, depressed or erect in dense cushions. Leaves lanceolate, acute, plurifarious, margin revolute; nerve none; cells lax, fusiform, a few at the extreme base quadrate. Seta slender smooth; capsule small ovoid; lid rostrate; calyptra large smooth, regular or torn at the base, not fimbriated; peristome typical.

Sauloma tenella H.f. et W.

Syn: *Hookeria tenella* H.f. et W.

Depressed or suberect, green or yellow, stems about 1 cm. Leaves erect, imbricate, broadly lanceolate, acute, shining, 2 mm. Seta 1 cm.; capsule erect, oblong 1.2 mm.

Slopes of Mt. Wellington, Geeveston, Coal River Tier, etc.

DALTONIA H.f. et Tayl.

Very small, erect, tufted. Leaves lanceolate; nerve vanishing above; cells linear-rhomboid. Seta slender, often papillose, capsule erect, oblong; lid conic-rostrate; calyptra copiously hairy; exostome teeth very slender, finely papillose; endostome base very short, the processes long, slender, papillose converging in a cone when dry.

Daltonia pusilla H.f. et W.

Stem seldom exceeding 5 mm. Leaves erect, acute, 2 mm.; margin with a narrow thickened border, involute; nerve canaliculate, vanishing at a distance from the apex.

1913.

Seta slender; capsule oblong, 1 mm.; lid acute, as long as the capsule.

On twigs and fern leaves in damp gullies. Slopes of Mt. Wellington, Gordon, etc.

ERIOPIUS Mitt.

Small, tufted with few simple branches. Leaves in five rows, complanate; the two dorsals, and one ventral rather smaller than the lateral rows, broadly elliptic to orbicular, apiculate, broadly bordered by a band of 4-5 linear incrassate cells; margin entire or serrate; nerves 2, faint or obsolete, very short; cells large hexagonal. Seta rather stout, flexed, clothed with delicate hairs, strigose or almost smooth; capsule small, oblong, mouth not much contracted, rim thick, base tapering; lid conic acute, nearly as long; calyptra acute densely fimbriated, short; peristome typical.

Eriopus apiculatus H.f. et W.

Pale livid green, 2-3 cm. Leaves nearly orbicular, laterals about 2.5 mm.; margin entire, obtusely serrulate or a few serrations on the upper ones; border very broad; cells nearly equal $33 \times 30\mu$. Seta shortly strigose, 1 cm.; capsule inclined, neck very tapering.

Circular Head, Slopes of Mt. Wellington, Cape Frederick Henry, etc.

Eriopus tasmanicus Broth.

Very close to the last; bright green. Leaves broadly obovate, 1.8-2.4 mm., margin with a narrower border, sharply dentate; cells more oblong. Seta coarsely strigose, 1-1.5 cm.; capsule broadly oblong, less tapering; calyptra more hairy.

Wet gullies Mt. Wellington.

DISTICHOPHYLLUM Doz. et Molk.

Densely tufted; stems flat, decumbent, with few vague branches. Leaves in eight rows partially complanate, the dorsal and ventral leaves little smaller, oblong spathulate, usually with a border of few linear incrassate cells; nerve single, slender, vanishing above the middle; cells small quadrate or hexagonal mostly $12-20\mu$, lower ones longer. Seta long, smooth; capsule oblong, inclined, with a small distinct globose apophysis; lid conic to rostrate; calyptra long mitriform with a fringed base except in *D. microcarpum*. Peristome typical except that the endostome membrane is short.

The genus contains two groups.

DISCOPHYLLUM. Leaves bordered, crisped when dry. Calyptra with a fringed base.

Apex apiculate.

Margin serrate *rotundifolium*.

Margin distantly serrulate *crispulum*.

Margin plain *pulchellum*.

Apex obtuse *amblyophyllum*.

MNIADELPHUS. Leaves not bordered; not crisped when dry. Base of calyptra not fringed *microcarpum*.

Distichophyllum rotundifolium (H.f. et W.).

Small, seldom exceeding 3 cm., freely branched. Leaves complanate, patent, broadly oblong-spathulate, rather crisped when dry, 1.2 mm.; margin serrate; apex with a small apiculus which is continuous with the border. Seta 1 cm.; capsule narrow oblong, 1 mm.; apophysis half as long; calyptra deeply fringed at the base and with a few erect hairs at the apex.

Damp gullies, Mt. Wellington, Zeehan.

Distichophyllum crispulum (H.f. et W.).

Small, decumbent, stems about 2 cm. Leaves oblong from a narrow base, 2 mm., apex apiculate, border very narrow, lost below the apiculus; margin sinuate, distantly serrulate above. Seta very slender, 5 mm.; capsule inclined cylindric, 1 mm.; lid conic, half as long.

Mt. Wellington, Leith's Creek.

Distichophyllum pulchellum (H.f. et W.).

Stems usually under 1 cm. Leaves crowded, broadly obovate-spathulate of firmer texture than other species, little crisped when dry, 1.2 mm.; margin plain, bordered, apex with a short acute apiculus. Seta 7 mm.; capsule suberect, broadly oblong, 1 mm.

Upper reaches of Meander River.

Distichophyllum amblyophyllum (H.f. et W.).

Stems elongated, often 5 cm., with few vague branches. Leaves pale green, becoming livid, oblong-spathulate, imbricate, much crisped when dry, 2 mm.; margin plain, undulate, bordered; apex very obtuse, rarely apiculate. Seta 4 cm.; capsule broadly oblong, 1.4 mm.; apophysis half as long.

D. sinuosum, H.f. et W., is simply a form of this with leaves more crowded and slightly unequal. It differs in no anatomical detail.

1913.

D. subsinuosum, C.M., is only a slightly more robust form due to favourable conditions.

Slopes of Mt. Wellington, West Coast, etc.

Distichophyllum microcarpum (Hedw.).

Livid green in mats or pendulous; stems flat, thick, fleshy 3 cm., but on dripping rocks elongating to 15 cm. Leaves oblong-obovate, very obtuse, 2-3 mm. more complanate than in the other species and not crisped when dry; margin plain unbordered, marked by collapsed cells when dry; nerve vanishing above the middle, upper cells 12μ . Seta slender dark 1 cm.; capsule inclined, ovate with a thickened neck, 1 mm.; lid conic, shorter than capsule; calyptra rather long, rough, base torn not fimbriated. Intermediate between *Distichophyllum* and *Pterygophyllum*.

Geheeb described a robust specimen as *D. Levieri*.

Mt. Wellington, Ida Bay, Grass Tree Hill, etc.

PTERYGOPHYLLUM Brid.

Decumbent or ascending, simple or with few vague branches, of more tender consistency than most mosses, becoming very distorted when dry. Leaves in five rows or fewer, all strongly complanate, the laterals patent, the dorsals and ventrals smaller and closely appressed or sometimes all nearly equal, broad, not bordered, margin dentate; nerve short, forked; cells large rotund to hexagonal, larger towards the base. Seta smooth; capsule usually pendulous, oblong to pyriform; lid with a long rostrum; calyptra constricted at the base, plain, often irregularly split. Peristome typical.

The species are variable and the division is arbitrary. Robust. Lateral leaves 5 mm. or more *Hookeri*. Less robust. Lateral leaves smaller.

Cells hexagonal *denticulatum*.

Cells rotund *nigellum*.

Pterygophyllum Hookeri Jaeg.

Robust, stems fleshy, flat, often 5 cm. dark green. Lateral leaves oblong-obovate, of thin texture, 5 mm., margin coarsely toothed; nerve rather bold brown, forked, vanishing above the middle; cells hexagonal about 66μ . Seta 3-5 cm., capsule inclined or pendulous, oblong or pyriform with a rather abrupt neck 1.5 mm.; lid as long as the capsule; calyptra longer, irregularly torn at the base.

Common in damp gullies.

Pterygophyllum denticulatum (H.f. et W.) Mitt.

Suberect, 3 cm. dark green. Lateral leaves obovate from a narrow base, 3 mm.; margin strongly dentate; nerve bold, brown forked, vanishing about the middle; cells hexagonal, about 54μ . Seta rather slender, 1 cm.; capsule broadly oblong to nearly globose, pendulous, 1.2 mm., neck abrupt; lid conic, half as long as the capsule.

In damp gullies. Common.

Pterygophyllum nigellum (H.f. et W.) Jaeg.

Slender, often elongated. Leaves distant, usually in three rows, nearly equal, dark green, drying black, obovate from a narrow base to nearly orbicular, 2-3 mm.; margin coarsely dentate above; nerve forked, vanishing in the middle; cells rotund, $40-50\mu$. Seta 1.5 cm.; capsule oblong-pyriform, pendulous; apophysis obconic, curved, length without the apophysis 1.2 mm.; lid as long as the capsule.

Restoring very poorly after being dried.

Very common in damp gullies.

Fam. 15—POLYTRICHACEAE.

Erect, usually simple, the stem strong and hard. Leaves usually very firm and rigid, narrow; nerve bold, often broad; upper surface bearing few or many longitudinal lamellae. Fruit terminal on a long seta; capsule round, flat on one side, or four angled; lid conic or rostrate; calyptra narrow cucullate, sometimes copiously covered with long hairs, giving it a mitriform appearance. Peristome of 32 or 64 very short simple teeth not divided by cellular partitions and joined above to a membranous disc except in *Dawsonia* where the numerous teeth are slender long and free. Androecia in a terminal disc.

A well-defined group not bearing apparent affinity with any other family.

CATHARINEA. Leaves soft with few lamellae on the upper surface, crisping when dry.

PSILOPILUM. Leaves rigid, lanceolate; capsule oblong smooth; calyptra bare or nearly so. Peristome teeth 32.

POGONATUM. Leaves rigid, lanceolate; capsule oblong, smooth; calyptra clothed with long hairs. Peristome teeth 32.

POLYTRICHADELPHUS. Leaves very narrow, acute; capsule flat on one side, smooth; calyptra bare. Peristome teeth 64.

1913.

POLYTRICHUM. Leaves very narrow, acute; capsule four angled or smooth; calyptra densely hairy. Peristome teeth 64.

DAWSONIA. Habit of *Polytrichum*, but seta short, and peristome a brush of long hair-like teeth.

CATHARINEA Ehrh.

Stems erect from a creeping rhizome. Leaves ligulate or oblong, softer than in most of the genera, bordered and serrate at the margin, bearing few lamellae on the upper surface. Capsule narrow oblong or cylindric, slightly bent; lid with a long beak; calyptra narrow, spinulose only at the apex; peristome teeth 32, ligulate, rigid, attached by the apex to a discoid expansion arising from the columella.

Distinguished from the rest of the family by the less rigid leaves.

Catharinea muelleri Hpe. et C.M.

Syn: *Polytrichum angustatum*, Hook.

Stems 2-3 cm. Leaves pale green, ligulate, spreading, about 8 mm., plain but much crisped when dry; margin limbate, strongly serrate; apex sub-acute; nerve slender serrate beneath, bearing three or four lamellae above, vanishing at the apex. Seta slender, sometimes more than one together at the apex of a shoot; capsule cylindric erect or inclined, 5mm. Lid with a slender beak nearly as long as the capsule.

Very common on clay banks, chiefly on hill sides.

PSILOPILUM Brid.

Small, erect. Leaves rigid, lanceolate; nerve not very broad; upper surface with dense short lamellae. Capsule oblong, mouth constricted; lid rostrate; calyptra smooth or nearly so; peristome 32 short teeth attached above to a disc.

Leaf margin plain *australe*.

Leaf margin dentate *crispulum*.

Psilopilum australe (H.f. et W.) Jaeg.

Syn: *Polytrichum australe* H.f. et W.

Erect 2-3 cm. Leaves erecto-patent, short, rigid, broadly lanceolate from a broad sheathing hyaline base, subacute 3-4 mm. inclusive of base; margin plain; nerve not very broad, upper surface densely lamellated. Seta 4 cm., capsule inclined, oblong, smooth, mouth constricted 3-4 mm.;

lid with a slender rostrum ; calyptra bare except a few short hairs at the apex.

Summit Mt. Wellington, Western Tiers.

Psilopilum crispulum (H.f. et W.) Jaeg.

Syn: *Polytrichum crispulum* H.f. et W.

Erect, usually under 2 cm. Leaves erecto-patent, short, rigid, lanceolate from a sheathing hyaline base, not as broad as in *P. australe*, 3 mm., acute ; margin dentate ; nerve not very broad ; upper surface lamellate but not as strongly so as in *P. australe*. Seta 2 cm. ; capsule broadly oblong, mouth constricted 2.5-3 mm.

Western Tiers.

POGONATUM Beauv.

Erect, rigid. Leaves lanceolate, sub-acute, not very rigid ; nerve not broad, upper surface covered with numerous lamellae. Capsule erect or inclined oblong, mouth not constricted, round in section ; lid beaked ; calyptra densely covered with long silky hairs which descend and completely enclose the capsule ; peristome teeth 32.

Pogonatum australasicum, Hpe. et C.M.

Stems 3-6 cm. Leaves lanceolate, subacute not very rigid, upper surface except the base and a narrow margin densely covered with lamellae, 5 mm., margin strongly serrate ; nerve not broad vanishing in the apex. Capsule oblong, inclined, smooth, 3 mm., lid with a bold rostrum, 1 mm. ; calyptra brown above, pale in the lower part.

In Australian records often referred to *P. tortile*, Palis.

Very common on hillsides.

POLYTRICHADELPHUS Mitt.

Stems erect, seldom branched, rigid. Leaves with a very short sheathing, broad, hyaline base and a rigid divaricate lamina ; nerve very broad densely covered on the upper surface with lamellae. Seta long ; capsule oblong, inclined, flattened on the upper surface ; peristome of 64 short teeth ; lid beaked, calyptra nearly hairless.

Polytrichadelphus Magellanicus (Hedw.) Mitt.

Syn: *Polytrichum Magellanicum* Hedw.

Erect, simple, rigid, 3-5 cm. Leaves rigid, patent, 5 mm., the lamina except a narrow margin composed entirely of thickened nerve ; margin strongly serrate ; apex acute. Capsule inclined broadly oblong, flattened above,

1913.

gibbous beneath, 3 mm.; lid with a rather slender beak, 2 mm.; calyptra long, base broad, apex with short erect hairs otherwise smooth.

Very common in shady places.

POLYTRICHUM Dill.

Robust, rigid, erect, tall and usually unbranched. Leaves rigid, the base thin and stem-clasping, lamina slender, acute; nerve very broad, densely lamellated on the upper surface. Capsule broad, in typical forms four angled and carrying a discoid apophysis at the base; lid rostrate; calyptra densely clothed with descending hairs; peristome of 64 very short teeth.

Capsule angled; apophysis present.

Margins of leaves sharply incurved *juniperinum*

Margins serrate not incurved *commune*

Capsule round; no apophysis *alpinum*

Polytrichum juniperinum Willd.

Leaves with a sheathing rather broad base and divaricate slender lamina with a narrow smooth sharply incurved margin, apex very slender, 6 mm., with few serrations or plain. Capsule prominently four-angled 4 mm.

Very common in all situations.

Polytrichum commune L.

Stems 6-10 cm. Leaves slender 5 mm. tapering to an acute apex, lamina composed almost entirely of the broad nerve; margin serrate not incurved. Capsule oblong, boldly four-angled; lid with a very short rostrum.

Latrobe, Zeehan, Adamson Peak.

Polytrichum alpinum L.

Erect, simple, generally 5-6 cm., the lower portion bare. Leaves with a short broad hyaline base and divaricate subulate lamina up to 10 mm., apex very acute, nerve composing nearly the whole breadth densely lamellate on the upper, spinulose on the lower surface; margin coarsely dentate. Seta 4-6 cm.; capsule inclined, ovate-cylindric, about 4 mm.; smooth; lid with a slender rostrum nearly as long as the capsule; calyptra short, copiously hairy; peristome of 64 very minute teeth.

Intermediate between *Polytrichum* and *Pogonatum*.

High altitudes Western Mountains.

DAWSONIA R. Br.

Erect, rigid, robust, simple or rarely branched. Leaves

rigid, narrow, with a short, broad, sheathing base, nerve broad; upper surface densely covered with short erect lamellae. Capsule flattened on the upper surface, mouth small, bearing a peristome of numerous long erect simple hairs free at the apex.

Dawsonia superba Grev.

Very tall, 20 cm. Leaves lanceolate, patent, 20 mm., acute, margin with spinulose teeth. Seta stout shorter than the terminal leaves. Capsule obovate, inclined, flattened on the upper surface, 8 mm., mouth 1.3 mm., peristome pale, 3.5 mm.

Near Ulverstone, North West Coast.

Fam. 16—BUXBAUMIACEAE.

The plants are very small, stems very short and leaves rudimentary. Capsule on a relatively stout, erect seta, oblique, flattened on the upper surface, gibbous on the lower; calyptra minute conic; lid minute, conic; peristome of one or several series of small, linear teeth; endostome of a 32-plicate membrane in form of a twisted truncate cone.

The family consists of but one genus and that of but three or four species. They are rare and sporadic in their appearance, their small size greatly assisting their escape from observation. The peristome teeth being without cross septa appears to indicate relationship to *Polytrichaceae*, otherwise they seem to have no close affinity to other mosses. Probably of reduced form in response to a saprophytic habit.

BUXBAUMIA Haller.

Very small, erect, scattered. Leaves extremely minute, broadly ovate or oblong, coarsely serrated, or laciniate, colourless; cells large, oblong. Male plants very minute, few leaved and with one or two subglobose antheridia. Female plants very small with 10-12 bract leaves.

Buxbaumia tasmanica Mitt.

Probably not distinct from *B. indusiata*, Brid., but no specimen is present in any available collection. It was gathered by Mr. Archer at Cheshunt in the middle of last century.

Fam. 17—ANDREACEAE.

Small dark (red, brown, black, rarely greenish) mosses growing in dense cushions. Stems short to medium and slender, branches few, vague. Leaves small, more or less

1913.

imbricate, in most instances cartilaginous; nerved or nerveless; margin entire; surface papillose or smooth; cells small rotundo-quadrate, strongly incrassate, those at the base rectangular to linear. Sporogonium terminal, subsessile on an elongated peduncular extension of the axis, lidless and opening by splitting from the apex to the base into four or more sections; calyptra small mitriform.

The family has no close affinity to any other group. The leaf tissue is rather similar to *Hedwigia* and allies. The elongation of the axis to function as a seta is only met with otherwise in *Sphagnaceae*. The splitting of the capsule to allow exit of spores is found in no other moss but is usual amongst Hepatics to which the family has no relationship.

ANDREAEA Ehrh.

This, the only genus, is sufficiently defined in the description of the family. The species are mostly found on rocks at a considerable altitude. All the Tasmanian forms have enlarged perichaetial leaves, the capsule has four incisions but the segments then formed do not separate at the apex.

The species vary considerably and it is simply a matter of opinion into how many species the forms should be grouped.

Leaves ovate-lanceolate, obtuse to acute, margin involute, nerveless, coarsely papillose externally. (*Petrophila* group.)

Leaves ovate-lanceolate, patulous, base sheathing, upper leaves often longer and falcate *petrophila*.

Leaves broadly ovate, acuminate, geniculate from a broad sheathing base *acuminata*.

Slender with many branches. Leaves narrow acute, squarrose *tenera*.

Leaves narrow, dark, clustered at apex, thin texture, coarsely papillose *eximia*.

Leaves concave, incurved, obtuse, lower leaves small, very obtuse *amblyophylla*.

Leaves more or less shining. Nerveless.

Leaves with a short acuminate apex *montana*.

Leaves obtuse *nitida*.

Leaves long narrow with a bold nerve *subulatissima*.

Andreaea petrophila Ehrh.

Syn: *Andreaea julicaulis* C.M.

Tall, red, few branched, to short and pulvinate. Leaves ovate-lanceolate from a sheathing base, geniculate, sub-acute 0.7 mm., in some forms the upper leaves longer and

falcate, external surface strongly papillose, cells rotund strongly incrassate 6μ , nerveless. Perichaetials much longer. Capsule exserted, with a broad pale band at the base.

Very common on mountains.

Andreaea acuminata Mitt.

Syn: *Andreaea erubescens* C.M.

Red-brown in dense cushions. Stems 1 cm. in dry, to 3 cm. in shaded places. Leaves crowded, base broad, sheathing, colourless, lamina geniculate at the base; patent, in curved above, ovate, acuminate, concave 0.5-0.7 mm. the wings at junction of base and lamina crenate and much incurved, external surface bearing short obtuse papillae; nerveless; cells rotund, strongly incrassate $5-6\mu$. Perichaetials much longer. Capsule immersed.

Differs from *A. petrophila* in the broader leaf.

Common on mountains.

Andreaea tenera C.M.

Stems very slender with many branches in the upper part or in dry situations shorter and pulvinate, greenish-brown, at least towards the apex. Leaves patent, geniculate from a sheathing base, incurved towards the apex, narrow lanceolate, acute, margin involute, 0.7 mm., nerveless, external surface obtusely papillose; cells some rotund others oblong, $8-8 \times 16\mu$, long rectangular in the centre base. Perichaetials slender 1.5-2.5 mm. Capsule included or exserted with a broad white base.

Besides habit the leaf-structure is very distinct.

Summit of Mt. Wellington.

Andreaea eximia C.M.

Stems short, black, the lower part nearly bare, the leaves clustered at the apex. Leaves linear from a narrow sheathing base, acute or with a colourless apex, 1-1.5 mm.; cells rotund, translucent, the papillae bold. Perichaetials not much longer with a very broad base and a short acuminate apex. Capsule small, with a broad pale base shortly or not at all exserted.

The narrow nearly flat dark leaves clustered at the top of the short stem sufficiently distinguishes the species.

Very common at a high altitude.

Andreaea amblyophylla C.M.

Stems short, dichotomously branched, seldom exceeding 1 cm., dark red, but the tips usually red or yellowish-brown.

1913.

Leaves on the lower part and some branches very small oblong, obtuse, concave, erect; upper leaves on the principal branches erecto-patent, oblong-lanceolate, broad at the base but without a defined sheath, concave, rather obtuse, incurved above, papillose externally, nerveless, 0.7 mm.; cells rotund, strongly incrassate, mostly 7-8 μ , the lower ones linear. Perichaetials larger but similar in shape.

Knocklofty, Mt. Wellington, Western Tiers.

Var: *attenuata*. (*A. attenuata* C.M.) Stems short in dense cushions, nearly black. Leaves narrower and more acute, less papillose, lower elongated cells fewer and shorter.

Mt. Wellington, Western Tiers.

Var: *bullata*. Stems very short. Larger leaves yellowish, broadly ovate, shortly acuminate clustered at the ends of the shoots.

Mt. Wellington.

Andreaea montana Mitt.

Decumbent or ascending, on dry rocks forming rather dense mats, where protected elongating 3-4 cm., branches few; red-brown to dark. Leaves erecto-patent to divaricate, broadly oblong with an acuminate apex, stem clasping below but without a distinct sheath, lower margin serrulate, nerveless, surface smooth slightly shining, 1 mm.; cells oblong, very incrassate, irregular but mostly 6 x 9 μ . Perichaetials twice as large and in moist places usually numerous and extending some distance down the shoot. Peduncle very short, capsule just exerted.

Western Tiers, Ben Lomond, Mt. Wellington, Hartz, etc.

Andreaea nitida H.f. et W.

Robust for the genus, forming loose mats in or about running water, black or dark livid green, lower parts denuded. Leaves broadly oblong, obtuse or with a small apiculus, patulous, concave, smooth and polished, 1-1.5 mm.; cells small, irregularly rotund, mostly 6-7 μ , strongly incrassate, rather larger towards the base, those in the middle linear and forming an indistinct simple or forked nerve. Perichaetials rather larger nerveless. Peduncle stout, capsule oblong with a pale base, split into four valves.

Western Tiers, Head of Meander River.

Andreaea subulatissima C.M.

Reddish or black in rather loose cushions, stems usually 2-3 cm.; with few irregular branches. Upper leaves with

a short broad sheathing base and subulate lamina, patent, at the apex curved to form a sickle shaped point, 2 mm. papillose on the external surface; nerve broad, occupying nearly the whole lamina. Perichaetials longer, erect. Capsule shortly exserted.

Common on sub-alpine rocks in wet places.

Fam. 18—SPHAGNACEAE.

Large gregarious mosses forming dense masses in moist situations or submerged in ponds. Perennial, the central stem elongating at the apex, the branches usually in fascicles and always of limited growth, some of the branches of each fascicle are relatively robust, divergent to sub-erect, while others are slender and pendulous, lying close to the stem. Leaves nerveless, thin, of a single cell layer, composed of two forms of cells, namely, large thin-walled tracheids strengthened with annular or spiral fibres and usually pierced with few large pores, contained in a reticulation of linear, chlorophyllous cells. Rarely the development of the tracheids is arrested and all the cells remain similar and chlorophyllous. Antheridia globose, stalked, solitary in the axil of a bract and clustered in lateral rather dense strobili. Archegonia solitary or few at the apex of a branch, concealed by relatively long leaves. Capsule globose, with a minute lid, without annulus or peristome; not developing a seta but bearing only a short foot inserted on the apex of a peduncle which is a leafless prolongation of the parent branch. Protonema a flat expansion of a single cell thickness.

The family contains but one genus, *Sphagnum*, specialised to suit peculiar conditions and not continuous with any other group. In many text-books the spores are stated to be of two forms, large and small, and efforts have been made to prove sexual distinctness of these, but Campbell states that Nawaschin has conclusively shown that the so-called microspores are the spores of a parasitic fungus. The peduncular elongation of the axis is similar to the condition found in *Andreaea*, and the structure of the leaves roughly recalls the tissue of *Leucobryum*, but in each it is a case of similar adaptation and does not imply relationship.

SPHAGNUM (Dill.) Ehrh.

The character is sufficiently indicated in the description of the Family. The species are variable and difficult to diagnose, and are constantly being re-arranged by specialists working at the group. The following is near the latest

1913.

scheme according to Dr. Warnstorf except that varieties and forms are not included:—

Tasmanian forms belong to four sub-sections of the genus, namely, *Cymbifolia*, *Rigida*, *Cuspidata* and *Subsecunda*.

Sub-section *Cymbifolia*. Robust; leaves concave, obtuse, dentate at the back of the apex, tracheids about 40-60 μ in diameter; cortex of the branches, and sometimes the outer series of the stem cortex bearing spiral fibres. Chlorophyllous cells narrow, small, elliptic, generally central.

Stem cortex with fibre *cymbifolium*.

Stem cortex without fibre.

Stem leaves with fibres, branches long, slender

... .. *maximum*.

Stem leaves without fibres, branches short, rigid

... .. *subbicolor*.

Sphagnum cymbifolium Ehrh.

Robust, the divergent branches about 3 cm., tapering to slender tips. Stem cortex broad in 3-4 series, superficial cells with fibres and round pores, sclerotic ring brown, thin, pith broad. Stem leaves ligulate, very obtuse, 2.7 mm. Lower leaves of divergents broadly ovate, obtuse, concave, apex incurved dentate on the dorsal surface, 2.5 mm., border very narrow, tracheids short and broad, those towards the apex and margin with many large oblong pores; cells narrow elliptic, the wall exposed on the upper surface, enclosed on the lower; upper leaves longer. Branch cortex cells very inflated, copiously fibred.

Kingston, Near Lake Sorell, Western Tiers.

Sphagnum maximum Warnst.

Pale, slender, long, the divergent branches spreading, tapering 2-3 cm. Stems cortex broad 3-4 cells, without fibres, sclerotic ring brown, thin, pith broad. Stem leaves broadly ligulate, very obtuse, 1.5 mm., tracheids with spiral fibres. Branch cortex inflated, fibred. Branch leaves very broadly ovate, concave, obtuse, 3 mm., border very narrow, apex cuspidate on the back, tracheids short and broad, pores large oblong, numerous, irregularly disposed, upper leaves narrower and longer; cells very small, narrow elliptic, central. Very close in structure to *S. subbicolor*.

Native of New Zealand. Recorded also as Tasmanian because found as packing in an apple case said to have come from Tasmania. No locality known.

Sphagnum subbicolor Hampe.Syn: *Sphagnum centrale* Jens.

Robust, long in favourable sites, in other places rather short. Divergents short, often all under 1 cm., occasionally longer with tapering ends. Stem cortex broad of four series of cells without fibres; sclerotic ring brown, narrow, pith broad. Stem leaves 2 mm., broadly ligulate, very obtuse, tracheids without fibres. Cortex of branch inflated, fibred. Leaves of divergents very broadly oblong, very obtuse, concave, cuspidate on dorsal surface of apex, 2 mm. border very narrow, tracheids broad, short, pores oblong, large, numerous along both borders; cells narrow elliptic, nearly central, enclosed.

Variable in habit according to local conditions from short and dense to very long and slender, but the branches always relatively short.

Mr. Field, Blue Tier, Western Tiers, Cradle Mt., etc.

Sub-section **Rigida**. Robust; leaves concave, more or less geniculate, apex obtuse, minutely cuspidate; tracheids broad 40-50 μ diameter; branch cortex without fibre, stem cortex of 3-4 series of medium-sized cells. Chlorophyllous cells elliptic, small or medium sized, central.

Usually robust; stem leaves oblong *antarcticum*.
Slender; stem leaves ovate *Weymouthii*.

Sphagnum antarcticum Mitt.

Robust with rather long tapering branches, 3-4 cm. Stem cortex narrow in 3-4 series of small cells without fibres, wood cylinder broad, the sclerotic portion gradually passing into the small celled pith. Stem leaves broadly oblong, obtuse, 1.5 mm. Branch cortex cells long inflated, each with a sessile pore at the upper external surface. Lower leaves of divergents broadly ovate, slightly geniculate, concave, 2.2 mm., apex rather obtuse, minutely cuspidate, border narrow, tracheids broad, pores small, few chiefly at the angles, upper leaves narrower, longer, obtuse; cells elliptic, small, central.

Very common in numerous localities. Variable, the best marked forms being:

Var: *australe* (*S. australe* Mitt). Divergent branches more numerous, less tapering, more erect, tracheids larger.

Var: *macrocephalum*, Warnst. Divergents short, massed in a dense head at the apex of the stem.

Var: *densissimum*, Warnst. Short. Branches short, densely packed on the stem.

1913.

Var: *subsquarroscum*, Warnst. Elongated, slender, depauperated.

Sphagnum Weymouthii Warnst.

Not robust, seldom exceeding 10 cm., the divergent branches tapering, about 3 cm. Stem cortex medium breadth of three series of cells. Stem leaves ovate, obtuse 2.2 mm., border well defined of 4 cells, tracheids copiously fibred, pores few placed at angles. Branch cortex of large inflated short cells apparently without pores. Branch leaves broadly ovate, geniculate, concave, with an obtuse cuspidate apex 3 mm., border narrow, 2-3 cells; tracheids broad; pores few, very small, mostly at the angles; cells elliptic, not very small, central.

Mt. Macmichael, Blue Tier.

Sub-section **Cuspidata**. Slender, the pendant branches not always very distinct from the divergents; leaves narrow ovate to linear, apex truncate cuspidate at least in the lower leaves; stem cortex of 1-2, rarely 3 series of narrow cells, the woody cylinder indistinct; tracheids narrow, mostly 10-25 μ broad. Chlorophyllous cells usually wedge-shaped, broadly exposed on the external surface.

Leaf margin plain *cuspidatum*.
Leaf margin cuspidate.

Branches straight or flaccid.

Tracheids with few or no fibres *trichophyllum*.

Tracheids copiously fibred *Brotherusii*.

Branches falcate.

Lower leaves linear *drepanocladum*.

Lower leaves ovate-lanceolate *Rodwayi*.

Leaves with few or no tracheids, all cells chlorophyllous
... .. *serrulatum*.

Sphagnum cuspidatum Ehrh.

Slender, fascicles distant, branches usually 4-5, the pendants with very narrow leaves but not appressed to the stem. Stem cortex 1-2 series of cells, wood cylinder not distinct. Stem leaves ovate-oblong 1.5 mm., very obtuse, apex truncate, cuspidate, border broad, lower tracheids without fibre, cells as broad as tracheids. Branch leaves oblong-lanceolate, the middle ones 3 mm., basal ones shorter and broader, terminal ones longer, attenuated; margin with a border of 5-7 linear cells, incurved, entire or with very small distant serrulations, apex truncate, cuspidate; tracheids short in lower to very long in upper leaves, 17-25 μ diameter; pores small circular, few to many along both margins 6 μ ; in transverse section cells half as

large as tracheids obtusely wedge shaped, the convex base free on the external surface.

Macquarie Harbour, Mt. Wellington.

Sphagnum trichophyllum Warnst.

Medium sized, generally submerged, densely fascicled, with rather long flaccid branches. Stem cortex 1-2 series of small cells, wood cylinder ill-defined, stem leaves triangular, 1.3 mm., apex sub-acute, obscurely cuspidate, border broad but the linear cells not much altered from the tracheids, cells as broad as the tracheids, lower tracheids narrow without fibres; branch leaves linear elongated to a slender truncate cuspidate or acute apex often 6 mm. long, margin with a border of 3 linear not much narrowed cells, margin cuspidate, tracheids with few or no fibres or pores, mostly under 10μ diameter. In transverse section the cells nearly as broad as the tracheids and nearly round.

Common in water.

Sphagnum Brotherusii Warnst.

Slender, fascicles not very distant 4-5 branched, the divergents not distinct from the pendants, 3-4 cm., slender and tapering. Stem cortex of 2-3 series of small thin walled cells, woody cylinder distinct; stem leaves narrow triangular, 2.3 mm., border broad below, narrow and indistinct above, apex small truncate, cuspidate; tracheids long, lower ones without fibres; cells nearly as wide as the tracheids. Branch cortex a single series of but slightly inflated cells; branch leaves linear with a slender apex about 4 mm., border of 2 series of linear cells, margin cuspidate, apex in the lower leaves truncate cuspidate, in the upper leaves acute; tracheids long, broad, usually $25-30\mu$ diameter, freely fibred, pores very few, rather large at the lateral angles or none, cells one-third as large as tracheids, wedge shaped with obtuse apex and convex base, base freely exposed on external surface.

Very similar in appearance to *S. trichophyllum*.

Table Cape.

Sphagnum drepanocladum Warnst.

Slender, tall, divergent branches 3-4 slender falcate. Stem cortex one celled, woody cylinder very indistinct; stem leaves concave, ovate-triangular from a broad base, 1.5 mm., apex slightly truncate cuspidate, lower tracheids without fibres. Branch leaves linear tapering to a slender apex, the middle ones about 4 mm., margin with a narrow 3 celled border, remotely cuspidate, apex truncate cus-

1913.

pidate or in upper leaves acute; tracheids long about 20μ diameter; closely fibred; pores small, few along the margin or absent. In transverse section the cells are small, broadly wedge-shaped with convex walls and obtuse apex, base not broad, freely exposed on the external surface.

Blue Tier, Alma Tier, Cradoc.

Sphagnum Rodwayi Warnst.

Tall and very slender. Fascicles distant, branches 3-5 slender tapering 2-3 cm., unequal, pendants with narrower leaves, but little distinct. Stem cortex of one or two series of slightly enlarged cells, wood cylinder ill-defined. Stem leaves ovate 1.6 mm., border broad well defined, apex obtuse, cuspidate, but not distinctly truncate. Branch cortex with inflated retort cells, the mouth nearly sessile; branch leaves narrow ovate-lanceolate, 2-3 mm., upper leaves rather longer and much narrower, border well-defined, 3-4 series, margin with few distant small serrations, apex minutely truncate, cuspidate; tracheids not very long, copiously fibred, about 16μ diameter; pores circular about 5μ few along the side of the upper tracheids. Cells in transverse section small wedge shaped with convex walls, the base freely exposed on the external surface.

Strickland.

Sphagnum serrulatum Warnst.

Slender, dark green, branch fascicles rather distant. Stem tissues not clearly marked off from one another, the woody cells slightly thickened and not dark, the cortex of one or two layers not differing except by the walls being thinner; stem leaves ovate-triangular, 1.8 mm.; apex minutely truncate cuspidate, marginal cells not much narrowed, chlorophyllous cells as broad as the tracheids which are without fibres or pores. Branches usually four in each fasciculus, long, slender and flaccid, leaves lanceolate tapering to a slender but obtuse dentate apex, 5-6 mm., margin cuspidate, all the cells chlorophyllose and without fibres or pores, the upper ones rhomboid.

In a ditch near Strahan.

Sub-section **Subsecunda**. Slender to rather robust; leaves ovate, ovate-lanceolate or oblong, apex truncate cuspidate; stem cortex of 1 rarely 2 series of slightly enlarged cells, wood cylinder well developed. Tracheids mostly $17-30\mu$ diameter. Chlorophyllous cells elliptic central rarely partly exposed on the ventral surface.

Pores small, oblong closely appressed to and ringed by the wall. Cell in section elliptic and approaching or exposed on the ventral surface.

Leaves obtusely ovate *submolliculum*.

Leaves acuminate *Moorei*.

Pores not small, free from the wall. Cell elliptic, small, central.

Robust, leaves ovate-lanceolate *cymbifolioides*.

Leaves ovate-acuminate *pseudorufescens*.

Pores minute round, strongly ringed but removed from the wall.

Cell rather large, barrel-shaped central, exposed on both surfaces *molliculum*.

Sphagnum submolliculum Warnst.

Fairly robust, stems often reaching 18 cm., coma usually golden yellow, divergent branches generally two, short, divaricate to patent, 1-1.5 cm., pendants rather closely appressed. Stem cortex of one row of small cells, wood cylinder thick; stem leaves broadly ligulate, very obtuse, 2 mm., border well-defined 4-5 series, upper tracheids copiously fibred, pores ringed, very numerous along both margins, usually one in each space between fibres, ring continuous with cell-wall. Branch leaves ovate, rather obtuse, 2 mm., border well-defined, narrow, 2-3 celled, apex truncate 6-7 cusped; tracheids 16-20 μ diameter, pores small, ringed, very numerous along both margins included in cell-wall; cells in section small, elliptic approaching the ventral surface but not free.

Recherche, Mt. Wellington, Alma Tier.

Sphagnum Moorei Warnst.

Slender, flaccid, fascicles not crowded. Stem cortex 1 rarely 2 series; stem leaves broadly ovate, 1.2 mm., obtuse or obscurely cuspidate at the apex, tracheids copiously fibred, pores small few along both margins ringed by and included in the wall; border 2-3 cells. Branches usually 4 long flaccid tapering, the pendants not very distinct from the divergents; leaves ovate, very acuminate, 1.5 mm., apex abruptly truncate, cuspidate; border three-celled, tracheids 16-20 μ diameter, strongly fibred, pores not numerous, small, placed along both margins and included in the wall; cells in section narrow oblong slightly exposed on ventral surface.

Kelly's Basin, Macquarie Harbour.

1913.

Sphagnum cymbifolioides C.M.Syn: *Sphagnum cymbophyllum* F.v.M.

Robust, tall in favourable situations, the fascicles not crowded. Stem cortex of 1 rarely 2 series; leaves ovate-oblong, 2.5 mm., apex minutely truncate cuspidate, border 4-5 celled, tracheids copiously fibred with few rather large pores. Branches usually five, three divergents slender, tapering, flaccid, not differing greatly from the two pendants; leaves narrow ovate or ovate-lanceolate 3 mm., apex truncate, cuspidate, border 2-3 celled, tracheids copiously fibred with generally a single small oblong pore at each lateral angle; cell small, narrow-elliptic, central.

Port Esperance, Kingston, Strickland, etc.

Sphagnum pseudorufescens Warnst.

Medium sized, usually submerged and tinged with red. Stem cortex 1-2 series of small cells, wood cylinder broad, leaves ovate-oblong 2.2 mm., apex very obtuse, border broad 4-5 celled, tracheids fibred with many large, plain pores. Branches 4-5 in fascicle 1 cm. tapering, not very distinct, usually crowded along the stem, leaves ovate-acuminate, apex truncate-cuspidate, border 3-4 celled, tracheids about 30 μ diameter copiously fibred, pores rather large not ringed, numerous mostly along one margin; cells small, narrow-elliptic, central.

Oyster Cove, Mt. Wellington Summit, Western Tiers, Alma Tiers.

Sphagnum molliculum Mitt.

Rather flaccid, but not slender, 10-12 cm. Branches not regularly fascicled, about 1 cm., and all similar. Stem cortex of one series of slightly inflated cells, wood cylinder thick; stem leaves numerous, ligulate, very obtuse, apex cuspidate, 2.5 mm., border very distinct 4-5 celled, tracheids narrow, copiously fibred, pores very small ringed, numerous along the margins. Branch leaves ovate-oblong, very obtuse, 3 mm., apex broadly convex, 6 cuspidate, border 3 celled, tracheids about 17 μ copiously fibred, pores minute numerous along the margins, ringed but standing out freely from the wall, cells rather large in section barrel-shaped and generally exposed on both surfaces; the leaves of the coma usually much larger, broader and more obtuse.

Western Tiers.

ADDITIONS AND CORRECTIONS.

Leptodontium papillatum (H.f. et W.) is referred in the Pflanzenfamilien to the genus *Triquetrella* C.M..

Streptopogon crispatus (Hpe.) is there referred to *Calyptopogon* Mitt. Also for this Salmon contends that Schwaegraeger's specific name *mauioides* has prior claim.

The moss here described as *Dicranum robustum* H.f. et W. is identified by Dr. Brotherus as *Dicranum* (*Dicranoloma*) *subsetosum* C.M.

The species described as *Orthotrichum Lawrencei* Mitt. has since the publication been found close to the Organ Pipes, Mt. Wellington, and identified by Dr. Brotherus as identical with *O. rupestre*, Schl.

Sclerodontium pallidum (Hook.) Mitt. has also been gathered on the eastern slopes of Mt. Wellington.

Ephemerum cristatum H.f. et W. has been gathered by Weymouth on the ground at Bellerive.

In description of *Lophidiaceae* (*P. and P.*, 1912, p. 10; p. 8 of separate issue), for "Calyptra cucullate" read "Calyptra mytriiform rarely cucullate."

Since publication of the earlier portion of the paper the following new species have been described:—

Campylopus Rodwayi Broth.

Depressed forming loose mats, pale yellowish-green, the ends of the branches readily separating as buds with a few long twisted leaves. Leaves narrow linear, tapering from the base to the filiform not hyaline apex, 9 mm., margin entire except at the apex which is cuspidate; nerve broad and flat occupying the whole of the upper portion, the wing elsewhere very narrow; cells of wing irregularly oblong, smooth, incrassate; alars numerous, brown, inflated, forming prominent auricles. Rest not seen.

Summit Mt. Wellington, Ironstone Mt.

Zygodon Rodwayi Broth.

Erect in dense mats, stems slender, about 1 cm. Leaves erecto-patent, ovate-acuminate, rather acute, 0.3 mm.; nerve broad canaliculate, lost below the apex; cells irregularly rotund, smooth. Seta slender about 1 cm.; capsule erect, narrow oblong, 1.1 mm., mouth little constricted, furrowed when dry; lid with a rather long oblique notum; peristome double, exostome of 8 short broad geminate teeth, endostome of 8 incurved cilia. Leaves much

1913.

smaller than in *Z. Menziesii* and not crisped when dry as in that species. Leaves smaller than in *Z. minutus* and nerve much broader and lost below the apex.

Forth River near Sheffield.

Bartramia erecta (Hampe)

Syn: *Glyphocarpa erecta* Hpe., *Bartramidula Hampeana* Mitt.

Stems short, erect, clustered in tufts, usually under 1 cm. Leaves spreading, concave, narrow linear, tapering from a narrow hyaline, sheathing base, 2.5 mm., apex acute; margin rather coarsely serrate; nerve broad continuous, surface obtusely papillate; cells rectangular, those of the base much larger. Seta 1 cm., capsule inclined, nearly globose, sulcate, 1.2 mm., mouth broad, peristome none.

With the spreading leaves of *B. papillata* it has the narrow leaf base of *B. strictifolia*, and differs from either in the absence of a peristome.

Waterworks, Hobart, Bismarck Road.

INDEX OF GENERA.

Synonyms in *italics*.

- | | |
|----------------------------|------------------------------|
| Acanthocladium, 205, 219 | Bruchia, 87, 88 |
| Acaulon, 12, 13 | Bryum, 178, 181-191 |
| Acrocladium, 205, 220 | Buxbaumia, 248 |
| Amphidium, 105, 122 | <i>Calypotropogon</i> , 260 |
| Andreaea, 249-252 | Camptochaete, 223, 228-229 |
| Anisothecium, 87, 93-94 | Campylium, 205, 209-210 |
| Barbula, 12, 22-24 | Campylopodium, 87, 93 |
| <i>Barbula</i> , 20 | Campylopus, 87, 96-99, 260 |
| Bartramia, 192-193, 260 | Catharinea, 244, 245 |
| Bartramidula, 192, 193-194 | Catharomnion, 236, 238-239 |
| <i>Bartramidula</i> , 261 | Catagonium, 205, 219 |
| Elindia, 87, 99-100 | Ceratodon, 87, 89-90 |
| Brachymenium, 178, 181 | <i>Cladomnion</i> , 234 |
| Braunia, 235 | <i>Condonblepharum</i> , 121 |
| Breutelia, 192, 195-197 | Ccnostomum, 192, 198 |

Pp. 3-24 (Part I.) and 87-138 (Part II.) are in *P. and P.* 1912: pp. 177-261 (Part III.) in this volume.

- Cryphaea, 224, 231-232
Cryphaea, 231
 Cyathophorum, 237, 239
 Cynodontium, 87, 92-93
 Cyrtopus, 223, 225
 Daltonia, 240-241
 Dawsonia, 245, 247-248
 Dendrocryphaea, 224, 231
Desmatodon, 15
 Dicranum, 87, 100-103
Dicranum, 94, 95, 100
Didymodon, 21
 Distichium, 87, 94-95
 Distichophyllum, 240, 241-243
 Ditrichum, 87, 90-92
 Drepanocladus, 205, 209
 Echinodium, 223, 225
 Encalypta, 12, 24
 Ephemerum, 12, 13
 Eriopus, 240, 241
 Eucladium, 12, 20
 Fissidens, 131-138
 Funaria, 200, 201-204
 Gigaspermum, 200, 201
Glyphocarpa, 261
 Glypomitrium, 104, 110-111
 Glyptothecium, 224, 234
 Goniobryum, 124, 129-130
 Grimmia, 104, 105-107
Gymnostomum, 18
 Hedwigia, 224, 236
 Hedwigidium, 224, 235-236
 Holomitrium, 12, 21-22
 Homalia, 224, 233
Hookeria, 240
 Hymenodon, 124, 126-127
 Hypnodendron, 205, 210-211
 Hypnum, 205-209
Hypnum, 213, 214, 215, 216, 219, 225
 Hypopterygium, 237, 238
 Isopterygium, 205, 217-218
Isothecium, 211, 212, 225, 228, 229
 Lembophyllum, 223, 226-227
Leptangium, 201
 Leptobryum, 177, 180
 Leptodontium, 12, 21
 Leptostomum, 124, 125
 Leptotheca, 124, 126
 Lepyrodon, 224, 233-234
 Leucobryum, 123
Leucodon, 234
Leucoloma, 95
 Lophidium, 236, 237-238
 Macromitrium, 105, 116-119
Meteorium, 227, 230
 Mielichhoferia, 177, 178
 Mittenia, 124, 130
 Mniobryum, 177, 179
 Mriodendron, 205, 211-212
Mniopsis, 130
 Neckera, 224, 232-233
Neckera, 226, 233
 Oithodontium, 177, 178-179
 Oithotrichum, 104, 111-113
 Papillaria, 223, 229-231
 Phascum, 12, 13-14
 Philonotis, 192, 194-195
 Physcomitrium, 200, 201
Pilotrichella, 227
 Plagiothecium, 205, 218-219
 Pleuridium, 87, 89
 Pleurophascum, 224, 234-235
 Pogonatum, 244, 246
 Pohlia, 177, 179-180
 Polytrichadelphus, 244, 246-247
 Polytrichum, 245, 247
Polytrichum, 245, 246
Porotrichum, 228, 229

1913.

- Pottia, 12, 14
 Psilopilum, 244, 245-246
 Pseudoleskea, 205, 222
 Pterygophyllum, 240, 243-244
Ptychomitrium, 111
 Ptychomnion, 205, 210
 Rhabdodontium, 224, 232
 Rhabdostegium, 205, 212-215
 Rhacocarpus, 224, 235
 Rhacomitrium, 104, 107-110
 Rhacopilum, 236, 237
 Rhizogonium, 124, 127-129
Rhizogonium, 130
 Sauloma, 240
 Sclerodontium, 87, 95
 Sphagnum, 252-259
Splachnum, 199, 200
 Streptopogon, 12, 17
 Stereodon, 205, 215-217
Stereodon, 218
Swartzia, 94
Symblepharis, 22
 Tayloria, 198-199
 Tetraplodon, 198, 200
 Thamnum, 223, 225-226
 Thuidium, 205, 220-222
 Tortella, 12, 20-21
 Tortula, 12, 14-16
Tortula, 17
 Trachyloma, 224, 233
Trachyloma, 211
Trematodon, 93
Trichostomum, 91
 Triquetrella, 260
 Tridontium, 87, 95
 Ulota, 104, 113-116
 Weissia, 12, 18-20
 Weymouthia, 223, 227-228
 Zygodon, 105, 119-122, 260
Zygodon, 122

Pp. 3-24 (Part I.) and 87-138 (Part II.) are in *P. and P.* 1912; pp. 177-261 (Part III.) in this volume.