

straight veinlet to the sinus; but in the lobes of the upper pinnae the lower pair of veins are curved and barely meeting at the sinus. Sori small, reddish, nearer costa than margin.

*Hab.* Sides of streams, forests near Matamau, County of Waipawa; 1882-83: *W.C.*

*Obs.* I. This fern is nearly allied to *P. (G.) pennigerum*, Forst., with which, at first sight, it is likely to be confounded and taken for a small plant of that species; but a close examination reveals its difference in several characters—viz., the very much smaller size, narrower and slenderer in all its parts, its excessive hairiness, with peculiar large scales scattered on its frond, and the lobes ciliated; the pinnae distant, very narrow and largely petiolate, with only the lowest veinlet of the lobes uniting, and the basal lobes large and pinnatifid with bipinnate veins. By some botanists, however, it may be considered as merely a variety of *P. pennigerum*, like two others (varieties) I have described.\*

II. This fern is rather scarce, I having met with it in profusion in only one spot, where, however, were several low arborescent plants of it growing together, forming a little thicket or tangled brake, and certainly looking very pretty and neat.

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ART. XXIX.—On new Indigenous Cryptogams, of the Orders Lycopodiaceæ, Musci, and Hepaticæ.

By W. COLENSO, F.R.S., F.L.S., Land., etc.

[Read before the Hawke's Bay Philosophical Institute, 17th October, 1887.]

ORDER II.—LYCOPODIACEÆ.

Genus 2. *Lycopodium*, Linn.

§ III. Leaves imbricated all round the stem. Spikes terete, peduncled.

1. *L. scopulosum*, sp. nov.

Plant small, erect,  $2\frac{1}{2}$ –3 inches high, dichotomously branched, branches spreading. Main stem wiry, slender, rigid,  $\frac{3}{4}$  inch long, bare; forked from underground (and without roots to specimens), the two lower branches also bare below for about  $\frac{1}{4}$  inch each, twice forked above, each of the forkings again divided into 4 equal branchlets, sub 1 inch long, cylindrical and densely leafy throughout. Leaves somewhat sexfariously disposed,

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\* Vars. *hamiltonii*, and *giganteum*, "Trans. N.Z. Inst.," vol. xiv., p. 338, 339.

closely adpressed, erect, imbricate, linear-acuminate, sub-cylindrical compressed, flattish on one side, convex on the other,  $1\frac{1}{2}$  lines long, pale yellow-green, shining; tips very long, acute and reddish. Peduncles terminal, single, erect,  $\frac{1}{2}$  inch long, slender, sub-cylindrical, striate, with a few yellow cauline bracts as long as leaves, narrow, ovate-acuminate, flexuous and squarrose, distant and scattered below, sub-verticillate (about 4 together) above. Spike 1 inch long, cylindrical, scales sub-peltate, sex-fariously arranged, very close and imbricate, ovate-acuminate, yellow with a blackish central stripe, adpressed below; veins closely anastomosing, apparent when held up between the eye and light; margins finely erose wavy and recurved; tips spreading squarrosely. Capsule wider than scale, orbicular-reniform, pale yellow.

*Hab.* Lava beds, base of Mount Ngaruahoe, County of East Taupo; "altitude 3,000 feet;" 1887: *Mr. H. Hill*.

*Obs.* I. This little plant is somewhat allied to *L. clavatum* var. *magellanicum* (of the "Handbook N.Z. Flora"), but differs from that species in its stem not being creeping below, and in not being fastigiately branched; in its small slender few-leaved (almost bare) peduncles, and in its scales being of a different shape, narrower and entire at their bases, etc.

II. *L. clavatum* var. *magellanicum*, is also said by Hooker (*loc. cit.*) to be identical with *L. pichinchense* (Hook. "Ic. Plant," tab. 85), and, in "Flora of New Zealand," it is further said to be identical with *L. heterophyllum*, Hook., ("Ic. Fil." tab. 118). I have closely examined those drawings, and also that of *L. clavatum*, Hook. ("Brit. Ferns," tab. 49, and Sowerby's "English Botany," tab. 1451.) and find this plant to have no close affinity with them; in fact, to differ considerably in several characters. I have received three specimens of this plant, that are pretty nearly all alike in size and ramification, all dichotomously spreading; two of them being good fruiting specimens—one, 8-branched above and bearing 4 single spikes, and one, 6-branched with 2 single spikes.

2. *L. curvifolium*, sp. nov.

Plant, rhizome or main stem "creeping on the surface of the ground." Stems erect, 10–12 inches high, slender, wiry, hard, whitish, distantly leafy, leaves somewhat sub-verticillately disposed; sparingly branched. Branches sub-erect, alternate, 3–5 inches long, sub-flabelliform, much branched above, very leafy throughout; branchlets dichotomous, slender, 2–3 inches long, sub-erect. Leaves loosely imbricating all round, flat, very narrow, linear-acuminate, 2 lines long, (larger ones on main stems 3–3 $\frac{1}{2}$  lines long, very distant, and sub-appressed.) decurrent, spreading, patent, curved; tips ascending, acute. Spikes

terminal on main branches, paniced; panicles sub-fastigiate, 2-4-branched, bearing 3-8 spikes on long slender pedicels, that are sparingly leafy as on main stems, but leaves smaller; spikes usually 2 together, or 3, or only 1, sometimes bifid or forked,  $1\frac{1}{4}$ - $1\frac{3}{4}$  inches long, very narrow, about 1 line wide, sub-cylindrical; scales quinquefariously disposed, imbricate, peltate, narrow-ovate-acuminate, brown on centre outside; margins waved, minutely denticulate; tips acute and obtuse, spreading. Capsule large, pale greenish-yellow, broadly and transversely oblong or sub-quadrilateral; valves, margins wavy and slightly erose. Spores white, semi-elliptic, roughish.

*Hab.* High lands, "altitude 2,000 feet," north of Gisborne, County of Cook; 1887: *Mr. W. K. Chambers.*

*Obs.* This species has a very pleasing miniature tree-like appearance, somewhat resembling some specimens of another New Zealand *Lycopodium*, *L. densum*, Labill., but more neat and finely cut, to which species it is also pretty closely allied. From that species, however, its larger more distant and less imbricated curved leaves, its longer and narrower spikes, which are also paniced, and mostly 2 or even 3 together on long slender pedicels, and its peculiarly-shaped capsule abundantly distinguish it.

§ IV. Leaves distichous. Spikes terminal, terete.

3. *L. distans*, sp. nov.

Plant "creeping, spreading on surface of the ground;" main stems "long, rooting at nodes." Secondary stems erect, straight, "4-6 inches apart," 6-8 inches high, sub-cylindrical, slender, woody, irregularly and deeply channelled on the upper surface, leafy, much branched. Branches flat, spreading, sub-flabellate, tri-quadrifid; branchlets dichotomous, 2-3 inches long,  $2\frac{1}{2}$ -3 lines wide; tips forked, divergent. Leaves distant throughout, (those on secondary stems very distant, 3-4 lines apart, sub 2 lines long, obtuse,) regularly disposed, alternate, coriaceous, glabrous, wrinkled, light-green on both sides, of two kinds: (1) the larger, patent, triangular, curved, falcate, tips acute, incurved, largely decurrent; (2) the smaller on under-surface only, sub-tristichous, the lateral ones arising from the decurrent bases of the larger leaves, the central from the middle of stems, linear-acuminate, sub 3 lines long, their bases appressed; tips acute, wavy, scarious, spreading, appearing above in the interspaces between the larger leaves. Peduncles very long, 2-4 inches, slender, erect, simple, forked, dichotomous and trichotomous, leafy; leaves or bracts long narrow, acuminate, erect, scattered, semi-appressed; tips spreading, scarious, membranaceous, jagged, acute. Pedicels 1-3, similar to peduncles, 1-2 inches long, spikes narrow, compact,

1-1 $\frac{3}{4}$  inches long, 1-1 $\frac{1}{2}$  lines wide, tips obtuse; scales broadly deltoid acuminate, their centres green and somewhat turgid, margins yellow, membranaceous, denticulate and wavy; tips long, acute, patent, decurved, their edges finely serrate-cut. Capsules yellow, broader than scales, margins sub-sinuate, entire, the inner valve larger. Spores white, orbicular and sub-orbicular-cordate, much echinate, their trilateral suture strongly marked.

*Hab.* High lands, County of Cook, with preceding; 1887: Mr. W. K. Chambers.

*Obs.* I. This is a fine stout leafy species; it has near affinity with *L. scariosum*, Forst., (also a New Zealand *Lycopodium*.) but differs from that species in several particulars: as in the tips of its branchlets being forked and divergent; in its more distant leaves that are also unicoloured; in the smaller ones (or stipules) being subtristichous, longer, and much more acute; in its very long peduncles; in its narrow and long spikes, with differently shaped acuminate scales, and broader capsules extending laterally beyond them; and in its globular echinated spores.

II. This plant, from its somewhat resembling at first sight *L. scariosum*, has caused me some considerable exercise in a series of long, close, and repeated examinations. Fortunately, I have received specimens of it in various stages and sizes, with, also, full descriptions of *L. scariosum* by several celebrated botanists, and drawings with dissections by Sir W. J. Hooker of *L. scariosum*, Forst., var. *decurrens*, Br., and of *L. jussieui*, Desv., which two plants Sir J. D. Hooker says, in his description of *L. scariosum*, are identical with it ("Hand-book, Flora N.Z."). There is, however, very little, if any, close affinity between those two drawings and this plant here described (or even between those two drawings themselves). Bentham ("Flora Australiensis") describes the spikes of *L. scariosum* as being "sessile, about  $\frac{1}{2}$  inch long; bracts (or scales) in four rows," etc., agreeing with the figure of *L. scariosum* var. *decurrens*, Br. (*supra*), which species and name he also refers to as a synonym; but he does not retain *L. jussieui*, and, as I think, rightly, for they are apparently very distinct. I again have much pleasure in recording the able and ready assistance kindly rendered by Dr. W. I. Spencer, F.L.S., in examining and determining its spores.

#### Genus 4. *Psilotum*, Swartz.

##### 1. *P. heterocarpum*, sp. nov.

Plant terrestrial; rhizome hypogæous, shortly creeping, 3-4 inches long, slender, cylindrical, slightly branched with short thickish rootlets, hairy; hairs crowded, short, patent, clavate-

tipped, red. Vernation erect, 7–9 inches high, sub-cæspitose, 6–10 stems rising nearly together, sometimes 3–4 stems uniserial and distant from a single rhizome; main stem stoutish, 1 line diameter, somewhat rigid, sub-cylindrical, bare of branches but much branched at top, leafless, with small scattered linear obtuse scales about 1 line long, smaller and more numerous on branches. Frond 4–5 inches long, spreading, flabellate, dark-green minutely speckled with whitish dots, glabrous, glossy; branches largely dichotomous, sub-angular (as also branchlets); branchlets numerous, very slender, less than  $\frac{1}{2}$  line wide, long, straight, spreading, flexible; tips truncate, retuse and slightly emarginate. Capsules rather numerous, alternate, lateral and peduncled, mostly on the middle branches (not below, rarely at the tops), very small,  $\frac{1}{20}$ th inch diameter, sub-globose and slightly tri-lobed depressed, sometimes plain, also elliptic longer than broad, 1–2–3- and 4-celled, green at first (same colour as frond) and very glossy, orange-yellow when ripe, minutely dotted (*sub lente*), sometimes with 2 very small ovate obtuse lobes, or a minute bract, closely adpressed at base; peduncles short, about 1 line long, stout. Spores white, narrow oval.

*Hab.* Wairakei, Taupo, near the River Waikato, in ground heated by hot springs, among thick growing shrubs of *Leptospermum*, etc.; 1887: Mr. C. J. Norton.

#### ORDER IV.—MUSCI.

##### Genus 37. *Mnium*, Bruch and Schimp.

###### 1. *M. xanthocarpum*, sp. nov.

Plant creeping, straggling; main branches 3–4 inches long, tips proliferous, hairy; branches sub-erect,  $\frac{1}{2}$ –1 inch high, bare below and hairy. Leaves few, sub-rosulate at tips of branches, oblong, obtuse (sometimes slightly retuse,) apiculate,  $2\frac{1}{2}$ –3 lines long, (recurved and crisp when dry,) narrowly margined, margin entire but slightly uneven, sometimes minutely and sparsely denticulate towards apex, upper basal half free from stem of branch; nerve stout percurrent; dark-green, (pale in age,) sub-opaque; cells sub-orbicular-oblong with double walls, smaller and crowded at apex. Fruit-stalk erect, 15 lines long, stout, firm, yellow-green, base red, 1–4 growing together. Capsule oblong-cylindrical,  $1\frac{1}{2}$  lines long, sub-rugulose, horizontal and cernuous, yellow with dark orange rim at mouth. Operculum broadly conical, obtuse, much shorter than capsule,  $\frac{1}{5}$ th inch long, minutely papillose, orange. Teeth, external, brown, with 4 longitudinal lines, the transverse bars in pairs; internal, pale brown with distant bars and 4–6 large areoles in each tooth, very acuminate, filiform and knobbed, tips flexuose; the intervening ciliæ single and forked above with long filiform knobbed tips. Calyptra not seen.

*Hab.* Wet shaded forests near Norsewood, County of Waipawa; 1886: *W.C.*

*Obs.* This species is closely allied to *M. novæ-zealandiæ*,\* Col., and also to *M. rostratum*, Schw., and *M. rhynchophorum*, Hook. From the former of those three species it differs in its smaller and dark-green leaves with narrower margins and small crowded cells at their tips; in its bearing 3-4 fruit-stalks, and its smaller and narrower capsule, which is also roughish, and yellow with an orange-coloured mouth; in its internal teeth being largely perforated, with long flexuous tips and their intervening ciliæ only single and forked at top; and in its operculum being much shorter than the capsule, of a different shape, orange-coloured and papillose—all which differences also apply more or less to the two other species named above.

#### Genus 46. *Polytrichum*, Linn.

§ V. *PHALACROMA*, Hook. f. and Wilson.

(Stem tall, fastigiously branched, dendroid.)

##### 1. *P. tongariroense*, sp. nov.

Plant erect, 8-10 inches high; stem long, simple below, much branched at top. Root (specimens) sub-horizontal, 1½ inches long, 2 lines thick, curved, densely covered with white wool. Stem slender, straight, and flexuous, 5-6 inches high, brown, glossy, triquetrous and regularly scarred below, clothed above with sheathing imbricated closely adpressed scale-like leaves, their vaginant bases large, oblong-quadrate, 1½ lines long, 1 line broad, very glossy, nerve stout, prominent on outside (not broad), excurrent and forming the aristate leaf, 1 line long, increasing in size upwards on stem to 2 lines long, curved, acute, very slightly serrulate (*sub lente*); the top or branched part 3-4 inches long, containing 15-17 alternate and distant branches; branches simple, 2-2½ inches long, sometimes the lower ones are forked near their bases, loosely spreading, leafy throughout. Leaves a pleasing green, very numerous, rather loosely arranged, wavy and curled (dry), the free part very narrow linear, ½ inch long, ⅓<sup>rd</sup> inch broad, tip acute, canaliculate on upper surface, the centre opaque with a stout narrow prominent nerve; margined; margins translucent, cells minute, orbicular, distinct; slightly serrulate, serratures increasing towards apex (almost entire about base), teeth sharp; the vaginant base large, shining, brown, 1 line wide, abruptly dilated quadrate, with a wavy crease at each side at top owing to the sudden expansion; margins of vaginant portion straight,

\* "Trans. N.Z. Inst.," vol. xviii., p. 225.

entire; cells oblong and distinct at the upper angles, but longitudinally linear and compact in the main part. Fruit unknown.

*Hab.* Ash-beds, base of Mount Ruapehu, Tongariro Range, "altitude 5,400 feet," County of East Taupo; 1887: *Mr. H. Hill.*

*Obs. I.* This fine species is near the large known New Zealand species, *P. dendroides*, Comm., but differs much from that plant in several characters—viz., in the number, size, and disposition of its branches, in its leaves being of a fresh light-green colour, longer, narrower and margined, with fewer, shorter and sharper teeth, and especially in the shape and larger size of their lower vaginant portion; in the stem-leaves being continuous imbricate and closely adpressed, with also large quadrate bases; and in its thick white woolly roots.

*II.* I have received several good specimens of this plant, and they are all very similar; unfortunately none bear fruit. This, however, is a common feature with those large dendroid mosses, and is often found to be the case with *P. dendroides*, *P. squamosa*, *Dawsonia superba*, etc. I have occasionally fallen in with large patches of these mosses in the forests without detecting a single fruiting specimen. Indeed, both in Schwae-grichen's drawing with dissections of *P. dendroides*, and in Hooker's drawing of *P. squamosa* (discovered by him in Fuegia), there are no fruits given.

### Genus 61. *Isothecium*, Bridel.

#### § B. HYPNODENDRON.

(Stem naked below, fastigately branched above.)

##### a. Capsule terete.

##### 1. *I. heterophyllum*, sp. nov.

Stems stoutish, erect, 3-4 inches high, woody, dark-coloured (blackish-red), shining, scarred below, leafy above, base thickened with many fine dark-brown capillary rootlets; numerous and closely branched at top of stem, sub-umbellate, mostly sub-orbicular in outline, 2-2½ inches diameter; branches 1½ inches long, 3-pinnate, spreading, sometimes the lowermost pair of branches are very long and depending. Leaves pale-green, shining, sub-concave, of various shapes and sizes; cells narrow, linear, crowded, broader shorter and clearer at bases; margins not bordered: (1) leaves on upper stem large, broadly-ovate-acuminate, 1½ lines long, distant, transparent, spreading, dimidiate, their margins very slightly and distantly denticulate-serrulate; outer basal margin much rounded, sub-amplexicaul; tips piliferous, flexuous: (2) leaves on branches

sexfariously disposed, very close, crowded, imbricate, spreading, of three forms and sizes, (a.) broad and similar to those on main stem but shorter, nerve red-brown; (β.) ovate; and (γ.) narrow-oblong, strongly nerved, nerve not percurrent, vanishing below apex, tip mucronate, upper margins sharply serrate, nerve at back near top serrate sub 6 teeth; the ultimate branchlets red-brown, glossy, with the leaves quadrifariously and more loosely disposed; perichæatial leaves very long, subulate,  $\frac{1}{2}$  line wide at bases, erect, flexuous; tips piliferous, very slightly and distantly serrulate (*sub lente*), with 5-7 dark longitudinal plaits, red at bases. Fruit-stalks many, sub 20 on a stem on the upper side of main branches, 1-1 $\frac{1}{4}$  inches long, red and smooth (as also capsule), very flexuous, drooping, largely vaginant; vagina dark-brown. Capsule cernuous, not grooved, obovate-oblong, cylindric, turgid, unequal, lower edge straight, the upper gibbous; outer teeth incurved when dry, subulate, broad at base, brown, tips pale, closely barred with no medial line, margined with a dark line and a narrow hyaline slightly erose outer margin; inner teeth pale-yellow distantly barred with brown, their tips brown and filiform, with two long capillary knotty ciliæ between each tooth. Operculum half as long as capsule, base hemispherical, acuminate with a long obtuse beak. Calyptra dimidiate, 2 lines long, narrow subulate, obtuse, red, glabrous, glossy, cylindrical and entire for more than half of its length.

*Hab.* Growing on the ground in large patches among *Hymenophyllum*, in shady forests near Danneverke, County of Waipawa; 1887: *W.C.*

*Obs.* A fine handsome moss; its affinities are with two or three other fine dendroid New Zealand species of this genus—viz., *I. menziesii*, Hook. f. and Wilson; and *I. kerrii*, Mitten; but differing from the former in its differently-shaped and much shorter capsule, in its perichæatial leaves not being serrate, and in its larger piliferous stem-leaves; and from the latter in its nerves not being excurrent; while from *I. marginatum*, Hook. f. and Wilson, it also differs in its capsule not being grooved and its leaves not margined.

2. *I. obscurum*, sp. nov.

Plant densely matted; rhizome creeping, branched. Stems dendroid, erect, 1 $\frac{1}{2}$ -2 inches high, sub-rigid, stoutish, cylindrical, bare and ringed below, with a few distant foliaceous scales scattered above; 3-pinnate, much and irregularly branched; branches at their bases like the main stem; branchlets usually short, stiff. Leaves dull green (becoming brownish and discoloured in age), sub-quadrifariously disposed, erect, very close, compact, imbricate, spreading, all similar, sub-linear-ovate, entire, acute, nerveless; cells very minute, narrow-linear, long,



crowded, shorter and clearer at base; perichætal leaves long, acuminate, recurved, extending along fruit-stalk. Fruit-stalk short, 3 lines long, reddish, curved at tip. Capsule oblong, smooth, sub-erect, reddish; operculum sub-conical, with a short obtuse beak. Calyptra (young) smooth subulate long, narrow.

*Hab.* On ground, woods south of Danneverke, County of Waipawa; 1887: *W.C.*

β. Capsule grooved.

3. *I. tomentosum*, sp. nov.

Plant dendroid; stems stout, erect, flexuous, 2–3 inches high, bearing many large scattered leaves, densely clothed with fine dark-brown branched tomentum-like rootlets, the top much and closely branched forming a thick globose mass  $1\frac{1}{2}$  inches wide; branches pinnate. Leaves numerous, rather close, sub-decussate, their bases imbricate, triangular-ovate, base subcordate, clasping, very acuminate, tips acute, spreading; margins of upper half coarsely serrated, of the lower half slightly uneven and narrowly margined, pale-yellowish-green (tinged with red in age), glabrous, glossy, nerve stout, vanishing below tip; cells longitudinal, exceedingly narrow, broader and oblong at the wings of base; leaves of stem very large, 2 lines long, 1 line broad at base, triangular, very acuminate; tips acute, long, almost acicular; nerve strong, sub-flexuose. Fruit-stalks numerous, 1–20, erect, 1 inch high, stoutish, flexuous, twisted above, dark-red, shining. Capsule sub-obovate,  $1\frac{1}{2}$  lines long, broadly and deeply grooved, dimidiate, horizontal and sub-cernuous, the lower margin straight, the upper arched, strumose, dark-red, glossy; operculum large, nearly as long as capsule and same colour, hemispherical, beak very long, depressed, acute.

*Hab.* High lands, interior, north of Napier; 1887: *Mr. A. Hamilton.*

*Obs.* This species has affinity with *I. comosum*, Hook. f. and Wilson, but it is very distinct. Unfortunately I have only had two specimens to examine (the discoverer having mislaid his specimens), and both were old, with the greater number of their capsules broken (or gnawed) at their tips.

Genus 67. *Hypopterygium*, Bridel.

I. HYPOPTERYGIUM.

(Stem 2–3-pinnately branched above, there orbicular or deltoid in outline; branches radiating. Fruit-stalk rather long.

β. Leaves with bristles intermixed.

1. *H. elegantulum*, sp. nov.

Rhizome long, creeping, slender, distantly branched. Plant  $1\frac{1}{2}$ –2 inches high, erect, bipinnate, soft, delicate, neat, bright

emerald-green. Stem slender, usually  $\frac{1}{2}$  inch, sometimes 1 inch long, simple (rarely forked, or with 3 main-stem-like branches), scaly from base; scales sub-foliaceous, distant, scattered, sub-ovate-acuminate, patent. Frond orbicular,  $1\frac{1}{4}$ – $1\frac{1}{2}$  inches diameter; branches few, alternate, open, radiating, very narrow. Leaves (lateral) sub-distichous, distinct, free, alternate, dimidiate, orbicular-ovate, serrate, tip very acuminate, the bases large and overlapping; nerve extending  $\frac{3}{4}$ ths of leaf; cells minute, sub-orbicular, guttulate, crowded: (dorsal) deltoid-orbicular, ciliate, nerveless, tip acuminate very long; cells larger and clearer; a single long flexuose spreading seta alternate from each dorsal leaf: (perichæatial) outer leaves sub-orbicular, concave; the inner ovate-acuminate, margins entire; tips very long, piliferous, flexuous; cells long linear, very close. Fruit-stalk  $3\frac{1}{2}$  lines long, twisted, thickened at top, red-brown, vaginant, 2–12 together on a stem. Capsule cylindrical, oblong, constricted below mouth, tubercled at base, horizontal and inclined, red-brown; cells of capsule broadly oval with double walls and minute cellules in them. Teeth, outer, brown, subulate, very acuminate, tips sub-piliferous, with closely barred double lateral lines and a short faint median line, margins dark; inner teeth, short, pale, blunt, loosely barred. Calyptra (immature) conical-acuminate, slightly fissured at base, not dimidiate; base white, pale-green above. Operculum not seen.

*Hab.* On the ground, shady ravines, forest south of Danneverke, County of Waipawa; 1887: *W.C.* Rather scarce.

*Obs.* A species having pretty close affinity with *H. tamariscinum* and *H. rotulatum*, Hedw. Its habit of growth more open and scattered than obtains in the other New Zealand species of this genus. A truly elegant moss.

#### ORDER V.—HEPATICÆ.

##### Genus 2. *Jungermannia*, Linn.

###### 1. *J. geminiflora*, sp. nov.

Plant tufted, spreading, erect, 1 inch high, branched; stems very leafy and rooting on under-surface,  $\frac{1}{10}$ th inch wide. Leaves light-green with a purplish tinge, sub-deltoid-ovate,  $\frac{1}{5}$ th inch long, very broad, acute, apiculate, tips incurved, opposite, imbricate, sub-vertical, spreading, narrowly margined with a dark line, edges unequal entire and slightly undulate, mostly more so on one side, decurrent on upper surface; cells minute, orbicular, distinct, guttulate, arranged regularly in longitudinal rows, smaller at margins, larger oval and punctured in centre; involucreal leaves large, spreading, waved, deeply laciniate-ciliate. Stipules 0. Perianth terminal, often twin (1 on short lateral branch at tip), large,  $1\frac{1}{2}$  lines long, oblong-ovate, inflated, sub-

8-plicate, mouth deeply lacinate; laciniae ciliate at tips; cilia waved, jointed; cells as in leaves. Capsule (immature, at bottom of perianth) stalked, globular, longer than broad, apiculate, shining, green. Sporules numerous, triangular; elaters small, stout, obtuse.

*Hab.* In patches among mosses, woods South of Danneverke, County of Waipawa; 1887: *W.C.*

*Obs.* A species allied to *J. monodon*, Hook. fil. and Tayl., but differing in several particulars.

### Genus 3. *Plagiochila*, Nees and Montagne.

#### § I. Stems simple or sparingly branched.

##### 1. *P. recta*, sp. nov.

Plant small, gregarious; rhizome creeping. Stems erect, simple, sometimes forked or slightly branched,  $\frac{3}{4}$ –1 inch high, 2 lines wide, tips decurved. Leaves alternate, sub-imbricate, obliquely oblong-cordate, entire, falcate, very thin and tender, of a lively light-green, apex truncate, recurved, with 2 minute divergent acute teeth, one at each outer angle; ventral margin much arched, the base free, large and round, produced and meeting the opposite leaf on ventral side, and so appearing as a uniform longitudinal line or ridge; dorsal margin straight, decurrent, with a crease in each leaf where it joins the stem. Cells crowded, orbicular with double walls and minute cellules regularly disposed in their centres, clear. Involucral leaves broader and larger with margins minutely denticulate. Perianth large (for plant), terminal, sessile, pale green, sub-oblong-quadrate, sides straight (*poculiform*), thin, much compressed above, inflated below, mouth truncate, entire, margin slightly sinuate and irregularly denticulate.

*Hab.* In low wet woods near Norsewood, County of Waipawa; forming small thick patches on branches of trees; 1886: *W.C.*

*Obs.* This is a peculiar looking little species when in flower, owing to its large pale and straight-sided terminal perianths; apparently it is rather scarce. In size and general appearance it is somewhat like *P. serrata*, Lind., and *P. approximata*, Lind.; while the form of its leaves closely resembles those of *P. radiculosa*, Mitten, (a much larger indigenous species, differing widely in habit, shape of perianth, and areolation;) its leaves are also largely and regularly produced at their ventral bases, somewhat like those of *P. hypnoides*, Lind.

##### 2. *P. cœspitosa*, sp. nov.

Plant densely gregarious; rhizome creeping, wiry, dry, much branched and implexed. Stems brownish, erect, simple, rarely branched, 1–1½ inches high, 3½ lines wide, leafy to base, tips

recurved. Leaves alternate, close, sub-imbricate, obliquely cordate-orbicular, 2 lines long, very obtuse, narrowly margined, semi-amplexicaul, spreading, decurved, dusky pale-green rather obscure (when dry, margins revolute); ventral margin and apex denticulate, teeth irregular and distant, acute and obtuse, base free, produced, overlapping stem; dorsal margin entire, nearly straight, slightly decurrent, thickened and contracted at junction with stem, small and sub-orbicular at base. Cells very small, oval, with double walls and minute cellules in them, crowded, distinct. *Male*: Spike near top of branch, broadly conical, 5-jugate; scales rather large, entire, recurved; sometimes 3-4 spikes on one branch, each separated by a few leaves. Fruit not seen.

*Hab.* Forming small thick cushion-like tufts on branches of trees, in low, wet, and dark woods, "Forty-mile Bush," near Norsewood, County of Waipawa; October 1886: *W.C.*

3. *P. heterophylla*, sp. nov.

Plant small; rhizome wiry, creeping; stems erect, sub-rigid,  $1\frac{1}{2}$  inches high, 2 lines broad, distant, simple and forked, leafy to base, reddish-brown; branches few, long and straight, with a few short branchlets at top, pale reddish-green and semi-transparent. Leaves bright-green sub-amplexicaul, slightly decurrent both sides on stem, the ventral bases scarcely overlapping; those on main stems triangular or deltoid-oblong, their apices very obtuse, 12-14 irregular long laciniate teeth on ventral margin and at apex, of which about 6 are apical; leaves on the branches  $\frac{1}{10}$ th inch wide including stem, with fewer teeth; and those on the ultimate branchlets are exceedingly small, being only with the stem  $\frac{1}{20}$ th inch wide, oblong, the ventral margin rounded, the dorsal straight, and both entire; the apex truncate with 2-3 very long and distant spiny teeth. Involucral narrow, erect, with 3-4 long spreading laciniae at apex. Cells minute, sub-orbicular, crowded, walls thick with numerous minute intermediate cellules. Perianth small, terminal and solitary at end of stems and main branches, peduncled, narrow-campanulate,  $\frac{1}{10}$ th inch long, whitish; base tapering, constricted; mouth broad cilio-laciniate; teeth many, erect. Capsule sub-obovoid, brown; valves oblong-lanceolate, obtuse, dark-veined longitudinally; seta exerted, 2 lines long.

*Hab.* On logs and trunks of trees, wet woods near Danneverke, County of Waipawa; 1887: *W.C.*

*Obs.* This is a small delicate-looking slender wiry species, allied to *P. distans*, Col.,\* and *P. distinctifolia*, Lind. Its small leaves resemble those of *P. spinulosa*, Nees and Mont., a British species.

\* "Trans. N.Z. Inst.," vol. xix., p. 288.

4. *P. rotundifolia*, sp. nov.

Plant densely caespitose, sub-dendroid, erect, 1 inch high, dark olive-green, the young leaves at tips light-green; stem bare at base, forked, loosely branched above in 4–5 branchlets; tips recurved, drooping. Leaves small, close, imbricate, spreading, rotund,  $\frac{1}{5}$ th inch diameter, undulate, slightly decurrent, sub-amplexicaul, the portion adhering to stem being very small, margins minutely and regularly waved and finely serrulate (*sub lente*); dorsal margin recurved, entire near stem. Cells minute, orbicular, with thickened walls and very minute cellules in them, larger and oblong at base of leaf.

*Hab.* Among small herbage, shaded woods, base of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hill.*

§ II. Stems erect from a creeping rhizome, tall, much branched, dendroid.

5. *P. trispicata*, sp. nov.

Rhizome creeping, matted; plant densely caespitose; dendroid, erect, 4–4 $\frac{1}{2}$  inches high, main stem 1 $\frac{1}{2}$ –2 inches long, leafy from base, 3 lines wide, much branched at top; branches 1 $\frac{1}{2}$ –2 inches long, 2–2 $\frac{1}{2}$  lines broad, spreading, erect, dichotomous, branches and leaves flat. Leaves yellowish-green tinged with brown, alternate, imbricate; those on the main branches broadly sub-deltoid, 2 lines long (smaller on the branchlets); ventral margin curved, lacinate-toothed, the bases round and much produced, largely cilio-lacinate and overlapping; dorsal margin straight, nearly entire or with 1–2 small teeth, and set very obliquely on stem; apices truncate with 3–5 large irregular sub-lacinate teeth. Involucral leaves much the same, but erect, with their dorsal margin more ciliated. Cells broadly oval, distinct, filled with minute pellucid cellules. Perianth terminal on short lateral branchlets, sessile, compressed, whitish, 2 $\frac{1}{2}$  lines long, ovate, dimidiate, obtuse; mouth sub-urceolate; lips and apex largely lacinate-ciliate; laciniae bifid, acute, sub-flexuous, spreading, cellular. *Male* plant smaller and less robust; spikes terminal at tips of branches, mostly 3 (sometimes 2, 4,) together, shortly peduncled, 2 lines long, divergent, sub-triangular, acute, deeply channelled on one side; scales in 2 rows, large; tips recurved, the lower nearly entire, the upper shortly bidentate.

*Hab.* On trees and logs, damp woods near Danneverke. County of Waipawa; 1887: *W.C.*

*Obs.* A rather peculiar species from the shape of its perianth, and also from its conspicuous and divergent 3 male spikes.

6. *P. axillaris*, sp. nov.

Plant closely caespitose, pale green; rhizome wiry, creeping, much entangled, tough. Stems erect, leafy from base, 2–3

inches high, 3 lines wide, simple, forked at middle, branched at top into 4–5 short branchlets; tips recurved. Leaves alternate, rather distant, not imbricate, broadly oblong or somewhat sub-orbicular, wavy and concave, 2 lines long, apex much rounded; the ventral margin and apex distantly and irregularly cilio-lacinate; the dorsal margin entire, base slightly oblique and decurrent on stem. Cells orbicular, crowded, smaller at margins, their walls double, thickened, with minute cellules. Perianths few, scattered, axillary between branches, sessile, obconic-campanulate, 1 line long, compressed; apex rounded; lips ciliated, extending down on one side; dark-green.

*Hab.* On trees and logs, in woods with the preceding species, *P. trispicata*; 1887: *W.C.*

7. *P. subfasciculata*, sp. nov.

Plant dendroid, 2–3 inches high; rhizome creeping, long, wiry; stems slender, erect, sub-rigid, dark coloured, leafy from base, much branched; branches alternate, bipinnate, long, diffused, irregular, (often a long branch at right angles from main stem,) branchlets opposite, sometimes 4–6 short ones nearly together at top of branch, sub-fasciculate. Leaves light-green, sub-opposite, rather distant, scarcely overlapping at extreme margins, somewhat semi-lunar or sub-rhomboid-dimidiated, apex broad, rounded; those on main stems and branches 2 lines wide, on branchlets much smaller; ventral margin much curved and, with apex, lacinate toothed, sub 12 teeth, long, acute, irregular in size, distant, longer and closer at apex, few or none at base, basal margins slightly impinging, decurrent on stem, sinus between teeth broad and rounded; dorsal margin entire, oblique, slightly decurrent on stem. Involucral large, erect, apex much lacinate. Cells opaque, sub-orbicular, double-walled with minute intermediate cellules. Perianth rather small, dark-green, sessile, axillary between branchlets, broadly cuneate or sub-campanulate, slightly compressed; mouth large; lips rounded, cilio-lacinate; teeth irregular, larger in centre, acute, many-celled. Cells similar to those of leaves but more oblong.

*Hab.* On logs and trunks of trees, wet woods near Danneverke, County of Waipawa; 1887: *W.C.*

*Obs.* The nearest affinity of this species is with *P. exilis*, Col.\*

Genus 7. *Gottschea*, Nees.

\* Leaves stipulate.

1. *G. truncatula*, sp. nov.

Plant small, gregarious, prostrate,  $\frac{1}{2}$ – $\frac{3}{4}$  inch long, 4 lines wide, oblong, simple rarely forked, dark-green, leafy from base,

with numerous dark-purple rootlets. Leaves close, imbricate, very thin; ventral lobe oblong-ovate, tips rounded with 2-4 narrow plaits running obliquely from dorsal lobe to margin; margins minutely serrulate and irregularly sinuous and notched from the plaits; the upper basal margin largely ciliate; cilia capillary, long and wavy, composed of several single cells placed longitudinally: the dorsal lobe short, only  $\frac{2}{3}$  length of the ventral, sub-trapeziform or sub-cordate-dimidiolate, minutely serrulate, its upper basal margin rounded and produced beyond the ventral lobe but not really wider than it; apex broad and very truncate. Cells sub-orbicular, close, with double walls containing minute pellucid circular cellules. Stipules large, somewhat sub-quadrate in outline, narrowest at base, 3-4-lobed, much lacinate and largely ciliate; cilia long, jointed, very flexuous and acute; cells narrow-oblong, their ends obtuse and truncate, closely compacted. On the stem between the leaves are several long narrow irregular cellular processes or leaflets, in 2-3 rows, patent and much ciliated.

*Hab.* On the ground, in damp woods near Danneverke, County of Waipawa; 1887: *W.C.*

*Obs.* A species near *G. trichotoma*, Col.,\* but differing in being much smaller and simple, with notched margins to its leaves, and particularly in its very short and broadly truncate dorsal lobe.

## 2. *G. flavo-virens*, sp. nov.

Plant very small, gregarious, prostrate, broadly obovate, sub  $\frac{1}{2}$  inch long, simple; yellowish-green with red rootlets at base. Leaves oblong-ovate, obtuse, margins slightly serrate; the ventral basal portion shortly lacinate-serrate; the margin of the dorsal lobe very slightly serrulate, tip oblique, rounded, the base slightly produced, its margin nearly entire. Stipule large, sub-quadrate, bilobed; lobes broad, coarsely lacinate with numerous broad laciniæ; sinus large, extending  $\frac{1}{3}$ rd down. Cells small, orbicular and very regular, with minute pellucid cellules in angles between cells; oblong and larger at base of stipule.

*Hab.* On the ground, sides of streams, in woods with the preceding species, *G. truncatula*; 1887: *W.C.*

*Obs.* A species having affinity with *G. pallescens*, Col., and *G. late-virens*, Col.†

## 3. *G. squarrosa*, sp. nov.

Plant large, sub-ascending, 7 inches long. Stem stout, dark-brown, leafy, simple, with 2-4 short and forked branchlets at top; base bare. Leaves alternate, large, green, very distant

\* "Trans. N.Z. Inst.," vol. xviii., p. 240.

† "Trans. N.Z. Inst.," vol. xviii., pp. 238 and 241.

and squarrose on main stem, which is 5–6 lines wide including leaves, decreasing in size downwards towards base, close and sub-imbricate on branches, conduplicate, lobes united at lower dorsal margin, which is thickened and entire; dorsal lobe oblique, cordate-acuminate, the base very much produced and rounded semi-orbicular, margin entire; tip suddenly acuminate, acute; anterior margin uneven, wavy with minute plaits, both upper margins and tip finely denticulate; ventral lobe much longer than dorsal, sub-oblong-trapeziform, apex oblique, obtuse, the anterior margin nearly straight; margins minutely serrulate with a few (2–3) small ciliae near base; the apices of the two lobes very divergent. Stipules distant from base of leaves, patent, large, rotund,  $1\frac{1}{2}$  lines diameter, retuse; margins entire, slightly and sparingly ciliate at apex and on the upper sides; finely and obsoletely waved laterally, with a long thick longitudinal plait in the centre. Cells rather opaque, crowded, oval; walls thick with minute cellulules in the angles. 2–3 small linear segments (phyllodia) on main stem in the axils of the leaves, their margins entire with 2 long hair-like ciliae at the tip of each.

*Hab.* High lands, woods north of Napier, Hawke's Bay; 1886: Mr. A. Hamilton.

*Obs.* This is another very fine species, pretty closely allied to *G. nobilis*, Nees, and to *G. dichotoma*, Col.,\* but differing considerably in many characters: as in the great distance between the stem leaves, and their squarrose habit, in the form and serratures of leaves, lobes, stipules, and phyllodia, and in their cells.

\*\* Leaves without stipules.

#### 4. *G. plumulosa*, sp. nov.

Plant densely tufted, erect,  $1\frac{1}{2}$  inches high; yellowish-green, becoming light-brown in age; stems stout, 3 lines wide including leaves, sub-obovate-linear, leafy to base, simple and forked, sometimes with two short opposite lateral branchlets at tips; tips nodding, sub-circinnate. Leaves exceedingly thin, very close-set, bifarious, regular, imbricate, spreading, their lobes conduplicate united at the dorsal margin, the dorsal lobe a little smaller, both lobes overlapping at dorsal and ventral bases, deeply bifid at apex; apical segments long, laciniate, acuminate; margins of both lobes largely laciniate-ciliate; ciliae very long, 2–3 branched, acute, and very cellular. Stipules 0. Cells large, very distinct, oval; their thickish double walls containing numerous minute cellulules.

*Hab.* Forests, Ruatahuna, County of Whakatane; 1886  
Mr. A. Hamilton.

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\* "Trans. N.Z. Inst.," vol. xviii., p. 284.



*Obs.* This species is allied to *G. pinnatifolia*, Nees; and also to *G. ciliigera*, Hook. f. and Taylor, another large species; but it is a much smaller plant than either, and widely differing in habit, and the form of its compound lacinate ciliæ and cells. Sir J. D. Hooker has united those two species in the "Hand-book N.Z. Flora," p. 514, but I venture to consider them to be very distinct. This small species is a truly elegant plant, and takes its trivial name from its nodding plume-like tips.

5. *G. homophylla*, sp. nov.

Plant small, prostrate on mosses, and sub-ascending. Stems  $\frac{3}{4}$ –1 inch long, simple and forked near base, ovate-acuminate and broadly lanceolate, 4 lines wide, leafy throughout, with a few fine rootlets at base; both sides of the plant nearly alike; colour a pale whitish-brown (which may, however, have happened from being badly dried). Leaves closely imbricate, sub-falcate, excessively thin, broadly ovate; both dorsal and ventral lobes sub-similar in shape, ovate-acuminate, the ventral a little more acuminate; margins entire; tips serrate; dorsal lobe concave, united to ventral lobe within margin, which extends in a narrow line beyond it; the stem completely hidden on both upper and under sides through the leaves closely and largely overlapping. Stipules 0. Cells small, sub-orbicular and somewhat obscure, with minute starry dots at their angles.

*Hab.* Forests near Waikare Lake, County of Whakatane; 1886: Mr. A. Hamilton.

*Obs.* This is a most peculiar and very distinct species, widely differing from all others known to me. Its upper and under surfaces are so very much alike that it is difficult to distinguish them, save by their rootlets at their bases; there are also its entire margins, and it being without stipules; and then the most curious structure of its cellules and their unique star-like appendages. Unfortunately, I have seen but a few whole specimens (about half-a-dozen); it seems to have been collected hastily among other and larger *Hepatica* and mosses, whence I picked it out.

Genus 16. *Isotachis*, Mitten.

1. *I. rosacea*, sp. nov.

Plant closely gregarious, erect, delicate. Stem rather stout, dark-coloured, 3 inches high, narrow, 1 line wide including leaves, leafy throughout, 1–2 branches above; branches  $\frac{1}{2}$ – $1\frac{1}{2}$  inches long, spreading; tips rounded, nodding. Leaves very close, uniform and regular, sub-opposite on main stem, and opposite on branches, all rose-pink, (also the stipules,) sub-quadrangle, apices quadrifid; lobes free, sinuses large, coarsely denticulate; tips acute; dorsal margin entire; ventral margin

denticulate; sub-imbricate and closely adpressed at their dorsal bases completely hiding the stem; their ventral bases patent. Stipules patent, cordate, bifid; apices obtuse; margins sub-ciliate-denticulate; ciliæ free, rather distant; bases sub-amplexicaul. Cells oval and sub-orbicular, smaller at margins, larger oblong and parallelogrammatic in the centre and at the base.

*Hab.* High lands, interior, north of Napier; 1886: *Mr. A. Hamilton*.

*Obs.* A truly graceful species; pretty nearly allied to *I. lyallii*,\* Hook. fil., but differing in size, colour, shape of leaves and stipules, and in the form, etc., of its cellules. Its delicate rose-pink colour, alike throughout, enhances its beauty, and makes it an attractive and elegant object.

#### Genus 17. *Trichocolea*, Nees.

##### 1. *T. elegans*, sp. nov.

Plant prostrate, spreading in thick matted tufts or patches, with rather long creeping stems or ultimate branches (2–3 inches), bright green, sub-quadri-pinnate. Stems minutely and closely hairy, their leaves broadly transverse rather distant; secondary branches bipinnate, horizontal, broadly ovate or rhomboid in outline, presenting a regular fern-like appearance; branches and branchlets cylindrical, symmetrical, radiating, spreading; ultimate branchlets compacted, sub-globose, and pale at tips. Leaves numerous, sub-verticillate; segments wholly capillary, branched, jointed, acute, implexed. Stipules multifid, capillary spreading, much like leaves. Peduncle very stout, 1 line long, succulent, slightly hairy, erect from upper surface of branches near top of frond, sometimes geminate. Calyptra oblong, scaly, very hairy at top, hairs whitish, spreading; scales long, ovate-acuminate, laciniate-ciliate, recurved.

*Hab.* On rotten logs, wet shaded woods, Norsewood, County of Waipawa; 1886; and also near Danneverke, same county; May, 1887; *W.C. Glenross*, County of Hawke's Bay; October, 1887: *Mr. D. P. Balfour*.

*Obs.* This is a truly elegant little plant; its pleasing green tufts, with their central short flat bipinnate radiating branchlets symmetrically disposed, give it a very neat appearance; which is still further heightened by its long slender creeping stems or branches. While in shape and habit it differs largely from its congeners, *T. tomentella* and *T. lanata*, yet it approaches them pretty nearly in the form of its leaves and stipules; which, however, are still more multifid and capillary.

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\* Originally discovered on the summits of the neighbouring high mountain (Ruahine) range.

Genus 23. *Frullania*, Raddi.1. *F. viridis*, sp. nov.

Plant creeping, 1–2 $\frac{1}{2}$  inches long, bipinnate, green; branches numerous, rather long, free, spreading, somewhat soft. Leaves imbricate and closely set, rotund-reniform, patent; margins entire and slightly irregular; lobule minute, arched, green; tip sub-acute. Stipules adpressed, reniform-orbicular; margins slightly uneven, shortly bifid, sinus cuneate, broad. Cells minute, orbicular, opaque, larger at bases. Perianth smooth, oblong, sub-inflated, triquetrous, largely obtusely angled on one side, with a corresponding central depression on the other; apex obtuse, mucronulate.

*Hab.* On branches of trees, forming thickish patches, forests at Danneverke, County of Waipawa; 1887: *W.C.*

*Obs.* A species allied to *F. squarrosula*, Hook. f., but of a different habit, form, and colour, with differently shaped leaves and stipules, and the perianth more inflated and keeled.

2. *F. echinella*, sp. nov.

Plant small, purple-brown, sub-rigid, creeping, 1–2 inches long; stems closely intermixed and overlapping; branches dichotomous, leafy, narrow,  $\frac{1}{50}$ th inch wide including leaves; branchlets pinnate. Leaves alternate, imbricate, broadly oval, their tips sub-recurved; young leaves green, brownish on upper surface with narrow dark margins; lobule small, not produced beyond leaf, arched with acute tip; corner of leaf not inflexed. Cells regular, orbicular, with a minute pellucid round cellule in each outer angle. Stipules sub-orbicular, longer than broad, margins slightly uneven, bifid nearly to base, angles of lobes acute. Perianth sub-obovate, triquetrous, sub-compressed, one side slightly convex, the other carinate, finely and densely muricate-echinulate; apex retuse, mucronate. Involucral leaves margins entire.

*Hab.* On branches of living trees, chiefly *Myrtus bullata*, forming tolerably large and thick patches; sides of streams, forests near Danneverke, County of Waipawa: 1887: *W.C.*

*Obs.* This species, from its peculiar perianth, will no doubt belong to the new sub-genus *Trachicolea*\* of Dr. Spruce; one of the smallest sections of this very large and extensive genus.

Genus 24. *Fossombronina*, Raddi.1. *F. gregaria*, sp. nov.

Plant densely caespitose, erect, 2 inches high, succulent, fragile, pale green. Stems simple, rarely forked, with many

\* In his "Hepaticæ Amazonicæ et Andinæ," p. 31. An excellent and exhaustive work of nearly 600 closely printed pages, reflecting the highest credit on the author, also on the Botanical Society of Edinburgh, under whose auspices it was recently published.

purple rootlets. Leaves large,  $3\frac{1}{2}$ –4 lines broad, imbricate, pellucid, waved and crumpled, semi-amplexicaul, margins sinuate; the upper leaves sub-reniform, sub-rosulate at top of stem; the lower, sub-quadrangle and largely decurrent. Cells very large, of various shapes and sizes, broadly hexangular, oblong, sub-quadrangular and sub-orbicular. Perianth terminal and sub-terminal, broadly campanulate,  $2\frac{1}{2}$  lines long, 2 lines broad, mouth open, spreading, much waved, margin sinuate, entire; colour and cells as in leaves. Seta 9–15 lines long, erect, stoutish, white. Capsule oblong, very obtuse, minutely reticulate, dark-brown; valves 4, split to base, but breaking up into quadrangular bits after the manner of *Petalophyllum*. Elaters brown, cylindrical, flexuous, bi-spiral, forming an unbroken curve or loop at one end, and returning, so that the two ends equally meet at the opposite end; tips truncate. Spores orbicular, echinulate.

*Hab.* Woods at Tarawera, hilly country north of Napier; 1886: Mr. H. Hill.

*Obs.* A very peculiar species, from its erect and densely gregarious habit of growth, so different from that of its known congeners. In determining the curious elaters of this species I have been generously and largely aided by Dr. W. I. Spencer, F.L.S.

Genus 27. *Zoopsis*, Hook. f. and Tayl.

1. *Z. tenuicaulis*, sp. nov.

Plant minute almost capillary, straight and flexuous, pale green; frond prostrate, delicate, highly cellular, transparent, few-branched, 1– $1\frac{1}{2}$  inches long,  $\frac{1}{10}$ th inch broad; midrib strong and dark, a single row of large sub-oblong-quadrangle cells on each side, with 2 fascicled claw- (or finger-and-thumb-) like lobes, alternately and pretty regularly disposed on both sides, the upper lobe of 3 (rarely 4, 5,) cells always the longest and sub-acute, the lower lobe of 2 (rarely 3) cells stouter and obtuse; the cells of the lobes oblong-orbicular, the lowest one being much larger, the upper (of the 3-celled lobe) very small and curved; the lobes on the lower part of the stem distant, those on the upper portion and on the branchlets are much closer. Flowers and fruit not seen.

*Hab.* Among *Symphyogyna*, and other low close-growing *Hepaticæ*, from base of Tongariro Mountain Range, County of East Taupo; 1887: Mr. H. Hill.

*Obs.* A very minute microscopical plant, picked out from among other *Hepaticæ*; allied to *Z. argentea*, Hook. f. and Tayl., but much more slender and very distinct.

2. (?) *Z. ciliata*, sp. nov.

Plant small, tufted, delicate, flaccid, erect,  $\frac{1}{2}$ – $\frac{3}{4}$  inch high, bright grass-green. Fronds flat, a little waved,  $\frac{1}{10}$ – $\frac{1}{2}$  inch

broad at base, simple, lobed, and digitate above; lobes long, linear,  $\frac{1}{10}$  -  $\frac{1}{20}$  inch wide, sometimes forked and trifid, obtuse and sub-acute; margins slightly sub-sinuate and denticulate, ciliate with scattered long brown glandular flexuous flattish ciliæ; the bases of fronds red-brown and hairy; hairs long and flexuous. Cells large, irregular, of various sizes and shapes, mostly oblong-hexagonal, smaller, regular, and sub-quadrangular at margins; minute, obovate and lanceolate, obtuse, sub-sessile lobes (or sacs?) are sometimes scattered (occasionally 2-3 together) on margins and disk of frond, also at apex, giving it a proliferous appearance; their cells are smaller and orbicular.

*Hab.* Among other densely-growing *Hepaticæ*, on branches of living trees, woods near Norsewood, County of Waipawa; October, 1886: *W.C.*

*Obs.* This is a curious and strange-looking little plant; to me, almost unique in appearance, etc.; its fructification, however, has not yet been detected, and therefore it is only now placed provisionally here as a species of *Zoopsis*. To this small endemic genus of frondose *Hepatica* it seems to be more naturally allied than to any other; at the same time there are grave differences. I may also observe that I have only now met with this plant, in this one locality, though pretty plentiful there.

### Genus 30. *Symphogyna*, Mont. and Nees.

#### 1. *S. connivens*, sp. nov.

Plant terrestrial, small, simple, gregarious, stipitate, erect; delicate pale-green; root (and stipe) dark pink, cylindrical, succulent, slightly hairy; hairs patent; stipe  $\frac{3}{4}$  inch long, flexuous, smooth, glossy, succulent; frond oblate-orbicular, broader than long, 6-8 lines broad, 4-5 lines long, dichotomous, 2-branched from top of stipe; branches equal, broad at bases, conniving and forming a cup-like cavity at top of stipe, wavy, not decurrent, on stipe; each branch 2-3-lobed or sub-branched, and cut nearly to base; each lobe deeply divided; ultimate lobes short, broad, truncate, nerved; margins largely serrate; serratures broad, long, and sharp, with 5-9 cells in each; cells large, sub-orbicular, their walls thick and dark. Involucre very small at bases of main branches on the upper surface, 2 on a frond, much and finely lacinate; lacinæ recurved, somewhat glossy. Calyptra (immature) shortly peduncled.

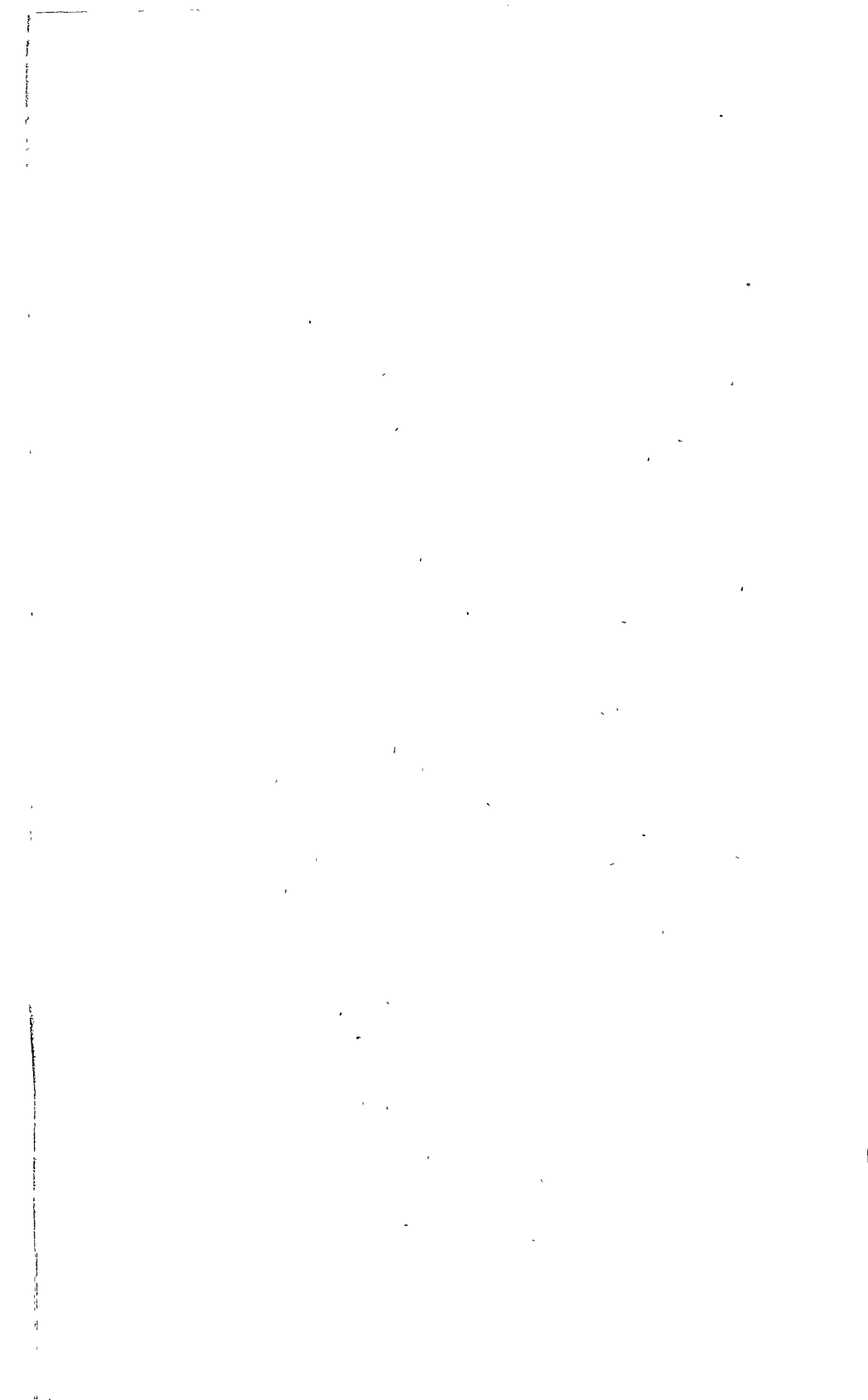
*Hab.* Among mosses and other small plants, base of Mount Tongariro, County of East Taupo; 1887: *Mr. H. Hull.*



*RANUNCULUS TENUIS*. J.B.

*J. Buchanan. del.*

*C.H.P. lith.*





*NOTOTHLASPI*

*HOOKERI. J.B.*