

III. *Hepaticæ*.

By WILLIAM MITTEN, A.L.S.

NINE species of *Jungermannia* and one *Marchantia*, were gathered by Dr. Hooker. These were arranged in 5 genera, and 5 of the species were described as new, the remainder being similar to species found elsewhere; none of the species were especially remarkable. Mr. Moseley collected at the time of the "Challenger's" stay 12 species, 7 of which were different from those obtained by Dr. Hooker, and 6 genera were also added to the flora. Fourteen species were found by Mr. Eaton; of these 8 species and 2 genera were additional to those previously known, bringing the whole number of the *Hepaticæ* up to 25.

The *Hepaticæ* of Kerguelen are allied most nearly to those of the Auckland and Campbell's Islands, and of Fuegia.

*Noteroclada porphyrorhiza*, *Leioscyphus pallens*, and *Teinnotoma quadripartita*, are found also in Fuegia. *Jungermannia colorata*, and *Symphogyna podophylla*, are found at the Cape of Good Hope. The former is, however, very widely distributed in austral regions. As with the mosses, it is remarkable how many additions were made to the flora by the small number of specimens obtained by each collector.

1. **Plagiochila heterodonta**, *Hook. f. et Tayl. Fl. Antarct.* 428, t. 157, f. 2.

Christmas Harbour, on moist rocks, *Hooker*. Royal Sound, barren, *Eaton*.

The specimens closely resemble those gathered by Dr. Hooker; it appears to be always a small species.

2. **Plagiochila minutula**, *Hook. f. et Tayl. Flor. Antarct.* 427, t. 157, f. 1.

Christmas Harbour, on rocks and the ground, *Hooker*.

1. **Leioscyphus turgescens**, *Hook. f. et Tayl. Fl. Antarct.* 150, t. 64, f. 2.

Hab. Royal Sound, amongst *Ditrichum Hookeri*, *Eaton*. (Lord Auckland's group).

2. **Leioscyphus pallens**, *Mitt. in Journ. Linn. Soc.* xv., 68. Caulis procumbens ascendensque, parce ramosus. Folia sursum secunda, conniventia, imbricata, orbiculata, caviuscula, integerrima, cellulis rotundis parietibus crassiusculis areolata. Amphigastria erecto-patentia, lanceolata, profunde bifida, laciniis elongatis subulatis. Folia involucralia majora, conformia; amphigastrio parvo quadrifido laciniis dentatis integerrimisve. Perianthium obovatum, ore truncato integerrimo.

Royal Sound, associated with *L. turgescens*, barren, *Eaton*.

Stems from an inch to an inch and a half long, seldom branched, with the leaves  $\frac{1}{2}$  line wide. Leaves pale olive-green, becoming in age brown, rather firm, not

collapsing when dry, composed of rounded cells which at first contain small round granules that disappear in the older leaves. Stipules  $\frac{1}{2}$  line long, the one immediately under the perianth is small and easily overlooked. Perianth compressed. No capsuliferous stems have been seen.

It appears that in this species, and in some others of the same genus, the compressed truncate perianth is the result of the small size of the involucreal stipule, which in the coalescence of the leaves of which the perianth is theoretically formed, is too small to affect its form, the reverse of which is so evident in the perianth of *Lophocolea*.

Tab. III., Fig. vi., plant *nat. size*; 2. leaf detached; 3. stipule from the stem; 4. perianth as seen laterally with involucreal leaves; 5. stipule next the perianth; all *magnified*.

1. **Lophocolea pallidovirens**, *Hook. f. et Tayl. Fl. Antarct.* 439, t. 159, t. 9.

Kerguelen Island, *Moseley*. Near Vulcan Cove, barren, *Eaton*. (Fuegia).

2. **Lophocolea Novæ Zealandiæ**, *Lehm. et Lindenb.* (Jungermannia).

Royal Sound, fragments amongst *Ditrichum Hookeri*. Hill N.W. of Mount Crozier, with young perianths, *Eaton*. (New Zealand and Lord Auckland's group).

3. **Lophocolea humifusa**, *Hook. f. et Tayl. Fl. Antarct.* 436, t. 159, f. v.

Christmas Harbour, *Hooker*; near Observatory Bay, barren, *Eaton*.

The specimens are pale yellowish green, and seem not different from *L. bidentata*, with which it agrees in perianth.

1. **Teinnoma quadripartita**, *Hook. Musc. Exot.* 117. (Jungermannia).

Kerguelen Island, a few small fragments, *Moseley*. Gathered also amongst *Dicrana* at Christmas Harbour by *Hooker*.

1. **Jungermannia cylindriciformis**, *Mitt. in Journ. Linn. Soc.* xv. Exilis. Caulis procumbens, ascendens, subsimplex, vix radicans. Folia subalterna, antice incurva, oblongo-ovalia, obtusa, sinu parvo obtuso obtuse bidentata, dentibus sæpe conniventer incurvis; involucrealia minora, acute bidentata vel caulinis conformia. Perianthium elongatum, cylindricæum, obtusum, apice plicatum.

Royal Sound, in very small quantity with perianths amongst *Ditrichum Hookeri*, and hill N.W. of Mount Crozier, with *Scapania clandestina*, *Eaton*.

Stems about 2 lines long. Leaves  $\frac{1}{6}$  line long, brownish green. Perianth 1 line long, of the same colour as the leaves. This minute plant is nearly related to *J. inflata*, Huds., having the same cylindrical perianth, and involucreal leaves not much different from those of the stem, which are the characters of the genus *Gymnocolea*, Dumort, which comprises besides the European *J. inflata*, and the *J. turbinata*, Raddi.

Tab. III., Fig. vii.; 1, plant *nat. size*; 2 and 3, perianth and involucreal leaves, dorsal and lateral view; 4, cauline leaf, expanded; all *magnified*.

2. **Jungermannia leucorhiza**, *Mitt. in Journ. Linn. Soc.* xv. 68. Caulis procumbens, radicellis pallidis. Folia laxè inserta, quadrata subrotundave, sinu acuto obtusove bilobata, interdum lobo altero minore; lobis acutis obtusisve, incurvis; cellulis rotundatis et ovali-hexagonis areolata.

Kerguelen Island, in very small quantity amongst mosses, barren, *Moseley*.

Stems less than 1 inch long, with the leaves  $\frac{1}{2}$  line wide. Leaves green, tinged with brown.

Incomplete specimens of a species not before noticed in the Antarctic regions, but which appears to be near to the European *J. ventricosa*, Dicks, and to some states of *J. barbata*.

3. **Jungermannia colorata**, *Lehm. et Lindenb.*

Christmas Harbour, abundant on the hills, *Hooker, Moseley* (with perianths).

1. **Solenostoma humilis**, *Hook. f. et Tayl. Fl. Antarct.* ii. 434, t. 158, f. 6. (*Jungermannia*); *J. inundata*, *Flor. Nov. Zealand.* 128, t. 93, f. 3.

Hab. Christmas Harbour, barren, *Hooker*. A few fragments with one perianth, *Moseley*.

Both *S. humilis* and *J. inundata* were originally described as stipulate species, no amphigastria have, however, been since found on the specimens. It is probable that the figure of the supposed stipule of *J. humilis*, may have been drawn from a fragment of *Leioscyphus turgescens*.

**Scapania**, Lind (ex parte). Perianthium terminale, læve, a tergo ventreque compressum, ante capsulæ emissionem apice decurvum, herbaceo-membranaceum, ore truncato. Involueri folia 2, libera, caulinis conformia.—Plantæ terricolæ. Rami erecti ascendentesve, simplices vel furcati. Folia fere ubique æqualia, bifaria, equitantia, profunde biloba, laciniis subæqualibus apicibus rotundatis vel plus minus bifidis, textura e cellulis parvis. Amphigastria nulla.

This description is that of the Synopsis Hepaticarum, with slight modification, it applies to *S. densifolia*, *vertebralis*, and *chloroleuca*, all so intimately related that the possibility of their being forms of one species may be conjectured. These differ from the chiefly European species which were included in the original idea of *Scapania*, and which are now by right of priority assigned to *Martinellia*, Gray, in having leaves not keeled in the space between the equal lobes, a peculiarity which gives the plants a different aspect. The perianth known from a single example on *S. vertebralis*, is like that found in *Martinellia*, but is narrowed upwards, truncate, the mouth bent over and denticulate.

1. **Scapania densifolia**, *Hook. Musc. Exot.* 36 (*Jungermannia*).

Kerguelen Island, *Moseley*.

The specimens agree with those gathered by Menzies, and are of the same brown colour. The distinction between *S. densifolia* and its congeners may be thus stated:—*S. densifolia*, Hook., lobis foliorum apice integris rarius emarginatis.—*S. vertebralis*, Tayl., lobis apice exsectis.—*S. chloroleuca*, Hook. f. et Tayl., lobis apice bifidis.

2. **Scapania clandestina**, *Mont. Bot. Crypt. Astrolabe*, t. 16, f. 4. *Balantiopsis incrassata*, *Mitt. in Journ. Soc. Linn.* xv. 197.

Hill N.W. of Mt. Crozier, in very small quantity with *J. cylindriformis*, *Eaton*.

The stems of this small plant are about  $\frac{1}{2}$  inch high, and with the leaves  $\frac{1}{2}$  line wide. Leaves firm, with small round cells; lobes unequal and differing in their direction, the dorsal patent, the ventral nearly twice as large and divergent. In the Kerguelen specimens the space between the lobes is keeled and curved, and both the lobes are denticulate, except the superior edge of the ventral lobe which is only denticulate towards the apex, and like that of the dorsal lobe is terminated by two larger teeth (hence bidentate, with a small rounded sinus). In this particular they nearly resemble the leaves of *Balantiopsis diplophylla* and *B. erinacea*, *Tayl.* (*Scapania*), but differ in their dense areolation. No authentic specimen has been seen of *S. clandestina*, *Mont.*, but the figure quoted agrees except in the arcuation of the carina. A single stem picked from a tuft of *Aneura* from New Zealand has the lobes more nearly equal, the carina straight, very much longer, and all the marginal teeth more spiniform; it is probable as suspected in the Synopsis *Hepaticarum*, that the plant in a complete state would be different from the imperfect specimens yet seen. This species departs from *S. densifolia* and its allies in the leaves being carinate, and thus corresponds to *Martinellia*; it has, however, the apices of its leaves bedentate, which give it a different look from any of the species referred to that genus.

1. **Cesia atropcapilla**, *Hook. f. et Tayl. Fl. Antarct.* 423.

Foul haven, on clay banks, *Hooker*; in small blackish patches closely interwoven, *Moseley*.

From the examination of some branches of the specimens collected by Dr. Hooker it appears that fertile shoots would have their upper leaves nearly or quite entire and nearly orbicular in form.

1. **Lembidium ventrosus**, *Mitt. in Journ. Soc. Linn.* xv., 69. *Caulis humilis, late compacteque cæspitosus, ascendens vel erectus, arcuatus, crassus, ramosus, innovationibus flagelliformibus ex amphigastriorum angulis emittens. Folia inferiora remota, superiora majora, insertione fere verticalia, patentia, apicem caulis versus imbricata, rotundata, profunde concava, apice rotundata sinu subindistincto subretusa, cellulis parvis parietibus angustis areolata. Amphigastria parva, cauli appressa, subtriangulari-ovata, apice subemarginata. Perianthium in ramo superne valde incrassato, foliis amphigastrioque involucralibus convolutis ovatis apice breviter bitri-denticulatis, trigonum, ovatum, apice plicatum, ore laciniis conniventibus denticulatis obtusum.*

Hill N.W. of Mt. Crozier, in dense tufts on the earth, with capsules just rising, *Eaton*.

In extensive brownish olive-green patches. Stems about 4 lines high, with the leaves scarcely  $\frac{1}{2}$  line wide, closely congested and cohering with very slender

hyaline rootlets. Perianth large for the size of the plant, arising from the apex of a thickened branch; apex obtuse before the egress of the rather large spherical capsule, but afterwards sub-truncate. Spores minute, round, smooth, brown, accompanied by fusiform moniliate fibres.

*L. nutans*, Hook. f. et Tayl. *Fl. Nov. Zeald.* 160, t. 65, f. 8, is a larger species, and appeared by itself different from any genus that has been described, whereas *L. ventrosum* resembles the *Jungermannia Francisci* of Hooker's Brit. *Jungermannia*, t. 49, a species which also produces thickly fleshy stolons, is irregular in the emargination of its leaves, has the same kind of stipules as well as perianth, and is therefore a species of *Lembidium*. How this genus or group of species may be distinguished from the *Cephalozia* of Dumortier must remain for examination.

Tab. III., Fig. viii.; 1, plant of nat. size; 2, portion of stem with leaves and stipules; 3, perianth and involucral leaves on lateral branch;—all *magnified*.

1. **Herpocladium fissum**, Mitt. in *Journ. Linn. Soc.* xv., 69. Caulis perpusillus, firmus, crassiusculus. Folia alterna, patentia, ovata, obtusa, apice incurva, sinu parvo acuto breviter acute bidentata, concava, basi utroque caulem ad medium diametrum tegentia, margine dorsali interdum flexura sinuata rarius unidentata, cellulis densis obscuris areolata. Amphigastria foliis similia, patula divaricatave, apice obtusa, integra.

Kerguelen Island, *Moseley*.

Stems 3–4 lines long, with the leaves  $\frac{1}{4}$  line wide. The entire plant almost black.

Tab. III., Fig. ix.; 1, plant of nat. size; 2, portion of stem, with leaves and stipule from the dorsal side; 3, lateral view of leaf and spreading stipule; 4, leaf detached and expanded;—all *magnified*.

1. **Tylimanthus viridis**, Mitt. in *Journ. Linn. Soc.* xv., 197. Humilis. Caulis erectus ascendensve, apice decurvus, subsimplex. Folia distiche expansa, oblongo-quadrata, apice oblique sinu lato subtruncato-bilobata; lobis obtusis, dorsali majore apicem versus interdum subdentatis, cellulis parvis rotundatis limitibus pellucidis areolata.

Royal Sound, and hill N.W. of Mount Crozier, all barren, *Eaton*.

Stems  $\frac{1}{2}$  inch high, green, with the leaves scarcely 2 lines wide. Leaves green, frequently convex from the recurvation of the margin. This nearly resembles *T. tenellus*, Tayl. (*Gymnanthe*) from Tasmania, but it seems to be a smaller species.

Tab. III., Fig. x.; 1, plant of nat. size; 2, portion of stem with leaves enlarged.

1. **Marsupidium excisum**, Mitt. in *Journ. Linn. Soc.* XV., 69. Caulis pri-marius repens, exinde ascendens, pallidus. Folia inferiora minora, deinde superiore minora, omnia oblongo-quadrata, concava, sinu obtuso bidentata, integerrima subcrenatave, lobis latis acutis incurvis, cellulis protuberantibus papulosa.

Royal Sound, with *Acrocladium politum* and *Pogonatum alpinum*, barren, *Eaton*.

Primary stems of the same colour as the leaves, fleshy, obscure, creeping; from these arise erect or ascending simple or branched shoots, which are arcuate, their points attenuated and decurved. The leaves where largest are about  $\frac{1}{2}$  line long, and when flattened of the same width, of a pale obscure olive-green; bases not decurrent; insertion variable but generally oblique; margins entire, or obtusely subcrenate; areolation of hexagonal or rounded cells with thin walls, enclosing a few green granules and projecting on both surfaces, but most on the external, as hyaline papulæ. Papulæ of the same kind are also present on the younger stems, but less prominent.

No kind of inflorescence has been seen on this species, and its location here is conjectured from its having the same habit as *M. Knightii*, from New Zealand.

Tab. III., Fig. xi.; 1, plant of *nat. size*; 2, part of stem with leaves; 3, cells from middle of leaf; both *magnified*.

1. **Fossombronia australis**, *Mitt. in Journ. Soc. Linn. XV.*, 73. Caulis cæspitosus, prostratus vel ascendens, arcuatus, radicellis purpureis. Folia subquadrata, angulata, margine flexuosa, antice incurva. Perianthium turbinatum, margine flexuosum, angulatum, semina rotunda limbo hyalino lævia.

Kerguelen Island, *Moseley*. Royal Sound, and near Vulcan Cove, with young capsules, *Eaton*. (Heard Island, *Moseley*).

Some of the specimens are very large, with arcuate stems more than an inch long, producing many purple rootlets. The leaves are 1 line long by about  $1\frac{1}{2}$  wide, green, with pellucid cells.

2. **Fossombronia pusilla**, *Linn.*

Christmas Harbour, amongst moss, *Hooker*.

1. **Noteroclada porphyrorhiza**, *Nees*; *N. confluens*, *Fl. Antarct.* 446, t. 161, f. 7.

Christmas Harbour, on moist banks, *Hooker*.

1. **Symphogyna podophylla**, *Thumb.* (Jungermannia); *Gottsche, Lindenb. et Nees Syn. Hepat.* 481.

Near Vulcan Cove; Royal Sound; hill N.W. of Mount Crozier; all without fructification, *Eaton*.

1. **Aneura multifida**, *Linn.* (Jungermannia).

West side of Swain's Bay, on boggy ground, and near Vulcan Cove, all barren, *Eaton*.

2. **Aneura pinguis**, *Linn.* (Jungermannia).

West side of Swain's Bay, small and barren, *Eaton*.

1. **Marchantia polymorpha**, *Linn.*

Christmas Harbour; *Hooker, Moseley*; Royal Sound and Swain's Bay, *Eaton*.

All the specimens produce scyphi, but are otherwise barren.

