

Fig. *Pottia obliqua*.

1. Capsule and operculum.
2. Perichæatial leaf (outer).
3. Perichæatial leaf (inner).
4. Stem leaves (upper).

Pottia douglasii.

1. Capsule and operculum.
2. Calyptra.
3. Perichæatial leaf (inner).
4. Perichæatial leaf (outer).
5. Stem leaf (upper).

ART. XXIX.—*Musci: Notes on the Genus Gymnostomum, with Descriptions of New Species.*

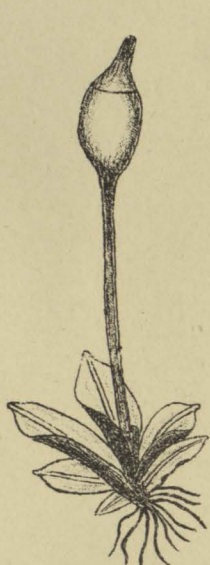
By ROBERT BROWN.

[Read before the Philosophical Institute of Canterbury, 1st November, 1893.]

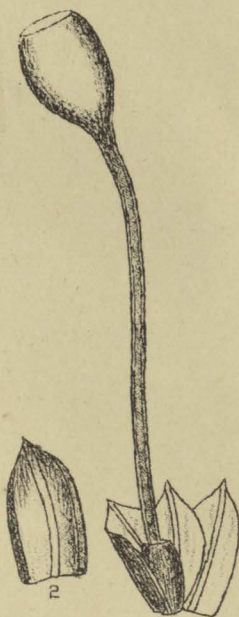
Plates XXXV.—XXXVII.

THE genus *Gymnostomum* is distinguished from the other allied genera of mosses by its species being *perennial*, and the cellular tissue of the upper portion of their leaves being small and dense; also in the absence of a peristome. In the genus *Pottia*, which is closely allied to it, the peristome is also absent, but species of the latter are either *annual* or *biennial*, and the cellular tissue is large and more succulent. In all other respects these two genera are similar, having also the same habitats, and being similar in appearance, which will account for Mr. Charles Knight (in his description of certain mosses, published in vol. vii. of the "Transactions and Proceedings of the New Zealand Institute," p. 354) placing *G. areolatum* in the genus *Gymnostomum* instead of that of *Pottia*, to which, from its large cell-structure, it probably belongs. These mosses are generally found on damp banks, on the ground, and are in fruit from October till February or March. Species of both genera are often seen growing on the same bank.

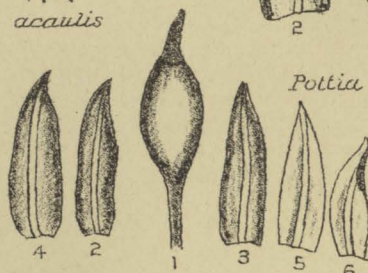
Since the publication of the "Handbook of the Flora of New Zealand" I have discovered no record of any new species of the genus *Gymnostomum* excepting Mr. Knight's descriptions referred to above. It is to be regretted that fuller details of some of these mosses were not given, as it appears from the descriptions that two of them do not belong to this genus, but to other genera. I have therefore not



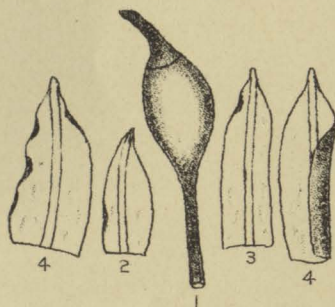
Pottia acaulis



Pottia alfredii

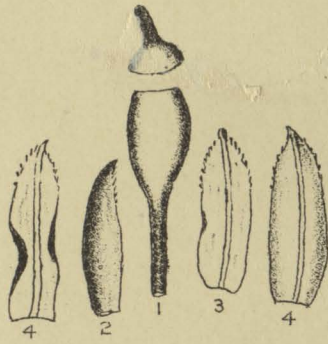


Pottia wrightii



Pottia sterensii

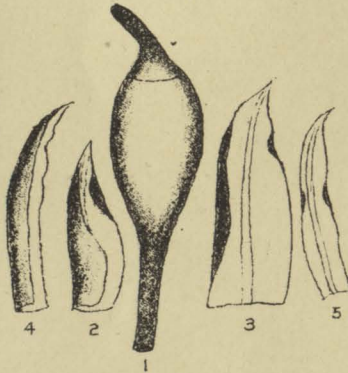
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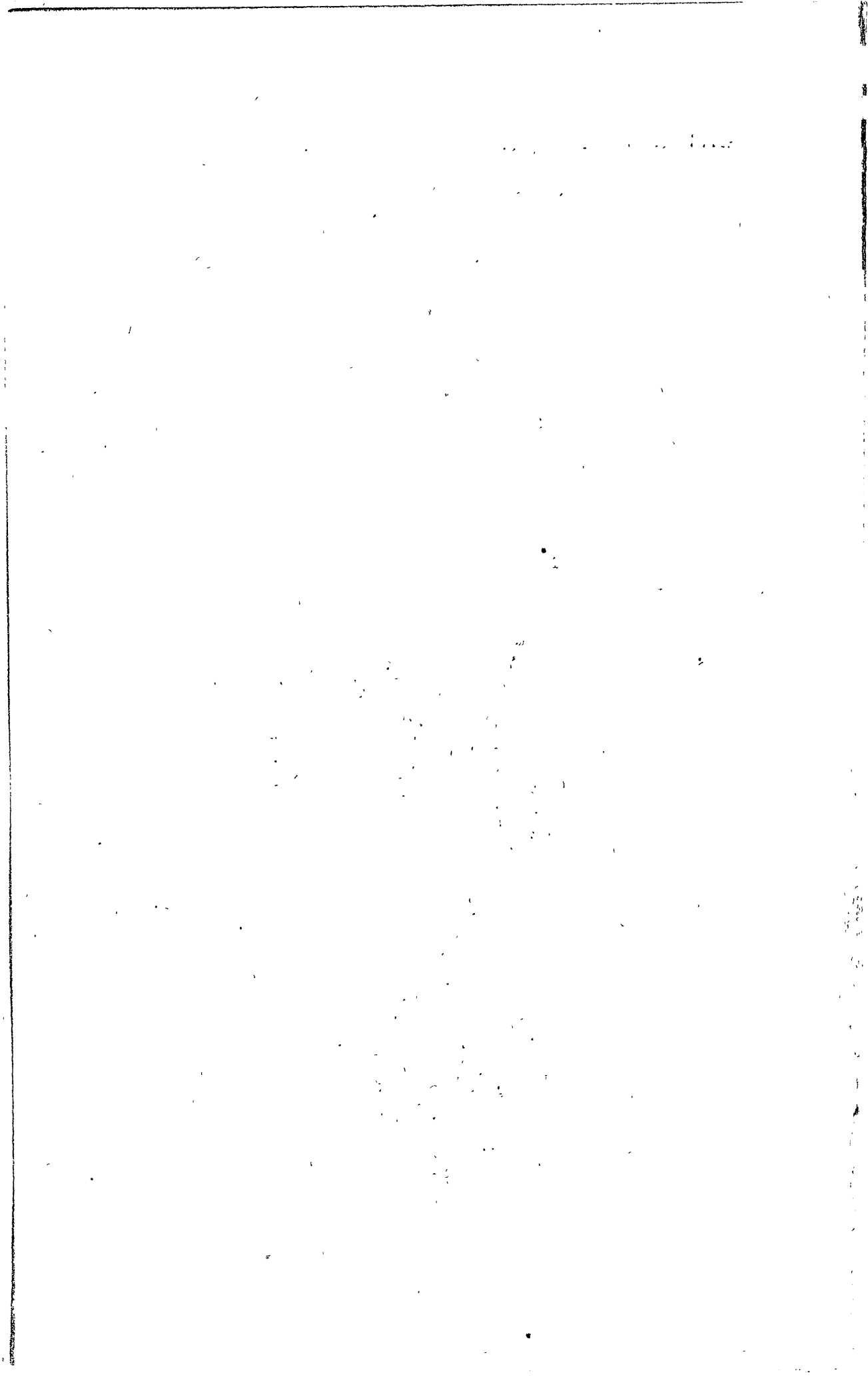
Pottia serrata

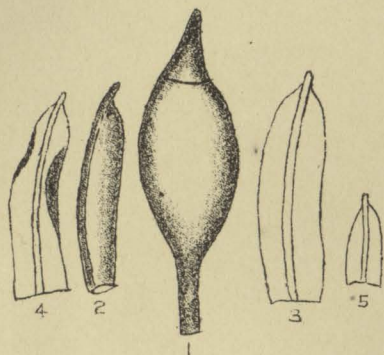


Pottia longifolia.

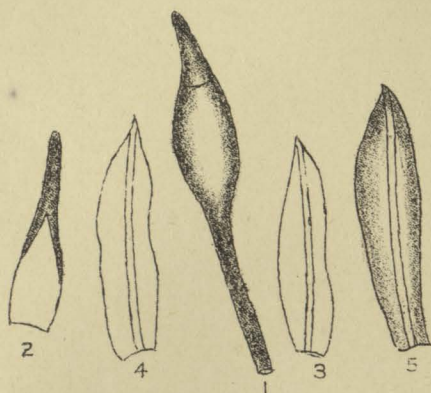


Pottia hickertonii

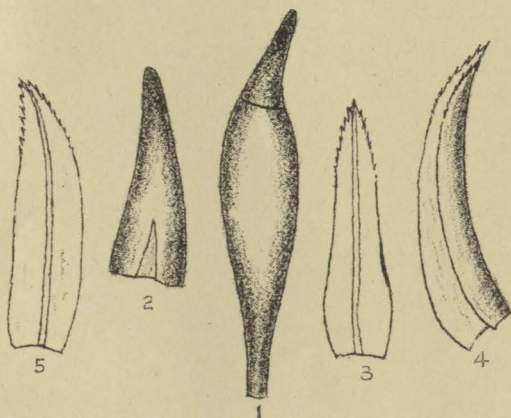




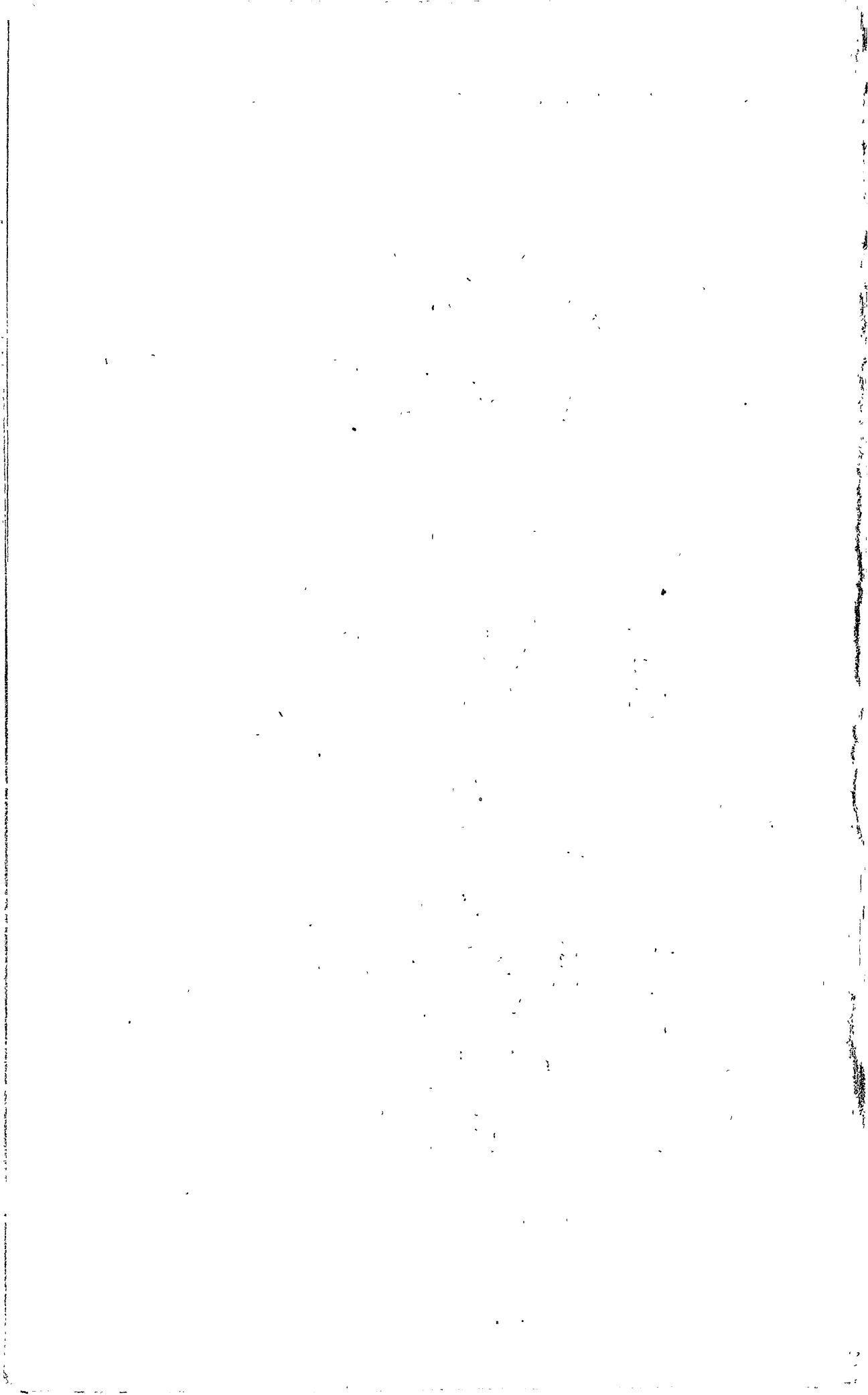
Pottia macrocarpa

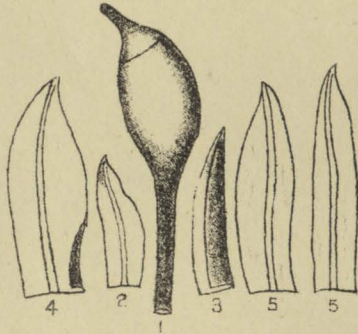


Pottia leonardi

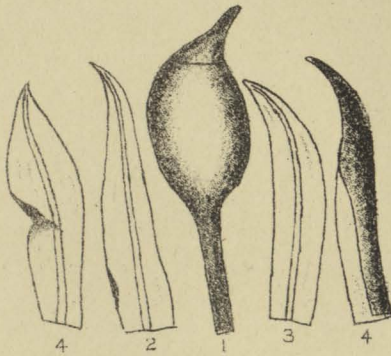


Pottia grata

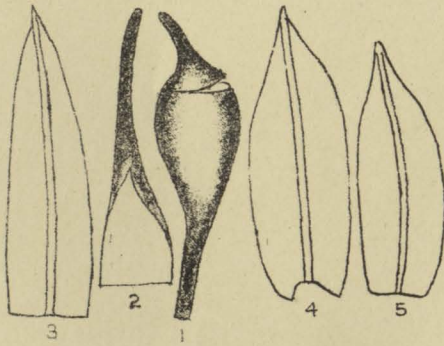




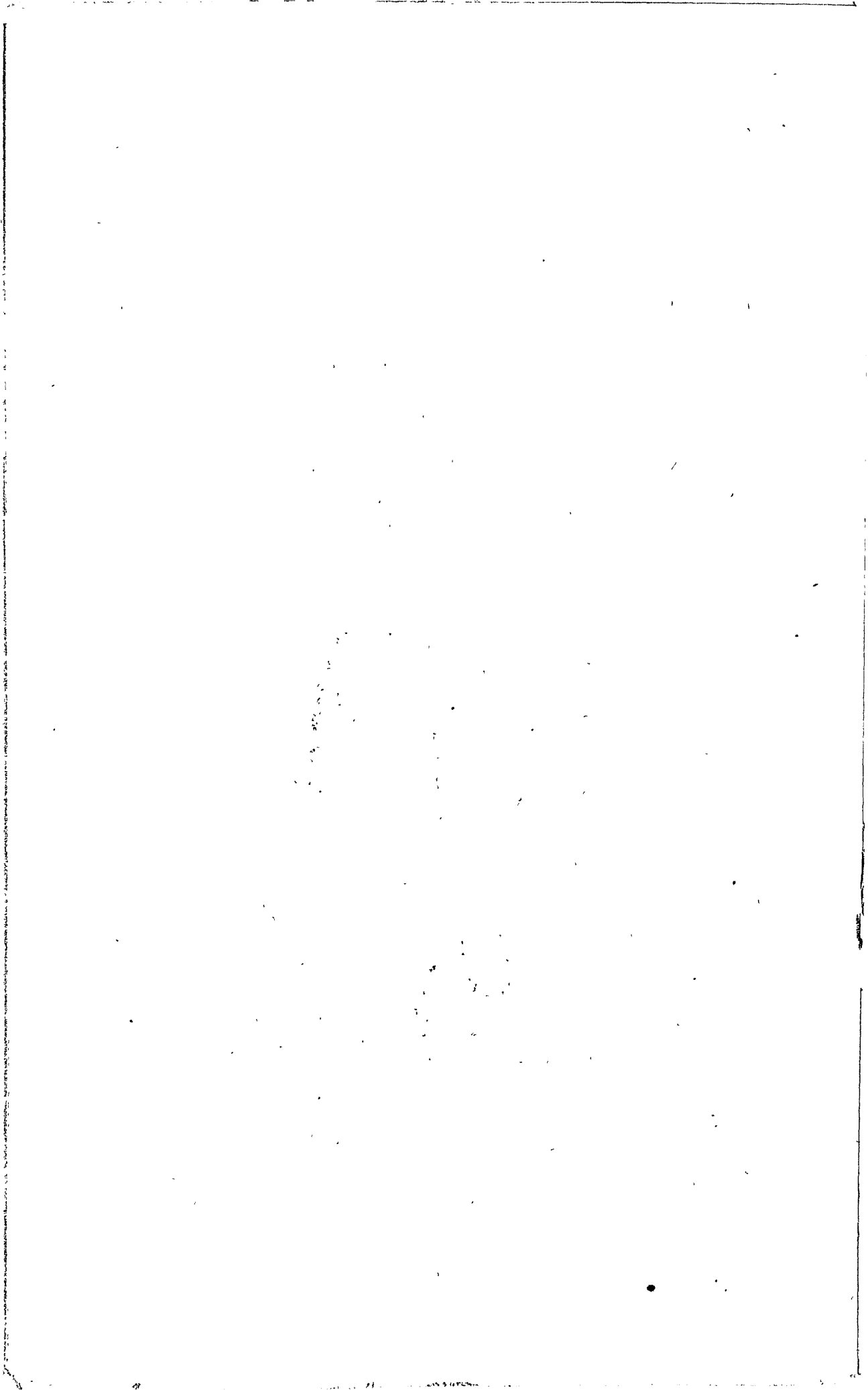
Pottia assimilis



Pottia obliqua



Pottia douglasii



included them in this paper, but have left them to be placed in their proper position hereafter.

There are but two species described in the Handbook—viz., *G. tortile* and *G. calcareum*.

G. tortile is distinguished from all the other New Zealand species yet found by the regular incurving of the margins of its leaves. It is also a native of Britain and other parts of Europe.

G. calcareum I have collected at Castle Hill on the West Coast Road, and also at the Weka Pass. It was found on wet banks, in dense, irregular pulvinate patches, often very large, fruiting sparingly. The plant I have identified as *G. calcareum* I have drawn on Pl. XXXV.

Mr. Knight describes five species of this genus in the paper before referred to—viz., *G. patulum*, *G. knightii*, *G. sulcatum*, *G. areolatum*, and *G. angustatum*. He also describes a variety of *G. calcareum* which he has named var. *intermedia*.

G. patulum.—There is a note attached to the description of a moss (*Weissia flavipes*) in Hooker's Handbook, p. 404, which states that Mr. Wilson, who examined the Auckland form of this moss very carefully, suggested that it was probably a different species from *W. flavipes*, on account of his finding no trace of a peristome, and proposed to name it *Gymnostomum patulum*. Mr. Knight does not mention whether it is this particular moss or another species which he has thus named (*G. patulum*). Knight's plant is described as having the mouth of the capsule closed by a membrane, and having crisp leaves. These two characters would make this plant a most distinct species; but in the figure representing the whole plant the fruitstalk is drawn twice the length of the leaves, while in the description it is described as no longer than the leaves. Also, in the enlarged drawing of a leaf (vol. vii., pl. xxviii., fig. c) it is drawn as if the margins of the leaf had a thickened border, or were either incurved or recurved, which is also not described, leaving it doubtful which is correct.

G. knightii is one of the most distinct species in this genus, and is readily identified. It grows in Hagley Park, in the Domain, and round the neighbourhood of Christchurch.

G. calcareum, var. *intermedium*.—In the enlarged figure of the leaf of this plant a thickened border is shown, which is not described. This is evidently a mistake, as *G. calcareum* has not a thickened margin.

G. sulcatum.—This plant occupies a rather anomalous position by being placed in the genus *Gymnostomum*, as the furrowed capsules of this moss point to the genus *Zygodon* as being the proper place for it, there being a gymnostomous section in that genus which has also sulcate capsules and

small cellular tissues. I have not seen this plant, but from its description am of the opinion that it belongs to the latter genus. A reference to the figure given also confirms my idea. I do not therefore propose to treat it as a *Gymnostomum*.

G. areolatum.—This moss is also in much the same position with regard to its genus as *G. sulcatum*. The large cellular tissue described as belonging to this plant, and the drawing thereof, show that it is a true member of the genus *Pottia*, which is composed of annual or biennial plants, having large cell-structure. I therefore propose to place this moss in the latter genus.

G. angustatum.—I was under the impression that I had discovered this moss, but on closely examining my specimens I found traces of sixteen teeth, and, although it corresponded in every respect with Mr. Knight's description of *G. angustatum*, with the exception of these teeth, it therefore could not possibly be the same moss.

The following is the proposed arrangement of the species of this genus as discovered to date:—

- | | |
|---|--|
| | <i>Gymnostomum calcareum</i> , Nees and Hornsch. |
| | <i>var. intermedia</i> , Knight. |
| " | <i>tortile</i> , Schwægrichen. |
| " | <i>patulum</i> , Knight. |
| " | <i>knightii</i> , Schimper. |
| " | <i>angustatum</i> , Knight. |
| " | <i>pygmæum</i> , <i>nov. sp.</i> |
| " | <i>ligulatum</i> , <i>nov. sp.</i> |
| " | <i>waimakaririense</i> , <i>nov. sp.</i> |
| " | <i>magnocarpum</i> , <i>nov. sp.</i> |
| " | <i>stevensii</i> , <i>nov. sp.</i> |
| " | <i>longirostrum</i> , <i>nov. sp.</i> |
| " | <i>wrightii</i> , <i>nov. sp.</i> |
| " | <i>var. A.</i> |

***Gymnostomum pygmæum*, nov. sp. Plate XXXV.**

Plants very small, perennial, growing in dense patches. *Stem* extremely short, branched. *Branches* fastigiate, $\frac{1}{3}$ in. long. *Leaves* minute, erecto-patent or erect, linear-lanceolate, acuminate. *Margins* entire. *Nerve* faint, disappearing below the apex. *Lower areola* oblong, quadrate; *upper* small, crisped when dry. *Perichætical* leaves half as long as the upper-stem leaves, erect, entire, otherwise similar to the stem-leaves. *Fruitstalk* inclined, $\frac{3}{16}$ in. high. *Capsule* ovate, symmetrical. *Mouth* narrowed. *Peristome* none. *Operculum* oblique, conico-rostrate, two-thirds length of capsule. *Calyptra* cucullate.

Hab. Damp limestone rocks, near Castle Hill. Collected March, 1891, by R. B.

***Gymnostomum ligulatum*, nov. sp. Plate XXXV.**

Plants small, perennial, growing in dense patches, darkish-green. *Stem* short, $\frac{1}{8}$ in., branched. *Branches* fastigiate, $\frac{1}{8}$ in. *Leaves* crowded, spreading, or erecto-patent, ligulate rounded at the apex, apiculate by the excurrent nerve, keeled. *Margins* entire. *Nerve* same colour as the leaf, excurrent. *Perichæatial* leaves much smaller than stem ones, otherwise very similar. *Fruitstalk* slightly longer than the leaves. *Capsule* large, ovate, subsymmetrical. *Operculum* oblique, conic, tapering to the point, two-thirds the length of the capsule. *Calyptra* not found.

Hab. Port Lyttelton Hills, on damp banks, fruiting from November to January. Collected, 1882, by R. B.

This plant differs from *G. patulum*, Knight, principally in the mouth not being closed by a membrane, and in the perichæatial leaves being shorter than the stem ones.

***Gymnostomum waimakaririense*, nov. sp. Plate XXXVI.**

Plants small, perennial, growing in dense patches. *Stem* $\frac{3}{16}$ in., branched. *Branches* fastigiate, $\frac{1}{8}$ in. *Leaves* close-set, erecto-patent. *Upper* leaves recurving, lanceolate, sharply acuminate, semi-convolute, keeled. *Margins* entire. *Nerve* excurrent. *Upper areola* dense, *lower* oblong-quadrate. *Perichæatial* leaves one-third longer than stem ones, linear-lanceolate, very acuminate, tapering from a broad base. *Nerve* excurrent. *Fruitstalk* $\frac{1}{8}$ in. long, shorter than the perichæatial leaves. *Capsule* subimmersed, ovate, symmetrical. *Operculum* conico-rostrate, more than half the length of the capsule. *Calyptra* cucullate.

Hab. Damp ground, among willows, at the River Waimakariri. Collected, September, 1885, by R. B.

***Gymnostomum stevensii*, nov. sp. Plate XXXVI.**

Plants small, perennial, growing in dense patches. *Stem* very short, branched. *Branches* fastigiate, $\frac{1}{8}$ in. long. *Leaves* closely crowded, spreading, or erecto-patent, linear-lanceolate or acuminate, semi-convolute, slightly cucullate, and incurved at the apex, keeled. *Margins* entire, sometimes slightly incurved. *Nerve* excurrent, almost apiculate. *Upper areola* dense, *lower* oblong-quadrate, crisped when dry. *Perichæatial* leaves very long, linear-lanceolate, acuminate, nerved. *Fruitstalk* pale, $\frac{5}{8}$ in. long. *Capsule* large, oval. *Operculum* oblique, short, conico-rostrate. *Calyptra* not found.

Hab. Damp banks, Port Lyttelton Hills. Collected in 1882, by R. B.

This plant is conspicuous, and easily distinguished by its large capsule and long perichæatial leaves. I have named

it in compliment to a member of the Institute, Joseph Stevens, Esq., of Christchurch.

Gymnostomum magnocarpum, nov. sp. Plate XXXVI.

Plants small, perennial, growing in dense, olive-green patches. *Stem* $\frac{3}{16}$ in., branched. *Branches* fastigate, $\frac{1}{8}$ in. *Leaves* closely imbricating, spreading, or erecto-patent, slightly recurving, oblong-lanceolate, acuminate, occasionally rounded to an apiculus, concave. *Margins* entire, sometimes slightly incurved. *Nerve* excurrent. *Areola*, upper dense, lower oblong-quadrate, crisped when dry. *Perichætil* leaves shorter than the stem ones, narrow, lanceolate from a broader base, acuminate. *Nerve* excurrent. *Fruitstalk* $\frac{3}{8}$ in., pale, inclined. *Capsule* ovate-symmetrical. *Operculum* convexo-rostrate, about two-thirds length of capsule. *Calyptra* cucullate.

Hab. Damp banks, Governor's Bay. Collected, August, 1881, by R. B.

Gymnostomum longirostrum, nov. sp. Plate XXXVII.

Plants small, perennial, growing in dense yellowish-green patches. *Stem* short, $\frac{1}{16}$ in., branched. *Branches* fastigate. *Leaves* crowded, erecto-patent, linear-lanceolate, acuminate or apiculate, concave, keeled. *Margins* entire. *Nerve* pellucid, continuous or excurrent. *Areola*, lower half oblong-quadrate, upper dense, crisped when dry. *Perichætil* about the same length as the upper leaves, nearly erect. *Fruitstalk* pale, slender, inclined, $\frac{1}{4}$ in. long. *Capsule* ovate, unsymmetrical, narrowed towards the mouth. *Operculum* oblique, slender, conico-rostrate, as long as the capsule, sometimes longer. *Calyptra* long, cucullate.

Hab. Damp banks, on Port Lyttelton Hills, 1873; and in the Valley of the Clinton, 1889; fruiting from December to February. Collected by R. B.

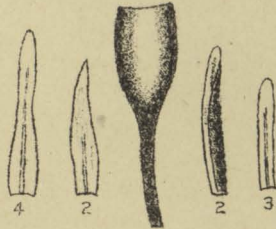
Gymnostomum wrightii, nov. sp. Plate XXXVII.

Plants small, perennial, growing in dense patches. *Stems* $\frac{1}{8}$ in., branched. *Branches* $\frac{1}{8}$ in., fastigate. *Leaves* ovate-lanceolate, obtuse or acute, apiculate, concave. *Margins* entire. *Nerve* excurrent. *Areola*, upper dense, lower oblong-quadrate, crisped when dry. *Perichætil* leaves longer than the stem ones, linear-lanceolate, acuminate. *Nerve* excurrent. *Fruitstalk* $\frac{1}{8}$ in. long, no longer than the leaves. *Capsule* very oblique. *Operculum* oblique, conico-rostrate, about two-thirds length of capsule. *Calyptra* cucullate.

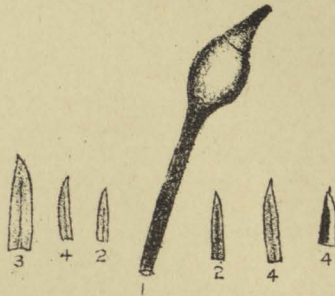
Hab. Damp banks, Broken River, West Coast Road, 1891.

Var. A.

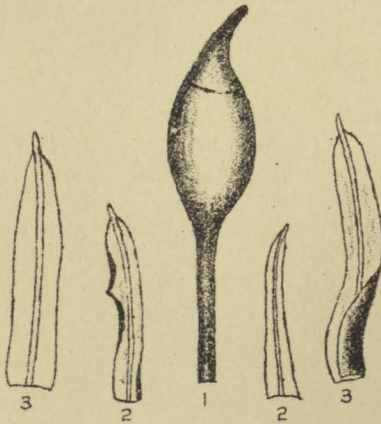
A variety near the River Heathcote, collected by R. B. in 1882. Has a stouter operculum and the leaves longer.



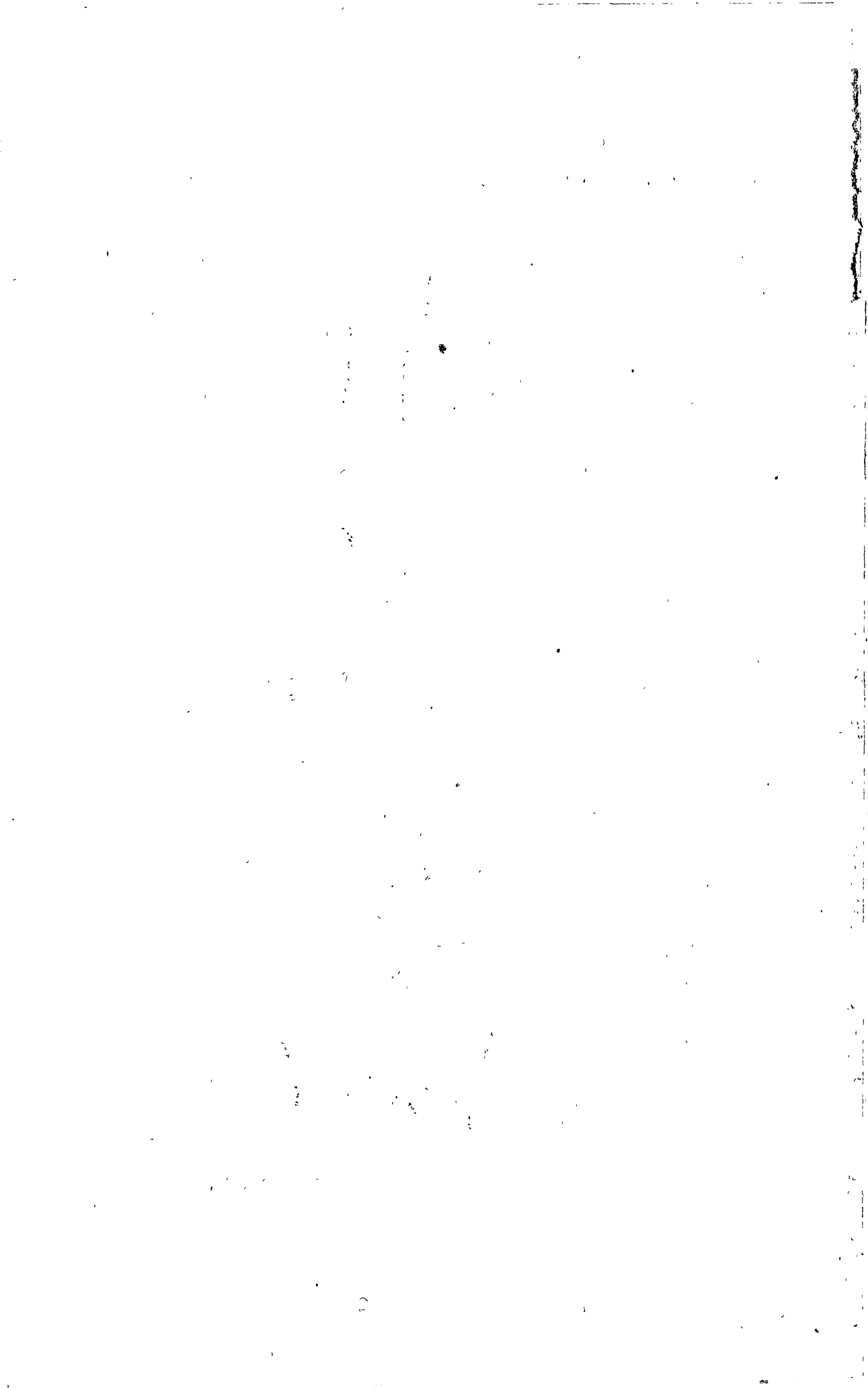
Gymnostomum calcareum

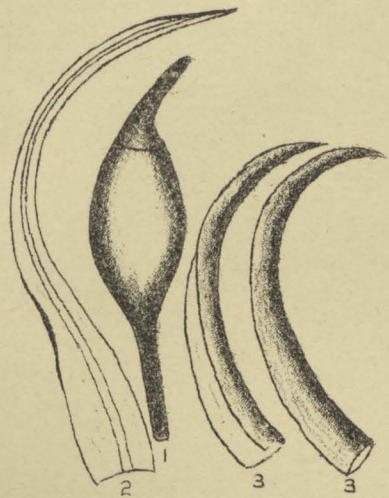


Gymnostomum pygmaeum

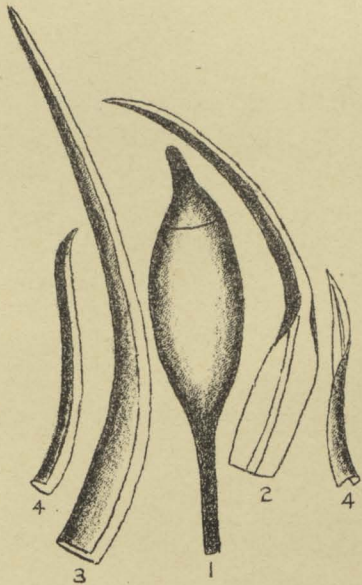


Gymnostomum ligulatum

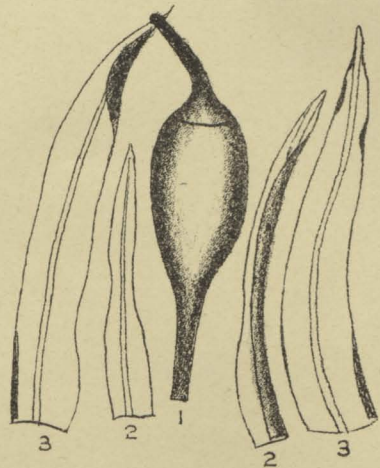




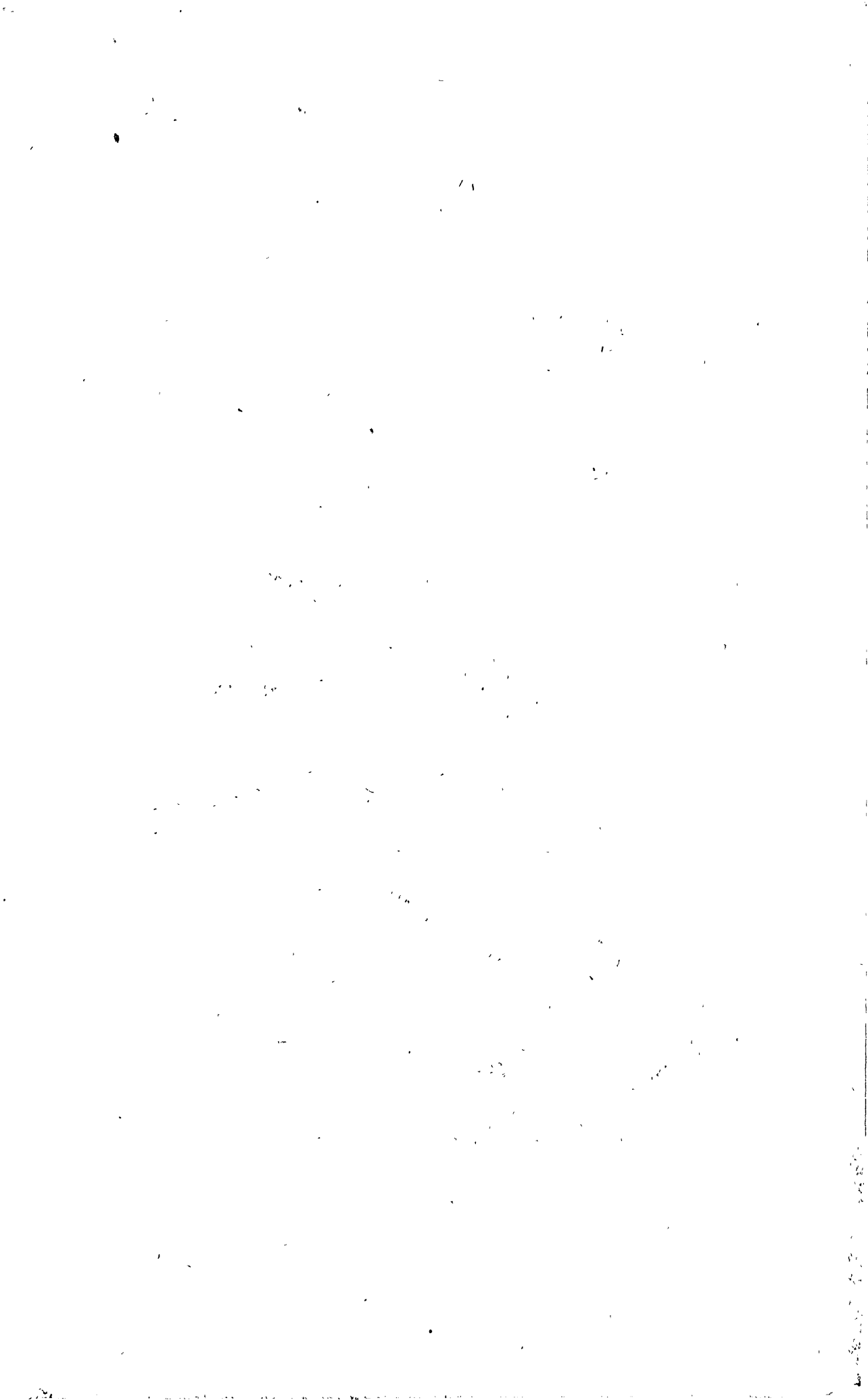
Gymnostomum waimakaririense

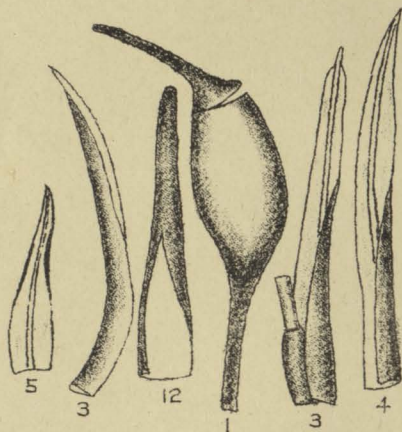


Gymnostomum magno-carpum

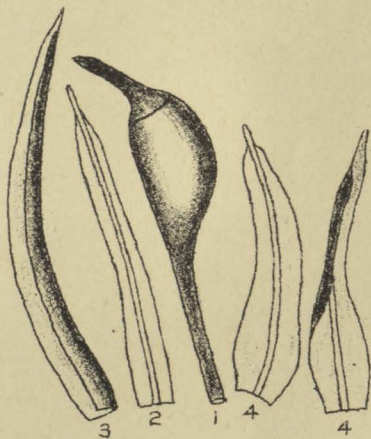


Gymnostomum stevensii



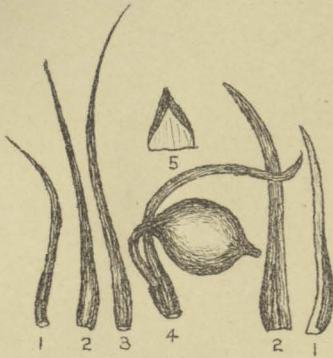


Gymnostomum longirostrum

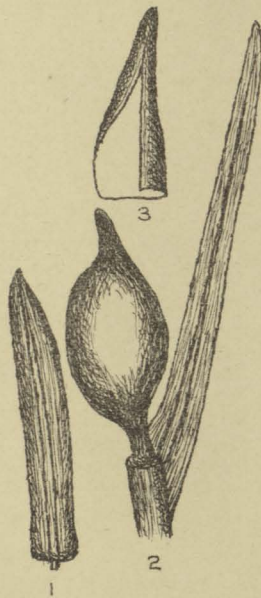


Gymnostomum wrightii

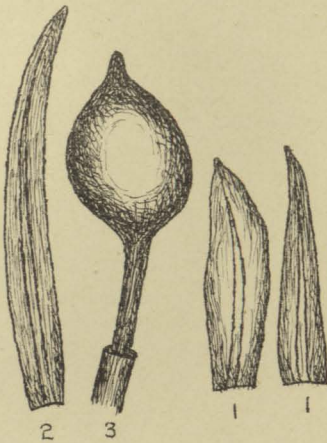




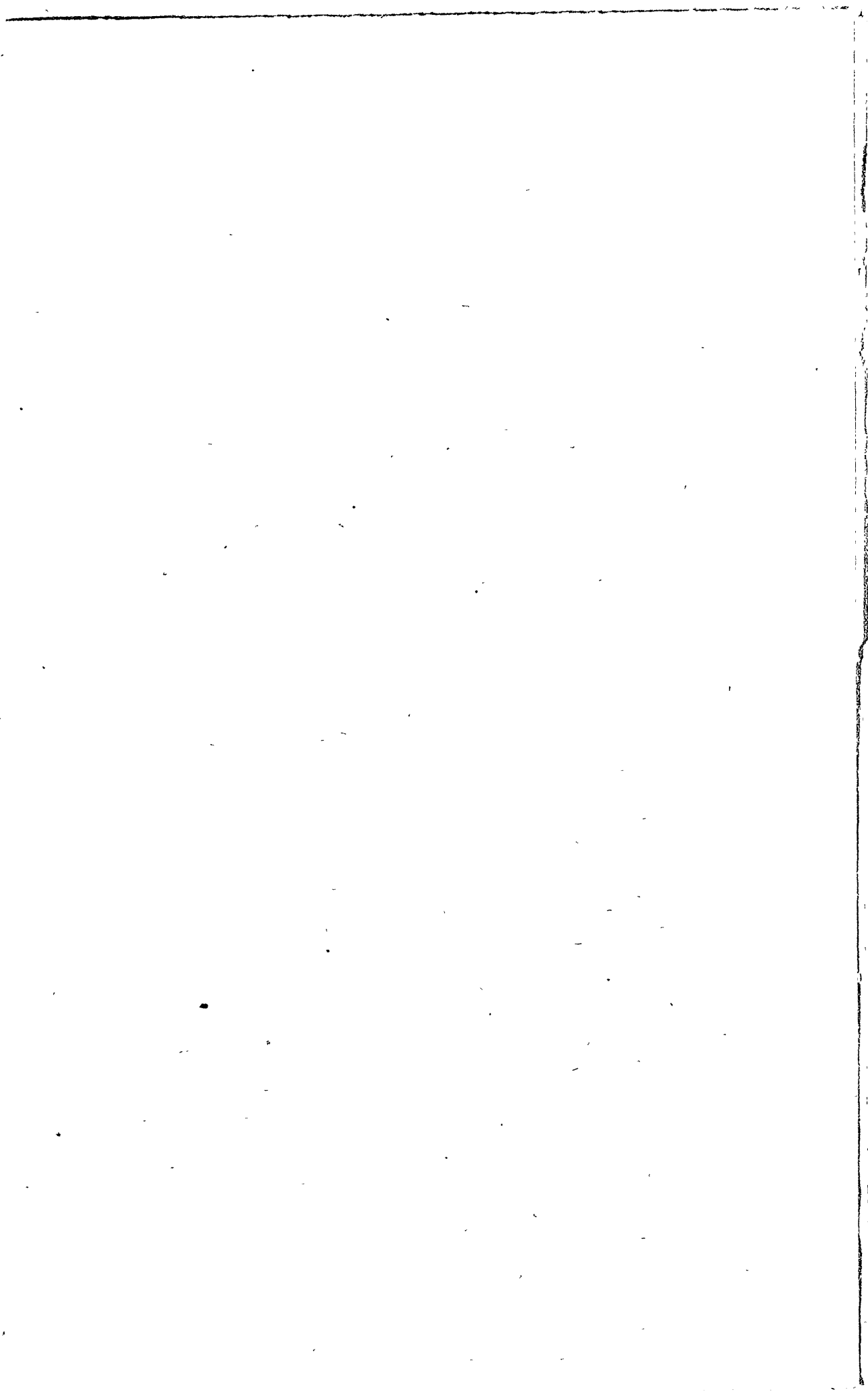
Phascum (Cycnea) arnoldii.



Phascum (Pleuridum) longifolium.



Phascum (Pleuridum) lanceolatum.



(All the figures of these mosses, as well as my previous contributions in this direction, are drawn with the assistance of a camera lucida to one scale, for the purpose of greater facility of comparison.)

EXPLANATION OF PLATES XXXV.—XXXVII.

PLATE XXXV.

Gymnostomum calcareum.

Fig.

1. Capsule.
2. Perichæatial leaves.
3. Stem leaf (lower).
4. Stem leaf (upper).

Gymnostomum pygmæum.

1. Capsule.
2. Perichæatial leaves.
3. Upper stem leaf.
4. Stem leaves.

Gymnostomum ligulatum.

1. Capsule.
2. Perichæatial leaves.
3. Stem leaves.

PLATE XXXVI.

Gymnostomum waimakaririense.

Fig.

1. Capsule.
2. Perichæatial leaf.
3. Stem leaves.

Gymnostomum stevensii.

1. Capsule.
2. Perichæatial leaves.
3. Stem leaves (upper).

Gymnostomum magnocarpum.

1. Capsule.
2. Perichæatial leaf (inner).
3. Perichæatial leaf (outer).
4. Stem leaves.

PLATE XXXVII.

Gymnostomum longirostrum.

Fig.

1. Capsule.
2. Calyptra.
3. Perichæatial leaves.
4. Stem leaf (upper).
5. Stem leaf (lower).

Gymnostomum wrightii.

1. Capsule.
2. Perichæatial leaf (inner).
3. Perichæatial leaf (outer).
4. Stem leaves.