



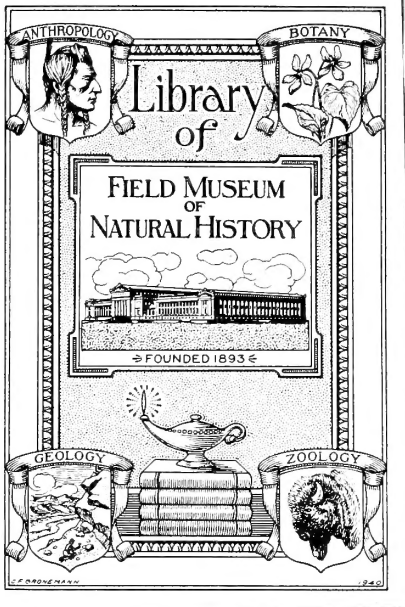
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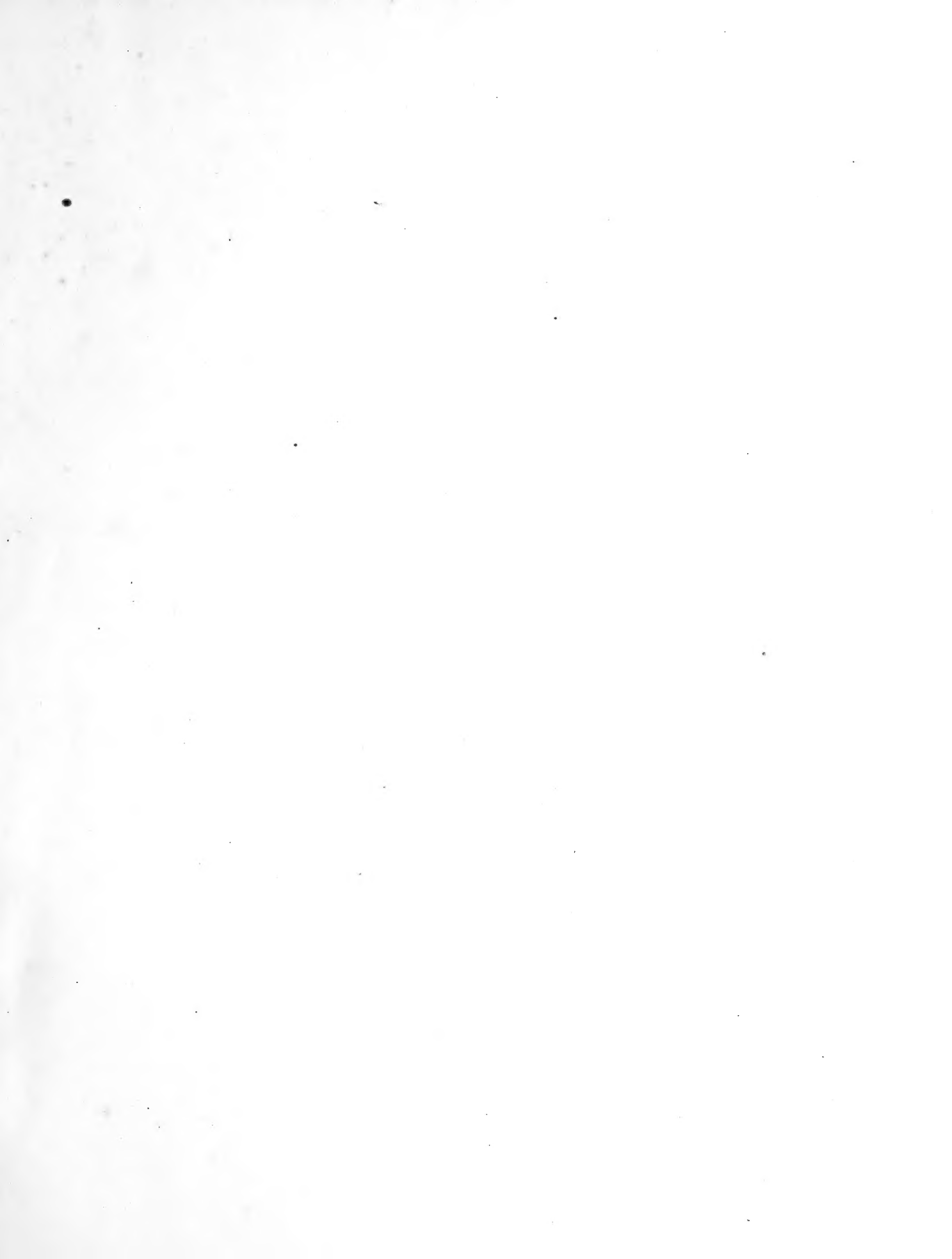


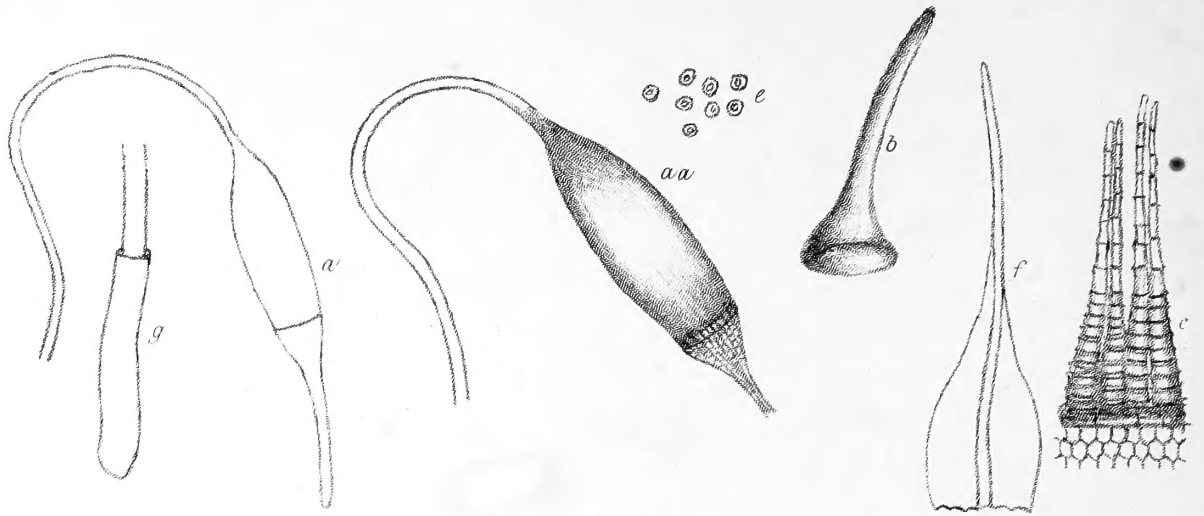
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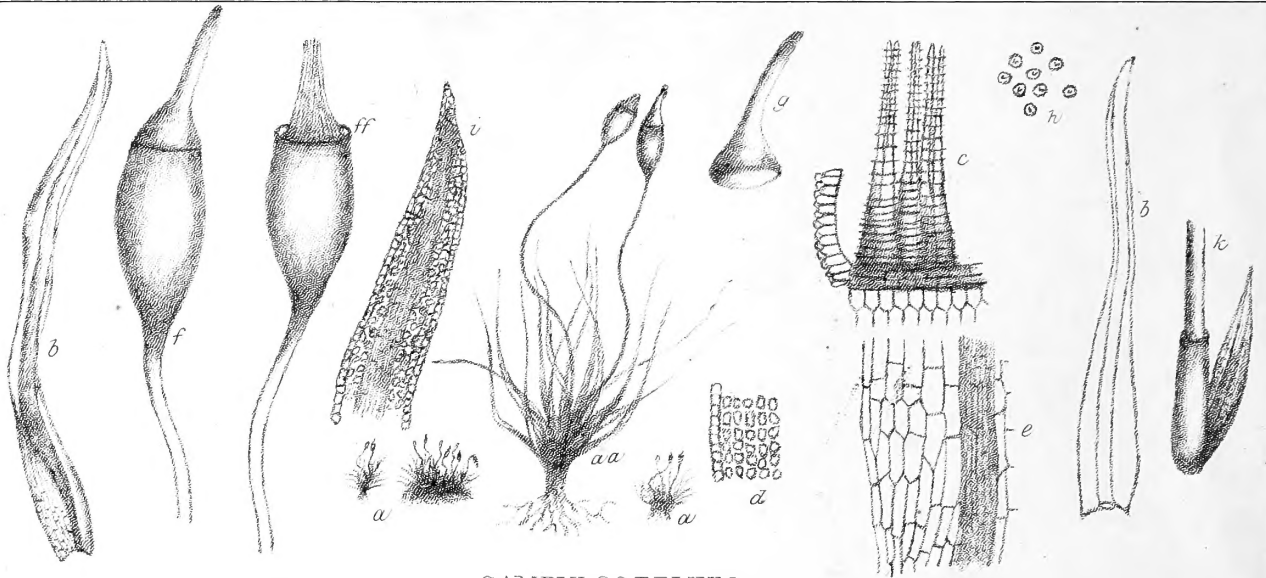
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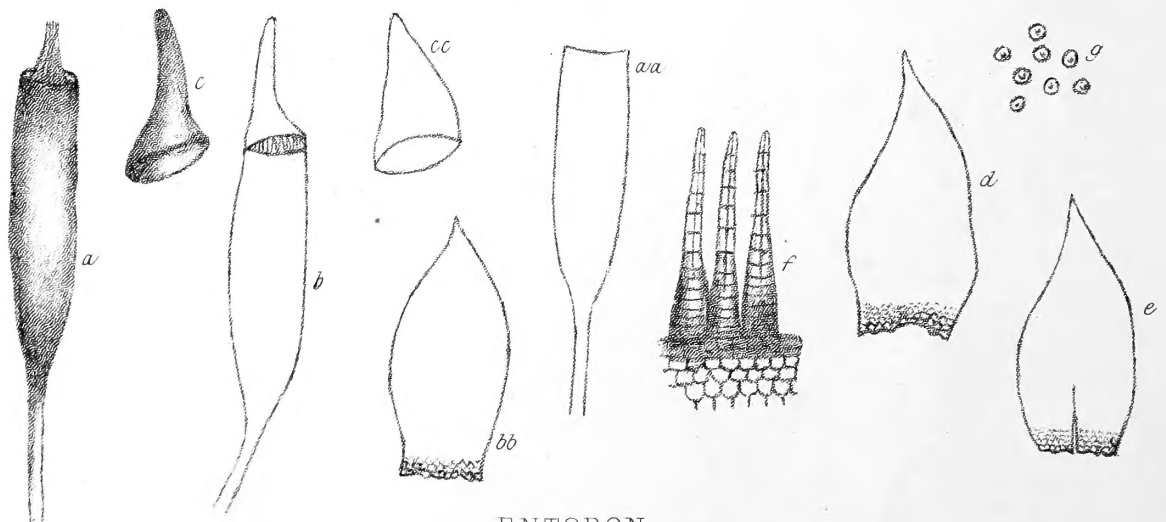




DICRANODONTIUM.



CAMPYLOSTELIUM



ENTODON.
(*Cylindrothecium*.)

DONALD RICHARDS
Department of Botany
Chicago Natural History Museum

1946



ILLUSTRATIONS AND DISSECTIONS

OF

The Genera of British Mosses.

BY

W. C. UNWIN.



Lewes:

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P R E F A C E .

The following drawings of dissections of British Mosses are put forth as a small effort to aid the study of this interesting family of plants.

A fully illustrated work on Mosses must necessarily be very expensive, if carried out on the plan which I have adopted, for there are 568 recognised species.

An attempt has been made to render the work more useful than it would have been in its first form ; and it is hoped that, with the illustrations given of the Genera, the student will be enabled to make out, at least, the genus of any Moss which he may find, and thus the subject will be divested of some of its difficulties.

In all cases the most prominent generic features have been studied, so that every assistance might be given to those who desire to work in this branch of Cryptogamic Botany.

The additional plate (XXII.) gives the outlines of the capsules, leaves, and cell formation of the leaf of the Sub-genera of Hypnum, as described in "Hobkirk's Synopsis," pp. 145-182.

In the general arrangement of the Genera, I have adopted that given in "Hobkirk's Synopsis" and Wilson's "Bryologia Britannica," the two most available works on British Mosses.

Since the preparation and publication of the greater portion of this volume, a Catalogue of British Mosses has been issued by C. P. Hobkirk and H. Boswell, differing greatly in its arrangement and nomenclature from that followed in this volume.

I had contemplated adding an analytical and synoptical table of the Genera, but found it would have extended the work beyond its limit. The student can find these in the books alluded to.

I have to acknowledge my thanks to many gentlemen who have kindly assisted me in my work. If I omit some names, I trust I may be forgiven ; but among those whom I would especially mention is the Rev. R. Blight, of Lewes, who has, from time to time, revised these sheets ; and, but for his kindness, the work would have been abandoned. I must also add that I am indebted very deeply to Dr. R. Braithwaite, F.L.S., F.R.M.S., etc., of Clapham Rise, Surrey ; Mr. W. Mitten, of Hurstpierpoint ; Mr. S. A. Stewart, F.B.S.E., of Belfast ; Mr. C. P. Hobkirk, of Huddersfield ; Mr. James Hardy, of Oldcambus, N.B. ; and Mr. Henry Knight, of Weston-Super-Mare.

To the Subscribers who have cheerfully and willingly given their support to my undertaking, I must express my gratitude.

W. C. U.

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HINTS ON THE COLLECTING, &c., &c., OF MOSSES.

There is always an advantage in a young student adopting and adhering to one branch of study, and it shall be my endeavour to place before him, to the best of my ability, the way of collecting, preserving, and arranging Mosses. In this branch of Botany there are one or two advantages over the study of Phanerogamia, or flowering plants, especially to those whose time is greatly occupied during the day.

Firstly.—Every month produces some species which may be gathered. Secondly.—The specimens collected may be kept for months, nay, even for years, and after having been dried will immediately revive on being soaked in water in a small saucer for a short time.

Much has been written on the subject of collecting, preserving, &c., of plants generally, and every Botanist has his own favourite method. I would, however, briefly state my own experience, and, for the convenience of the student, the subject may be divided into the following sections :—

1st.—Habitats.

2nd.—The apparatus necessary for collecting, observation, preserving, &c.

3rd.—The season for collecting.

4th.—How to set to work at examination, dissecting, mounting, &c.

I. Habitats.—This family of plants is to be found everywhere. On old walls, the roofs of tiled and thatched buildings, on our garden walks, by the road side, on hedge banks, on our Downs and commons, in fallow fields, on loose chalk stones and sandstones, on the roots, trunks and branches of trees, on low shrubs, on the rugged faces of chalk cliffs, on the shingle by the sea shore, in streams and ditches, and in many a place where the sun hardly or never penetrates. In bogs, on the mountain top where scarcely any other plant can find sustenance, many rare and beautiful species are met with. In fact we may almost call the Moss the pioneer of vegetable life. There are few spots which will not afford an ample supply of specimens for hours of study, from the sea shore to the mountain ridge.

II. The Apparatus Necessary for Collecting, &c.—The apparatus necessary for collecting, observing, &c., is very simple and inexpensive.

The only really necessary articles are :—

1.—An old pocket knife.

2.—An ordinary pocket lens with two or three powers.

3.—A common satchel or small leather bag, such as can be strapped over the shoulder.

4.—A good supply of square pieces of paper to wrap each species in (ordinary envelopes will do). Care should be taken to note the locality, habitat, and date on the outside, at the time each is collected.

5.—A few dozens of glass slides, 3in. × 1in., with some circular or square thin glass covers, and a small piece of cork, about 2in. square.

6.—A pair of steel forceps ; two dissecting needles which can be made as suggested by the Rev. J. G. Wood : “ I invariably employ common camel’s hair brush handles, in which the needles can be readily fastened. Get a convenient handle, and wrap about a third of an inch with waxed thread, leaving a little of the wood projecting without any thread. Take the needle and break it off to a convenient length, push the point into the handle so as to make a hole, reverse it, and with a pair of pliers drive the needle well into the handle. Now trim the wood to a point.” Rub the needle on a hone, and an edge is soon obtained.

After having gathered the specimen, the earth and moisture should be as much as possible carefully removed, on the spot. On reaching home, the packets should be opened and laid out to dry, and if the plants

are required for the Herbarium, each should be carefully placed between three or four sheets of porous paper (Bentall's Botanical drying paper is the best) and subjected to gentle pressure. The paper should be changed daily, until the specimen is thoroughly dry. It is then fit for mounting, a process which must be left to the taste of the student.

The following method I have myself used with success. When the Mosses are quite dry, I place each species in a small pocket or envelope, and write the name, locality, habitat, and date of gathering on the outside. The pocket containing each species is then gummed along the top edge on a quarto sheet of toned paper, and those of each Genus are placed in a wrapper of thick, coloured cartridge paper; and the name of the Genus is written on the left hand lower corner of the wrapper.

III. The Season for Collecting.—This cannot be better described than "all the year round." It need scarcely be said that a specimen of a Moss is not complete without the fruit. Many species are to be met with at all times, but the majority have their special seasons, and no period of the year is without its representative.

The student will therefore do well to pursue his investigations throughout the year. In winter and early spring Mosses are in the greatest perfection, probably from there being the greatest amount of moisture at those times. Some few Genera produce their fructification in the autumn and winter months, then die off, and are seen no more until another generation appears in the following season.

IV. How to Set to Work at Examination, &c.—A beginner should dissect some large specimen, such as *Polytrichum commune*, *Hypnum rutabulum* or *Funaria hygrometrica*, noting all the characteristics from the root upwards, following the type given him in the descriptions in this work. The best and safest method of observing the plainer differences is to examine the plants under a common lens, supported on a stand, or better still, under a compound microscope with a 2in. objective.

The dissection should commence with the stem, by making a horizontal and vertical section. This will show the cellular formation. Next the branches should be examined with regard to their position and connection with the stem. Then the leaves must be detached. This operation is best performed by holding the branch or stem in the left hand with the forceps, and stripping the leaves off, backwards and downwards, with the help of the dissecting needle. Great attention should be paid to this part of the examination of the plant, as generally the stem leaves, branch leaves, and perichætal leaves present different forms in outline and cellular character.

The organs of Inflorescence must then be sought for, and it should be particularly noted whether they are terminal or axillary.

Then follows the examination of the *Capsule* or urn, as to position, structure, and shape. Afterwards the *Calyptra* or veil must be removed, and its shape and structure carefully noted. This must also be done with regard to the *Operculum* or lid. Lastly, in order to obtain a clear view of the *Peristome* or toothed fringe round the mouth, and *Annulus* or ring round the inner portion of the mouth of the Capsule, I have found the easiest method is to fasten the Capsule, with a very fine entomological pin, on a piece of cork covered with white paper, then to cut it transversely immediately below the mouth with a sharp scalpel or dissecting needle, and to wash it well in a little water with a fine camel's hair brush, to get rid of the spores which oftentimes attach themselves to the teeth. When this is done it may be transferred to a glass slide with a drop of water, putting on a thin glass circle or square. The remaining portion of the Capsule may be placed on another glass slide, and the spores pressed out with a dissecting needle, so that their shape and colour may be seen.

With these few hints, and with the help of the Plates of the Genera, the student will, it is hoped, find but little difficulty in discovering, at least, the Genus to which his specimen belongs.



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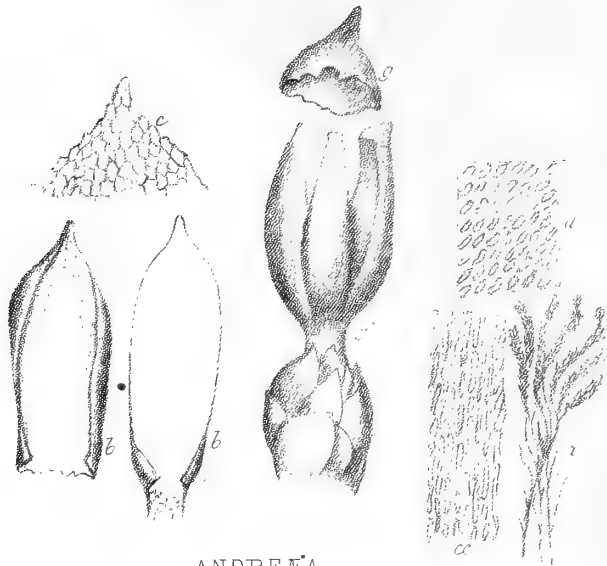
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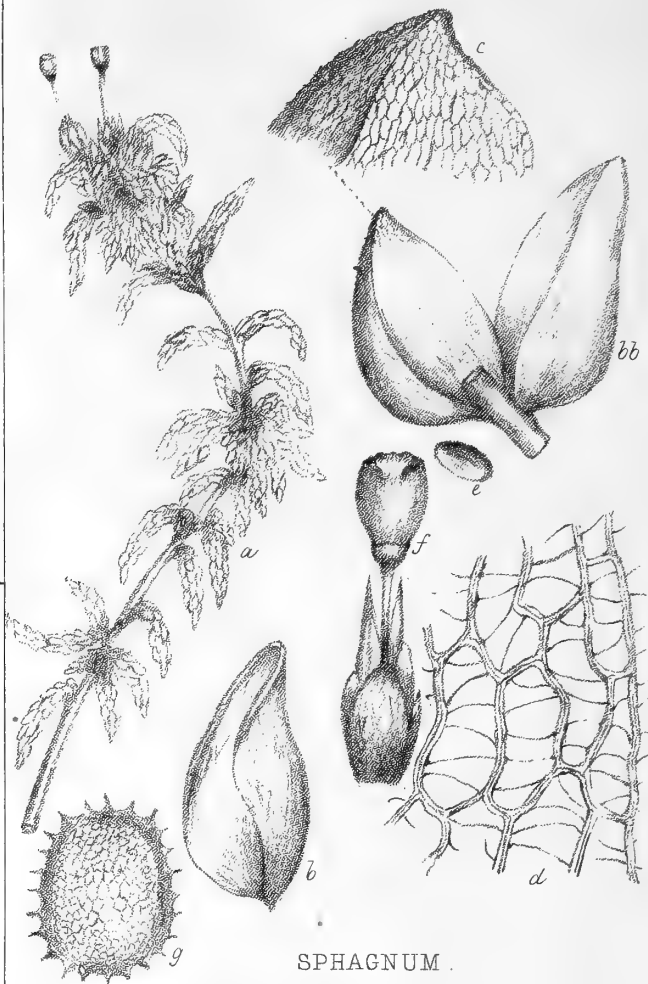
TO GENERA AND SPECIES.

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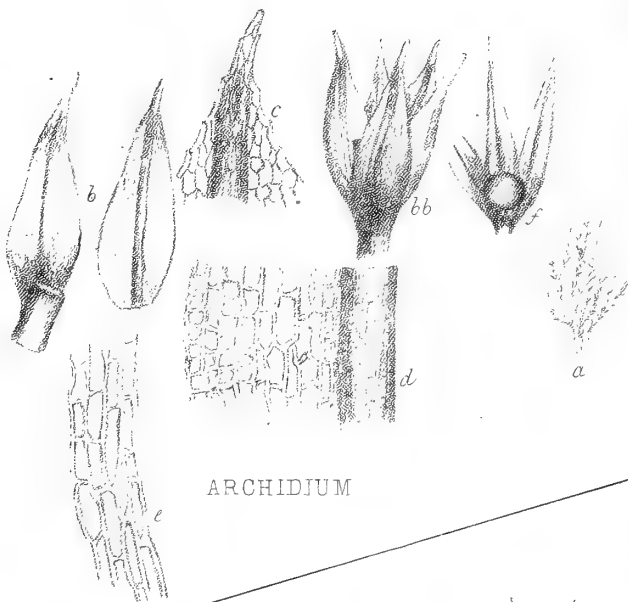




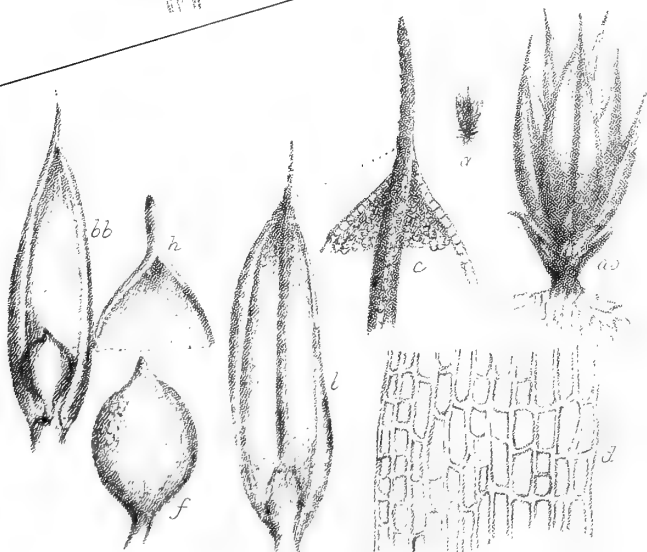
ANDREAEA



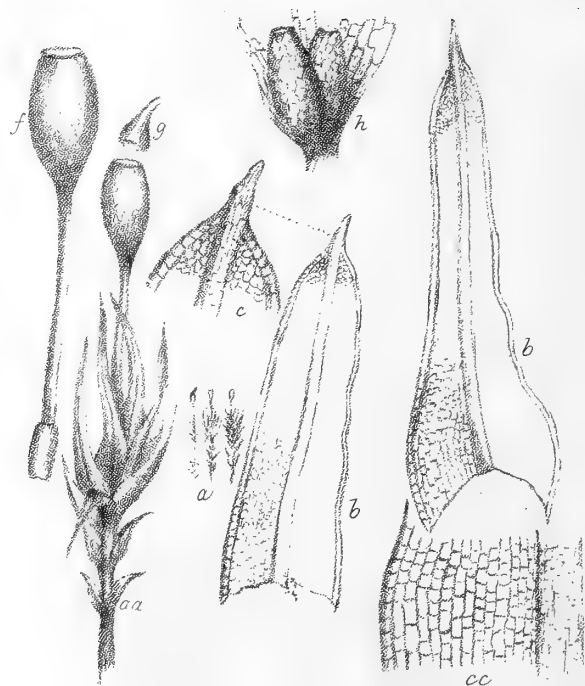
SPHAGNUM.



ARCHIDIUM



PHASCUM.



GYMNOSTOMUM.

1. GENUS ANDREÆA, Ehr.

WHOLE PLANT—Perennial, erect, rigid, $\frac{3}{4}$ to 1 inch in height; very like a *Jungermannia*.

STEM—Tall, tufted or cæspitose, branches of an equal length.

LEAVES—Imbricated, concave, ovate, lanceolate, entire, nerve absent in some species, but present in others; areolæ dot-like, apical cellules hexagonal, those of the mid-leaf ovate, basal cells elongated, colour dark purplish brown; perichæatial leaves convolute.

INFLORESCENCE—Both monoicous, and dioicous.

Barren Flower (ANTHERIDIA)—Oval, few.

Fertile Flower (ARCHEGONIA)—Few.

Capsule—Opening by 4 segments, cohering at the summit; erect on a stalked receptacle.

Calyptra—Mitriform, thin, irregularly torn.

Operculum—Persistent, adhering to the capsule.

Annulus—None.

Peristome—Wanting.

Spores—Small.

GENERAL HABITAT—Alpine situations. Fruit:—Summer.

SPECIES ILLUSTRATED—*Andreæa Alpina*. (Dill., Linn.).

Reference to Plate—*a*, Natural size of plant; *b*, Leaves, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *cc*, Basal cells, $\times 1$ -in.; *d*, Mid-leaf cells, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Calyptra, $\times 2$ -in.

• This genus is represented in Britain by nine species, according to Hobkirk, all affecting alpine situations, four being nerveless, five having the nerve present.

2. GENUS SPHAGNUM, Dill.

WHOLE PLANT—Large, aquatic, perennial, in dense patches, colour usually white, sometimes green or reddish, from 3 or 4 to 12 inches in height.

STEM—Robust, erect, simple or forked, woody with large membranous cells; branches spreading.

LEAVES—Erect, concave, more or less obtuse, ovate, elliptical, nerveless, beautifully reticulated, cellules lined with spiral filaments and minute pores, very similar to network, filled more or less with chlorophyll.

INFLORESCENCE—Dioicous.

Barren flower (ANTHERIDIA)—Roundish, pedicellate.

Fertile flower (ARCHEGONIA)—Sessile in the axis of a fascicle, presenting the appearance of a lateral branch.

Capsule—Globular.

Calyptra—Persistent, surrounding the ripe capsule.

Operculum—Flattish.

Peristome—None.

Spores—Small.

GENERAL HABITAT—Common in bogs, on heaths, and in marshes. Fruit:—July.

SPECIES ILLUSTRATED—*Sphagnum cymbifolium*, (Dill., Ehr.).

Reference to Plate—*a*, Plant natural size; *b*, Stem leaf, $\times 2$ -in.; *bb*, Leaves and portion of stem $\times 2$ -in.; *c*, Apex of leaf, $\times 1$ -in.; *d*, Cells of leaf, $\times \frac{1}{4}$ -in.; *e*, Operculum, $\times 2$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Horizontal section of stem, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by 15 species and varieties, according to Dr. Braithwaite's division.—*Vide* Monthly Microscopical Journal.

3. GENUS ARCHIDIUM, Bridel.

WHOLE PLANT—Perennial, small, rarely exceeding $\frac{1}{2}$ inch in height, cæspitose.

STEM—Short, erect, occasionally procumbent, branched.

LEAVES—*Branch leaves*—Alternate, lanceolate, entire, nerve strong and prominent, disappearing usually below the apex; cells large, irregular; marginal ones more evenly disposed, quadrate; *perichæatial leaves*—ovate; lanceolate, denticulate near the apex.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform, in the axils of the perichæatial leaves.

Fertile Flower (ARCHEGONIA)

Vaginula—Short, roundish.

Capsule—Globular, sessile.

Calyptra—Thin, irregularly torn.

Operculum—Wanting.

Peristome—Wanting.

Spores—Large, angular.

GENERAL HABITAT—Moist heaths, on a clayey or chalky soil. Fruit:—March—April.

SPECIES ILLUSTRATED—*Archidium Phascoides* (Bridel).

Reference to Plate—*a*, Plant natural size; *b*, Leaves of stem, $\times 2$ -in.; *bb*, Portion of stem and leaves, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Cellules of mid-leaf and marginal ones, $\times \frac{1}{4}$ -in.; *e*, Basal cells of leaf, $\frac{1}{4}$ -in.; *f*, Capsule with perichæatial leaf, $\frac{1}{4}$ -in.

This genus is represented in Britain by the species figured, and has often been confounded with *Phascum alternifolium*, (Hedw.)

4. GENUS PHASCUM, *Linn.*

WHOLE PLANT—Annual, small, often very minute, from $\frac{1}{8}$ to $\frac{1}{2}$ -inch in height.

STEM—Very short in most of the species.

LEAVES—Erect or spreading, strongly nerved, either disappearing below, or reaching to the point, lanceolate, cellules of middle-leaf large, oblong.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Few, at the base of Fertile flower, mixed with paraphyses.

Fertile Flower (ARCHEGONIA)—Terminal.

Capsule—Ovate or roundish, subsessile, pedicellate, or immersed.

Calyptra—Campanulate or cucullate.

Operculum—In some species there seems to be a trace, but in others even this is wanting.

Peristome—Wanting.

Spores—Small.

GENERAL HABITAT—Fallowes, roadsides, banks, on a clayey or chalky soil. Fruit:—March.

SPECIES ILLUSTRATED—*Phascum cuspidatum* (Schreber).

Reference to Plate—*a*, Plant natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaf, $\times 1$ -in.; *bb*, Same with capsule, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *h*, calyptra, $\times 1$ -in.

This genus is represented in England by 19 species, according to Hobkirk.

5. GENUS GYMNSTOMUM, *Hedw.*

WHOLE PLANT—Perennial, varying from $\frac{1}{4}$ to 1 inch in height.

STEM—Short, caespitose, branched, fastigiata.

LEAVES—Lanceolate, spreading, erect, entire, nerve ceasing below the apex in some species, but sometimes reaching into a translucent point, areolae small, the upper portion dot-like, basal cells irregularly quadrate.

INFLORESCENCE—Both monoicous and dioicous.

Barren Flower (ANTHERIDIA)—With paraphyses.

Fertile Flower (ARCHEGONIA)—With paraphyses, terminal.

Vaginula—Oblong.

Capsule—Oblong, oval, contracted at the mouth.

Calyptra—Cucullate, beaked, extending below the operculum.

Operculum—Conical, with a rather inclined beak.

Annulus—Obscure, persistent.

Peristome—None.

Spores—Small.

GENERAL HABITAT—On rocks or on the ground. Fruit:—Spring and Autumn.

SPECIES ILLUSTRATED—*Gymnostomum Squarrosum* (Wilson).

Reference to Plate—*a*, Plant natural size, $\times 2$ -in.; *aa*, Same, $\times 2$ in.; *b*, Leaves of same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *cc*, Basal cells of leaf and portion of nerve, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, *Operculum*, $\times 2$ -in.; *h*, Antheridia, with paraphyses, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by six species.

6. GENUS WEISSIA, *Hedw.*

WHOLE PLANT—Perennial, tall, caespitose, growing on soil (a very variable plant).

STEM—Long, erect; branches dichotomous.

LEAVES—Spreading, lanceolate, margins involute, nerve strong, areolae small at the upper part of the leaf, quadrate at the base.

INFLORESCENCE—Both monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA)—Gemmiform.

Vaginula—Oblong.

Capsule—Erect, ovate, or subcylindrical, on a long stalk.

Calyptra—Dimidiate.

Operculum—Conical, with long beak.

Annulus—Broad or narrow.

Peristome—Simple, with 16 equidistant lanceolate teeth, transversely barred.

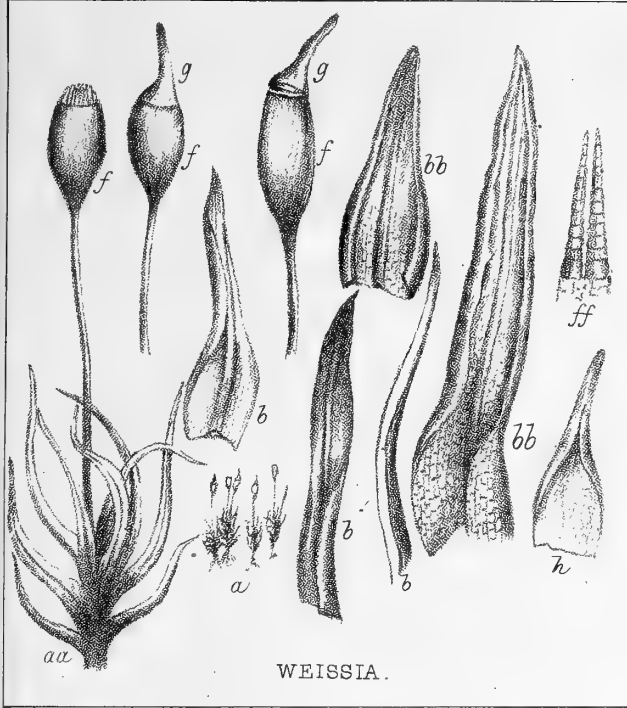
Spores—Small, in some species larger.

GENERAL HABITAT—On banks, or rocks. Fruit:—Spring.

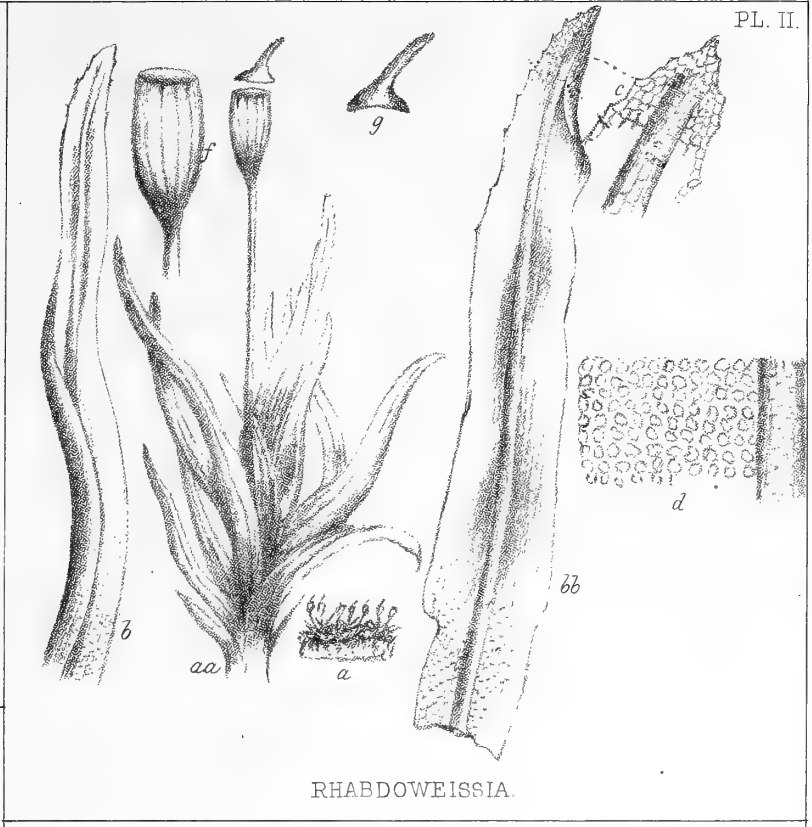
SPECIES ILLUSTRATED—*Weissia controversa* (Hedw.).

Reference to Plate—*a*, Plant natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaves, $\times 1\frac{1}{2}$ -in.; *bb*, Same, $\times 1$ -in.; *f*, Capsules, $\times 2$ -in.; *ff*, Teeth of Peristome, $\times \frac{1}{4}$ -in.; *g*, *Operculum*, $\times 2$ -in.; *h*, *Calyptra*, $\times 1$ -in.

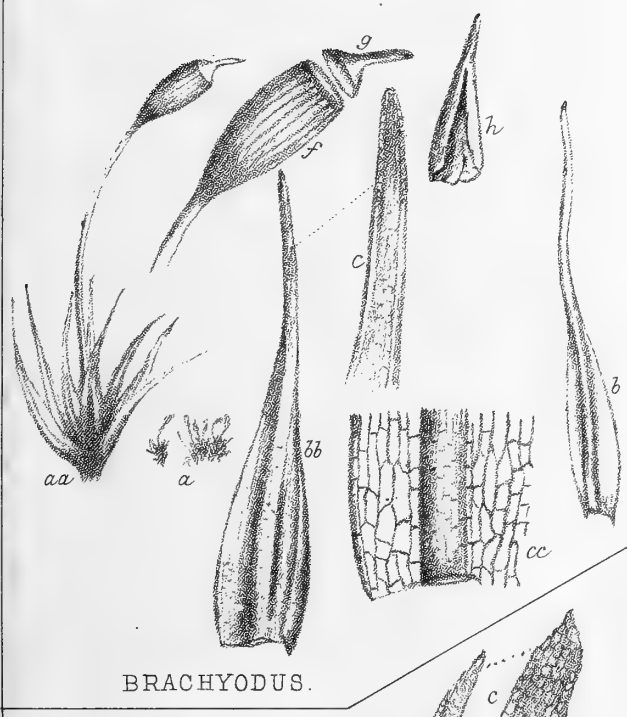
This genus is represented in Britain by eight species, according to Hobkirk.



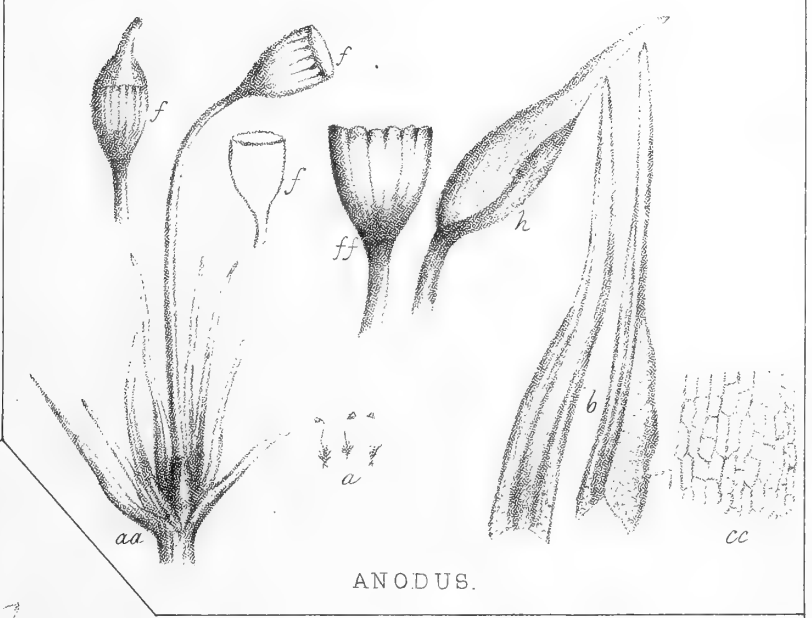
WEISSIA.



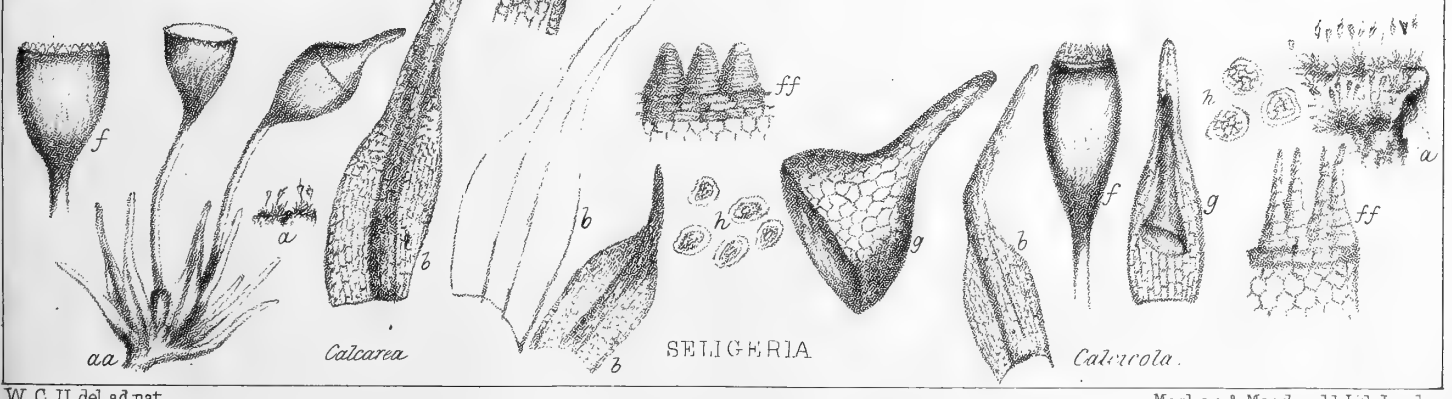
RHABDOWEISSIA.



BRACHYODUS.



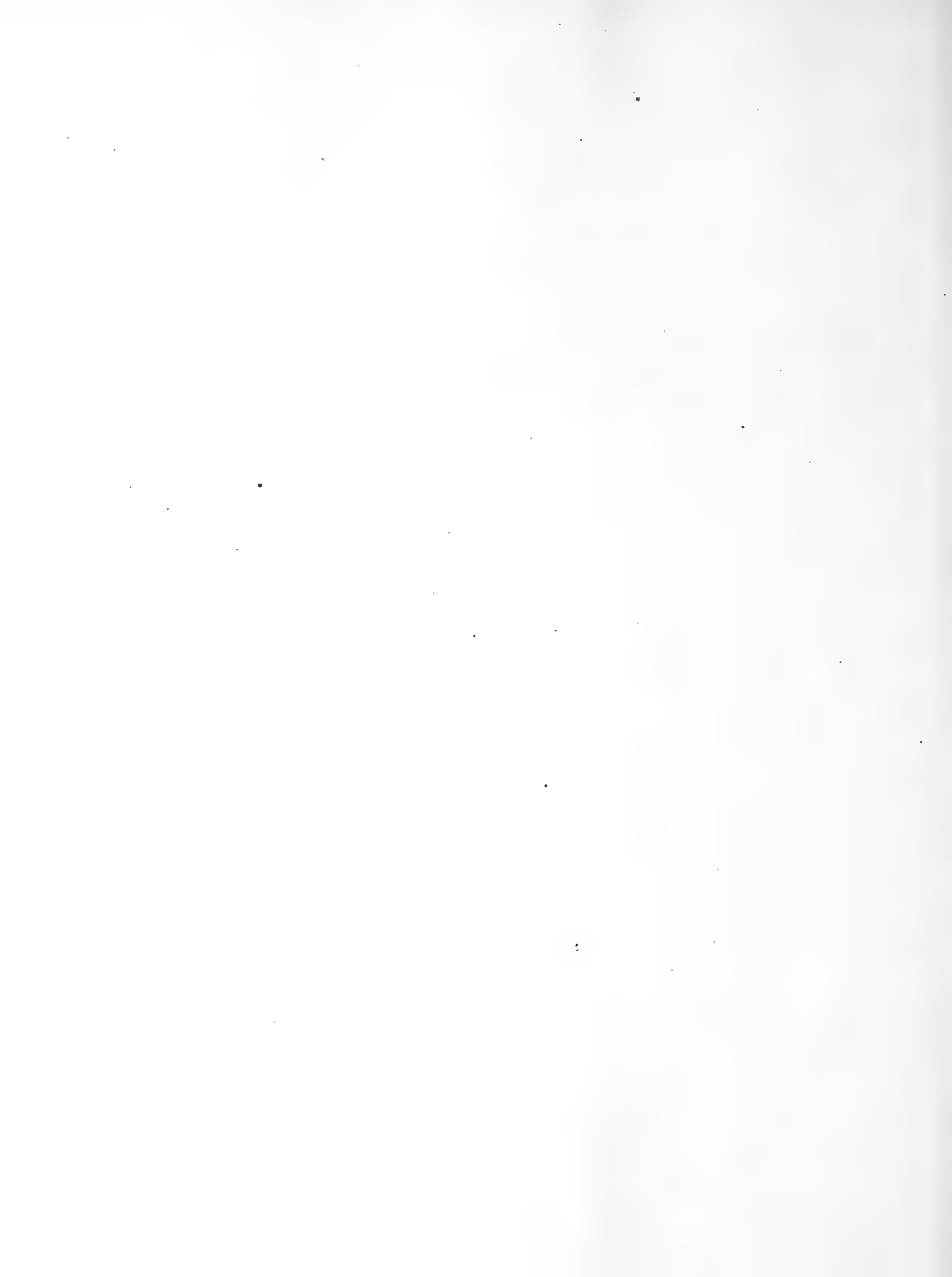
ANODUS.

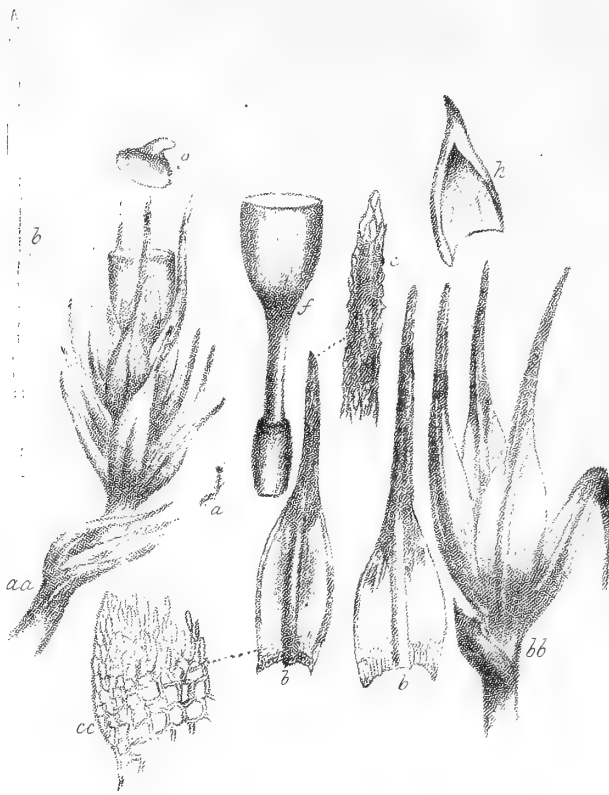


SELIGERIA

Culcareia

Calercola





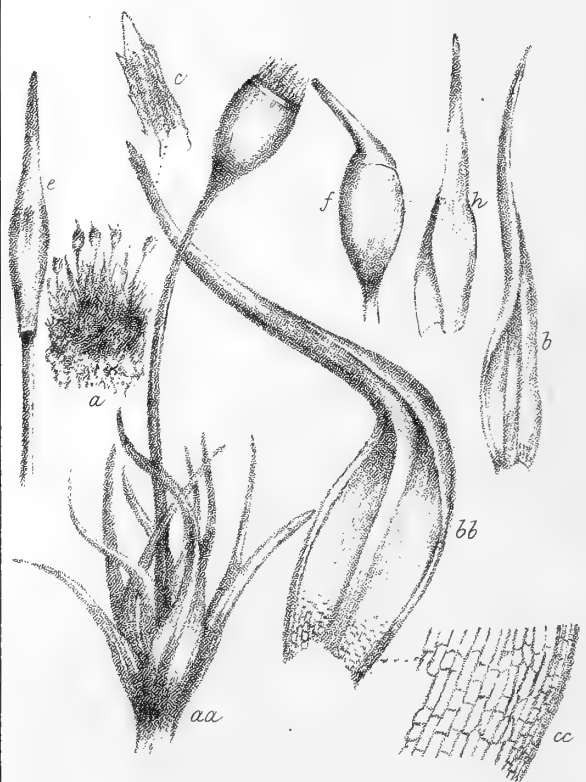
STYLOSTEGIUM



BLINDIA.



ARCTOA.



CYNODONTIUM.

7. GENUS RHABDOWEISSIA, B. & S.

WHOLE PLANT—Perennial, short.

STEM—Dichotomous, erect, tufted, from $\frac{1}{4}$ to $\frac{1}{2}$ -inch in height.

LEAVES—Linear, lanceolate, toothed, crowded, spreading, curved, areolæ pellucid, hexagonal at the base, subquadrate upwards.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA)—Very small.

Vaginula—Oblong.

Capsule—Erect, on a slender straight fruit stalk, oval, striated.

Calyptra—Cucullate.

Operculum—With a slender inclined beak.

Annulus—Persistent, narrow.

Peristome—Very similar to *Weissia*.

Spores—Small, roundish, or oval.

GENERAL HABITAT—Crevices of rocks, in alpine situations. Fruit:—June, July.

SPECIES ILLUSTRATED—*Rhabdoweissia fugax* (B. & S.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaf, $\times 1$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Cellules of mid-leaf and portion of nerve, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.

This genus is represented in Britain by two species.

9. GENUS BRACHYODUS, N. & H.

WHOLE PLANT—Very small, triennial, similar in appearance to a *Seligeria*, from $\frac{1}{4}$ to $\frac{1}{2}$ -inch in height.

STEM—Very short, single or forked, gregarious.

LEAVES—Setaceous, crowded, partially erect, areolæ dense, nerve prominent.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Terminal.

Fertile Flower (ARCHEGONIA)—Terminal.

Vaginula—Cylindrical.

Capsule—Small, ovate on a slender fruit stalk, somewhat striated.

Calyptra—Conical and lobed.

Operculum—Convex, with an inclined beak.

Annulus—Broad.

Peristome—Simple, with 16 short teeth.

Spores—Very small.

GENERAL HABITAT—On sandstone rocks. Fruit:—Spring.

SPECIES ILLUSTRATED—*Brachyodus trichodes* (N. & H.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaf, $\times 1$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *cc*, Basal cells of leaf, $\times \frac{1}{4}$ -in.; *f*, Capsule, with operculum, $\times 1$ -in.; *h*, Calyptra, $\times 1$ -in.

This genus is represented in Britain by the species figured.

10. GENUS SELIGERIA, B. & Sch.

WHOLE PLANT—Small, gregarious, perennial.

STEM—Simple, very short in some species, longer in others, tufted.

LEAVES—Ovate-lanceolate, strongly nerved into a subulate point, very rigid; areolation dense, except the base of the leaf, where the cellules are large and almost quadrate.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform, terminal.

Fertile Flower (ARCHEGONIA)—Gemmiform, terminal.

Vaginula—Cylindrical.

Capsule—Pyriform or elongated, on a curved or upright pedicel; mouth wide.

Calyptra—Cucullate, short.

Operculum—Large, short, rostrate.

Annulus—Wanting.

Peristome—Single, 16 teeth, obtuse or lanceolate.

GENERAL HABITAT—On calcareous rocks chiefly. Fruit:—Spring and summer.

SPECIES ILLUSTRATED—*Seligeria calcarea* (Br. & Sch.), and *Seligeria calcicola* (Mitten).

Reference to Plate—*Calcarea*—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaves of same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of Peristome, $\times \frac{1}{4}$ -in.; *g*, Calyptra, $\times \frac{1}{4}$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in. *Calcicola*—*a*, Plant, natural size; *b*, Leaf of same, $\times 2$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of Peristome, $\times \frac{1}{4}$ -in.; *g*, Operculum and Calyptra, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by six species, according to Hobkirk.

11. GENUS ANODUS, *Br. & Sch.*

WHOLE PLANT—Annual or biennial, gregarious, very short, about $\frac{1}{4}$ inch in height; similar in appearance to a *Seligeria*, but distinguished by the absence of the peristome.

STEM—Minute and slender.

LEAVES—Erect, acute, lanceolate, subulate, slightly denticulate.

INFLORESCENCE—As in *Seligeria*.

Vaginula—Oblong.

Capsule—Cup-shaped, wide mouth.

Calyptra—Dimidiate.

Operculum—Conical, beak short.

Annulus—Wanting.

Peristome—None.

GENERAL HABITAT—Sandstone rocks. Rare. Fruit:—Autumn.

SPECIES ILLUSTRATED—*Anodus Donianus* (Br. & Sch.). *Gymnostomum Donianum* (H. & T.)

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaves, $\times 1$ -in.; *cc*, Basal cells of leaf, $\times \frac{1}{4}$ -in.; *f*, Capsules and operculum, $\times 2$ -in.; *ff*, Same, $\times 1$ -in.; *h*, Young capsule with calyptra, $\times 1$ -in.

This genus is represented in Britain by the species figured.

11. GENUS STYLOSTEGIUM, *Wilson.*

WHOLE PLANT—Perennial, very small, rarely exceeding $\frac{1}{4}$ of an inch in height.

STEM—Densely tufted, flexuose, caespitose, branched.

LEAVES—Ovate-lanceolate, suberect, glossy, subulate, or acuminate; nerve strong; areolæ oblong; basal cells large; *perichatial leaves*—sheathing.

INFLORESCENCE—Monoicous, terminal.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA).

Vaginula—Oblong.

Capsule—Roundish, pyriform, on a short fruit stalk, almost hid in the leaves.

Calyptra—Cucullate.

Operculum—Rostrate.

Peristome—Wanting.

Annulus—None.

Spores—Small.

GENERAL HABITAT—Crevices of Alpine rocks. Rare. Fruit:—July.

SPECIES ILLUSTRATED—*Stylostegium caespiticium* (Br. & Sch.)

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaves, $\times 1$ -in.; *bb*, Portion of stem with leaves, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *cc*, Basal cells of leaf, $\times \frac{1}{4}$ -in.; *f*, Capsule with vaginula, $\times 1$ -in.; *g*, Operculum, $\times 2$ -in.; *h*, Calyptra, $\times 1$ -in.

This genus is represented in Britain by the species figured.

13. GENUS BLINDIA, *Wilson.*

WHOLE PLANT—Perennial, slender, varying in height from $\frac{1}{4}$ to 2 or 3 inches, tufted.

STEM—Solid, rooting at the base, naked of leaves when old, branched dichotomously.

LEAVES—Lanceolate, setaceous, glossy, firm; nerve thick; margin entire; areolæ small, except at the base, where the cells become larger and subquadrate; *perichatial leaves*—sheathing.

INFLORESCENCE—Dioicous, terminal.

Barren flower (ANTHERIDIA)—Gemmiform.

Fertile flower (ARCHEGONIA).

Vaginula—Oblong.

Capsule—Pyriform, erect, on a short reddish fruit stalk.

Calyptra—Cucullate, cloven.

Operculum—Large, with a long beak.

Peristome—Single, with 16 teeth, remotely barred, entire, occasionally cleft, deep red.

Annulus—Wanting.

Spores—Small.

GENERAL HABITAT—On moist Alpine rocks. Fruit:—Summer.

SPECIES ILLUSTRATED—*Blindia acuta* (Br. & Sch.), *Weissia acuta* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaves, $\times 1$ -in.; *c*, Basal cells of leaf, with portion of nerve, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.

This genus is represented in Britain by the species figured. Wilson remarks that his views concerning this new genus are in accordance with those of Bruch and Schimper, and that it forms with *Stylostegium* a special group of the family *Seligeriaceæ*.

14. GENUS ARCTOA, *Bruch & Sch.*

WHOLE PLANT—Perennial, small, $\frac{1}{4}$ to 1 inch in height.

STEMS—Densely tufted.

LEAVES—Crowded, rather secund, sometimes falcate, lanceolate, setaceous, rigid, glossy, varying from green to reddish-brown; nerve strong and thick. *Perichætal leaves*—large and sheathing.

INFLORESCENCE—Monoicous, terminal.

Barren Flowers (ANTHERIDIA)—Gemmiform.

Fertile Flowers (ARCHEGONIA)—Terminal.

Vaginula—Oblong.

Capsule—Usually erect, rather terminal; 8 furrowed when dry.

Calyptra—Inflated, cucullate.

Operculum—Obliquely rostrate, large.

Peristome—Teeth 16, usually cleft, sometimes trifid, deep red, subulate.

Annulus—Simple.

Spores—Small, reddish-brown.

GENERAL HABITAT—Crevices of rocks in northern regions only. Fruit:—July.

SPECIES ILLUSTRATED—*Arctoa fulvella* (Br. & Sch.), *Dicranum fulvellum* (Hook & Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *c*, Apex of same, $\times \frac{1}{2}$ -in.; *cc*, Basal cells of same, $\times \frac{1}{2}$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{2}$ -in.; *g*, Calyptra, $\times 2$ -in.

This genus is represented in Britain by the species figured.

15. GENUS CYNODONTIUM, *Bruch & Sch.*

WHOLE PLANT—Erect, perennial.

STEMS—Cæspitose, elongate, branched.

LEAVES—Lanceolate, subulate; margins slightly reflexed, remotely denticulate; areolæ quadrate—larger at the base.

INFLORESCENCE—Monoicous.

Barren Flowers (ANTHERIDIA)—Gemmiform.

Fertile Flowers (ARCHEGONIA)—3 leaved.

Vaginula—Cylindrical.

Capsule—Erect, ovate, on an erect fruit stalk, smooth.

Calyptra—Large, cucullate.

Operculum—Obliquely rostrate.

Peristome—Single, teeth 16, lanceolate, irregular, confluent, bright red, barred, fragile.

Annulus—Simple, breaking off.

Spores—Moderate size.

GENERAL HABITAT—On rocks in hilly districts. Fruit:—June.

SPECIES ILLUSTRATED—*Cynodontium Bruntoni* (Br. & Sch.), *Didymodon Bruntoni* ? (Hook & Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *cc*, Basal cells of same, $\times \frac{1}{2}$ -in.; *e*, Young capsule and calyptra, $\times 2$ -in.; *f*, Capsule and operculum, $\times 2$ -in.; *h*, Calyptra, $\times 1$ -in.

This genus is represented in Britain by the species figured. "An ambiguous genus" (Wilson).

16. GENUS DICRANUM, *Hedwig.*

WHOLE PLANT—Perennial, tall, from 2 to 6 inches in height, erect, in matted patches.

STEMS—Varying from $\frac{1}{4}$ to several inches, forming more or less dense tufts, frequently matted together with numerous red radicles.

LEAVES—Usually crowded, and of close texture, sometimes spreading, secund, lanceolate, subulate, in 6 to 8 rows; nerve narrow, either projecting beyond the apex or ceasing below; areolation dot-like, or elongated, narrow, small, basal cells larger, quadrate. *Perichætal leaves*—larger and closely sheathed.

INFLORESCENCE—Both monoicous and dioicous, terminal.

Barren Flower (ANTHERIDIA)—Gemmiform; paraphyses filiform.

Fertile Flower (ARCHEGONIA)—Styles long.

Vaginula—Cylindrical.

Capsule—Erect, or cernuous, gibbous, ovate, or oblong, often strumose, the neck in some species tapering gradually into the erect seta.

Calyptra—Beak long, reaching half way down the capsule.

Operculum—Rostrate, oblique, with slender beak.

Peristome—Single, with 16 equidistant teeth, cloven half way, with transverse bars, usually red.

Annulus—Consisting of 2 or 3 rows of cellules.

Spores—Muriculate (in the species figured), colour reddish.

GENERAL HABITAT—On rocks, on the ground, or on trunks of trees. Fruit:—June to December.

SPECIES ILLUSTRATED—*Dicranum Scoparium* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, slightly magnified; *b*, Stem leaves, $\times 2$ -in.; *bb*, Perichætal leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *cc*, Basal cells of leaf, $\frac{1}{2}$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{2}$ -in.; *g*, Operculum, $\times 2$ -in.; *h*, Calyptra, $\times 2$ -in.; *i*, Spores, $\times \frac{1}{2}$ -in.

This genus is represented in Britain by 28 species, according to Hobkirk.

17. GENUS LEUCOBRYUM, *Hampe*.

WHOLE PLANT—From 1 to 4 inches or more in height, in compact, whitish, or glaucous tufts, erect.

STEMS—Varying in length, dichotomously branched, rigid.

LEAVES—Succulent, closely crowded, suberect, lanceolate, from an ovate base, caniculate above; marginal cells narrow and elongated, pale glaucous, yellowish-white, absorbent, somewhat obtuse, with a very faint nerve [too strongly shown in the figure].

INFLORESCENCE—Monoicous.

Barren Flowers (ANTHERIDIA)—Gemmiform, clustered about 4 together, small.

Fertile Flowers (ARCHEGONIA)—Very long on paraphyses.

Vaginula—Oblong.

Capsule—Cernuous, or erect, reddish-brown.

Calyptra—Pale, cucullate.

Operculum—Rostrate.

Peristome—16 bifid teeth, incurved.

Annulus—None.

Spores—Small.

GENERAL HABITAT—Boggy heaths and moist woods. Fruit (very rare):—March.

SPECIES ILLUSTRATED—*Leucobryum glaucum* (Hampe), *Dicranum glaucum* (Hedw.).

Reference to Plate—*a*, Plant, natural size (barren and fertile plants); *b*, Stem leaf, $\times 2$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Portion of capsule, $\times 1$ -in.; *g*, Horizontal section of leaf, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured, which "cannot be confounded with any other British moss" (Wilson).

18. GENUS CERATODON, *Bridel*.

WHOLE PLANT—Erect, varying in height from 1 to 2 inches, according to the locality; perennial, growing on the soil.

STEMS—Cæspitose, with innovations, scarcely branched.

LEAVES—3 to 5 in a row, crowded, concave, lanceolate, pointed, keeled, entire, except at the apex, where they are remotely denticular (see fig. *c*.); nerve strong; areolation dot-like, quadrate, pellucid, and larger at the base, colour dark green.

INFLORESCENCE—Dioicous, terminal.

Barren Flowers (ANTHERIDIA) } —Slender.
Fertile Flowers (ARCHEGONIA) }

Vaginula—Oblong.

Capsule—On a long seta almost erect, cylindrical, furrowed when dry.

Calyptra—Cucullate, having a long beak.

Operculum—Conical.

Peristome—With 16 teeth, deeply cloven, in pairs, lanceolate, united at the base, red.

Annulus—Deciduous.

Spores—Small.

GENERAL HABITAT—Sandy banks, &c., in moist places. Fruit:—April and May.

SPECIES ILLUSTRATED—*Ceratodon purpureus* (Bridel), *Didymodon purpureus* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *cc*, Base of same, $\times \frac{1}{2}$ -in.; *e*, *Vaginula*, $\times 1$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{2}$ -in.; *g*, Operculum, $\times 1$ -in.; *h*, Annulus, $\times \frac{1}{2}$ -in.; *i*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by two species. The species figured is very common in Britain and in all parts of the world. The other *C. cylindricus*, is very local. The teeth of the peristome of this species form a very beautiful object for the microscope.

19. GENUS DICRANODONTIUM, *Br. & Sch.*

WHOLE PLANT—Perennial, erect, from 1 to 3 inches in height, resembling a *Dicranum*, crowded in dense patches.

STEMS—Cæspitose, covered with radicles, which are reddish.

LEAVES—Falcate, setaceous, having a dilated base, with a very broad predominant nerve; areolæ narrow; cells large, quadrate, hexagonal at the base, sheathing, dilated.

INFLORESCENCE—Dioicous.

Barren Flowers (ANTHERIDIA) } Gemmiform, terminal.
Fertile Flowers (ARCHEGONIA) }

Vaginula—Oblong.

Capsule—Smooth, thin, on an arcuate seta.

Calyptra—Cucullate, entire, longer than the operculum.

Operculum—Conical.

Peristome—Single, teeth 16, linear, lanceolate, striate.

Annulus—Persistent, narrow.

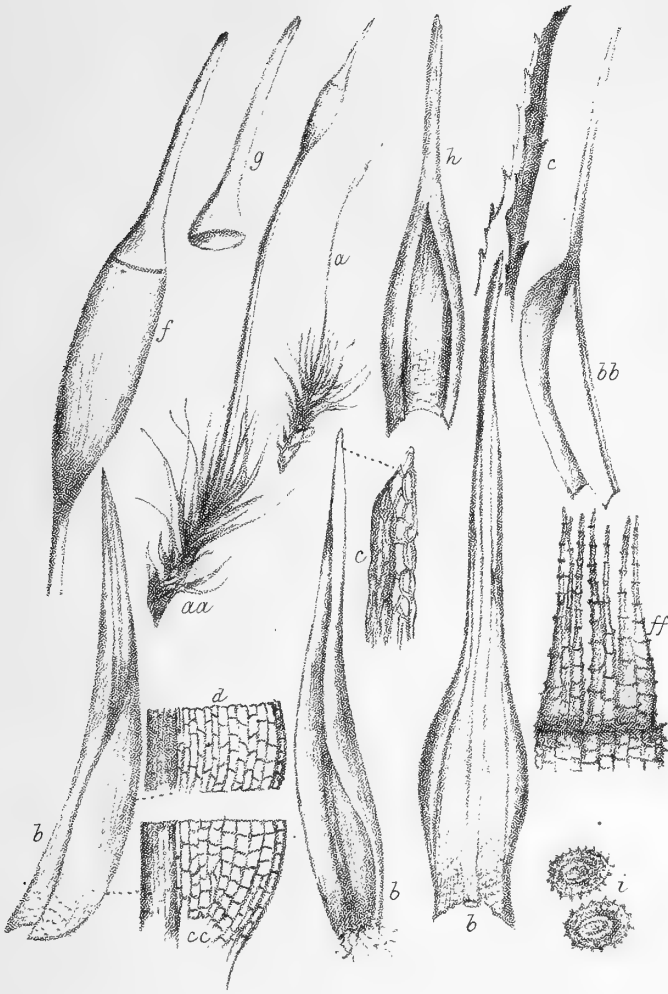
Spores—Small.

GENERAL HABITAT—Growing on the ground, hilly districts. Rare. Fruit:—October.

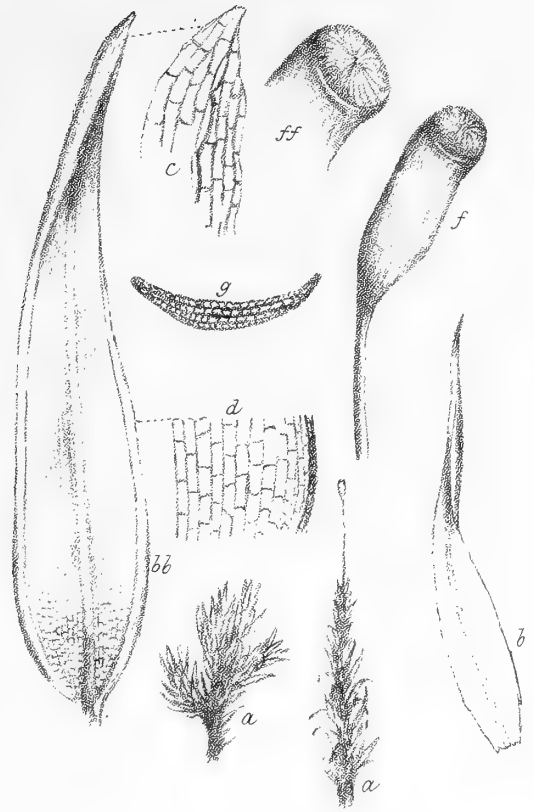
SPECIES ILLUSTRATED—*Dicranodontium longirostre* (Br. & Sch.).

Reference to Plate—*a*, Plant, natural size; *aa*, Stem leaf, $\times 1$ -in.; *b*, Branch leaf, $\times 1$ -in.; *bb*, Portion of branch and leaves, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *cc*, Basal cells of same, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.

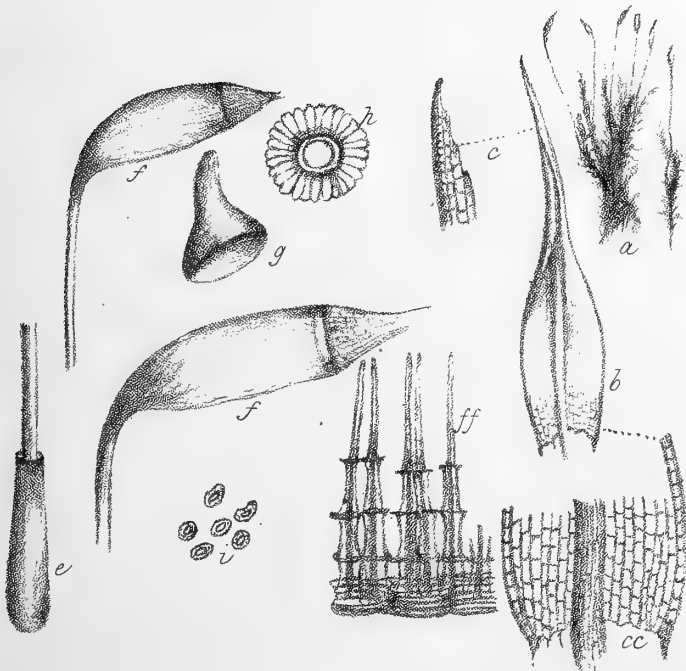
This genus is represented in Britain by the species figured.



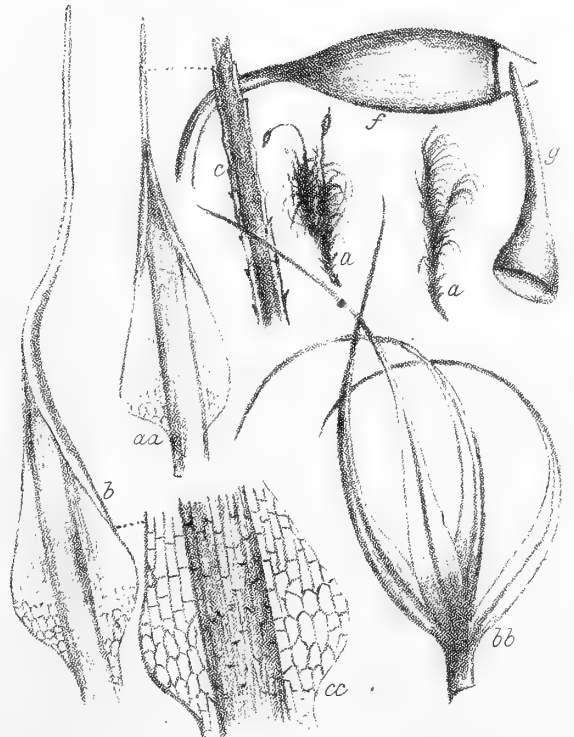
DICRANUM.



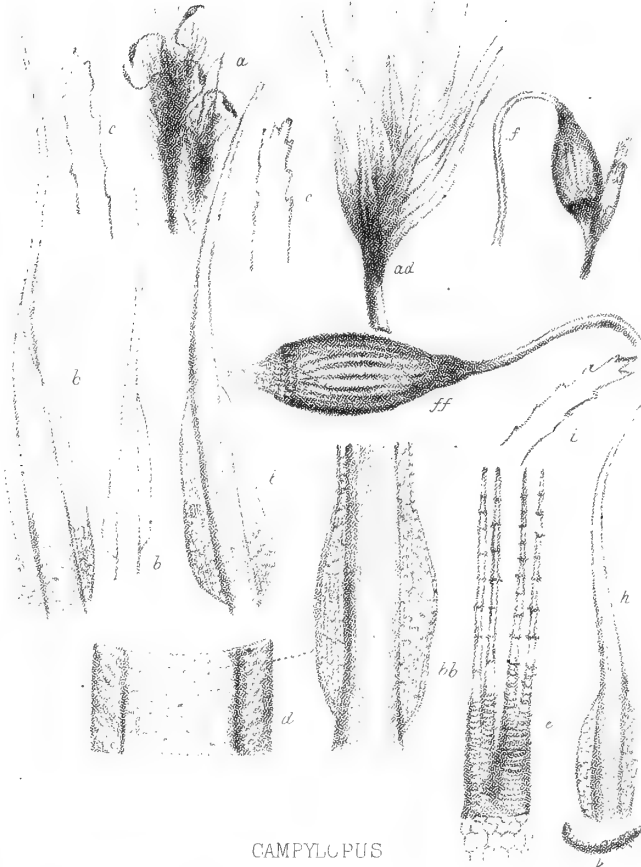
LEUCOBRYUM



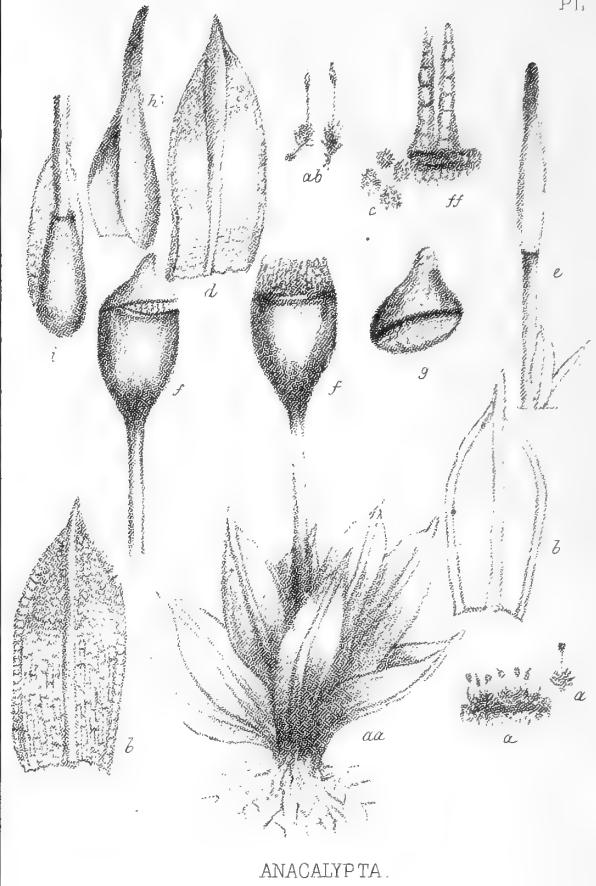
CERATODON



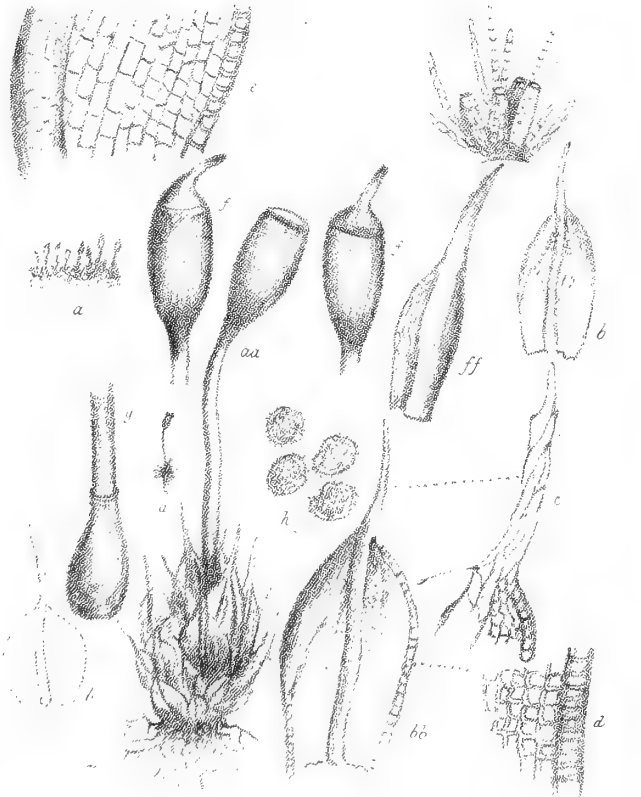
DICRANODONTIUM.



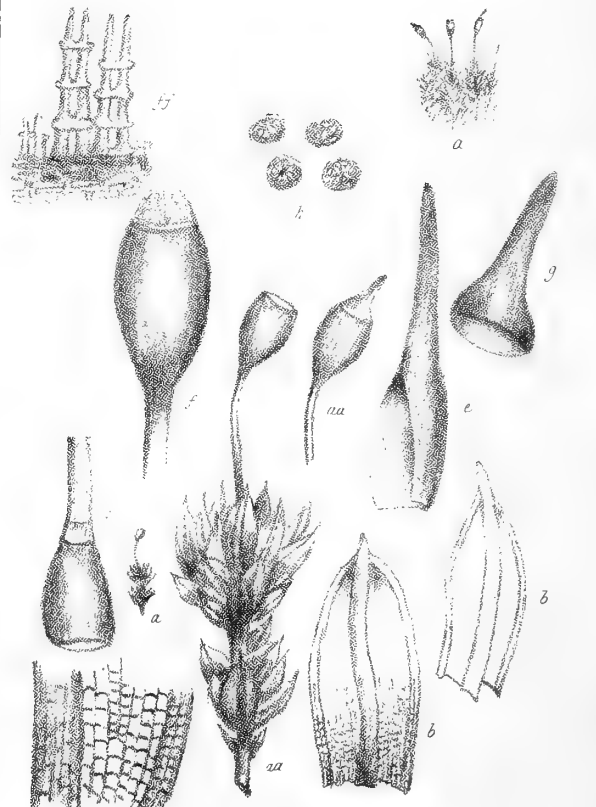
CAMPYLOPUS



ANACALYPTA.



POTTIA



DESMATODON.

20. GENUS CAMPYLOPUS, *Bridel.*

WHOLE PLANT—Perennial, erect, yellow-green, caespitose, varying from $\frac{1}{4}$ inch to 3 inches in height densely leafy.

STEM—Dichotomously branched, with reddish or purple radicles, tufted, and brittle.

LEAVES—Imbricated, crowded, mostly in eight rows, erect, somewhat rigid, much acuminate to a subulate or setaceous point, which is denticulate, dark green, or blackish in some species, yellowish-green in others; nerve very prominent and broad; areolae subquadrate at the base, elongated above.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Oblong, having long filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Aggregate.

Vaginula—Oblong.

Capsule—Ovate, striated, drooping, on an arcuate fruit stalk, yellowish-brown when young, but when matured rich brown, in some species several on the same stem.

Calyptra—Large, beautifully and delicately fringed at the base.

Operculum—Rostrate.

Peristome—Single, having 16 narrow elongated bifid teeth, bright red.

Annulus—Large.

Spores—Small.

GENERAL HABITAT—On wet rocks, turfey bogs, on moist heathy places, &c. Fruit:—October, November, and March.

SPECIES ILLUSTRATED—*Campylopus flexuosus* (Dill.), *Dicranum flexuosum* (Hedw.), and in part *C. torfaceus* (Br. & Sch).

Reference to Plate—*a*, Plant, natural size, *C. flexuosus*; *ad*, Portion of branch, $\times 2$ -in.; *b*, Stem leaves, $\times 2$ -in.; *bb*, Base of stem leaf, $\times 1$ -in.; *c*, Apex of same, $\times \frac{1}{4}$ -in.; *d*, Portion of mid-leaf, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *f*, Capsule and Calyptra, $\times 2$ -in.; *ff*, Capsule with teeth, $\times 1$ -in.; *h*, Stem leaf of *C. torfaceus*, $\times 2$ in.; *i*, Apex of same, $\times \frac{1}{4}$ in.; *k*, Horizontal section of same, $\times 1$ -in.

This genus is represented in Britain by thirteen species, according to Hobkirk. In Wilson's Bryo. Brit. six species only are given, seven species having been since discovered.

21. GENUS POTTIA, *Ehrh.*

WHOLE PLANT—Annual, loosely tufted or single, short, from $\frac{1}{4}$ to $\frac{1}{2}$ an inch in height, erect.

STEM—Very short and simple.

LEAVES—Spreading, erect, concave, piliferous, entire, rather broad ovate-oblong, lamellate; nerve strong, excurrent, areolation hexagonal upwards; basal cells quadrate.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Occasionally gemmiform, 3 or 4 together, with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Having long styles, with few paraphyses.

Vaginula—Oblong.

Capsule—Ovate-oblong, on an erect fruit stalk, varying in length, colour reddish-brown.

Calyptra—Cucullate, usually smooth.

Operculum—Convex or flattish, with a somewhat long oblique beak.

Peristome—Wanting.

Annulus—When present, simple.

Spores—Moderately large, granulated, colour ochraceous.

GENERAL HABITAT—On clayey and sandy banks, fallows, and frequently on mud walls, and also on moist banks near the sea. Fruit:—February, April, and May.

SPECIES ILLUSTRATED—*Pottia cavifolia* (Ehrh.), *Gymnostomum ovatum* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaves, $\times 2$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Cells of mid-leaf, $\times \frac{1}{4}$ -in.; *e*, Basal cells of leaf, $\times \frac{1}{4}$ -in.; *f*, Capsule $\times 2$ -in.; *ff*, Calyptra, $\times 1$ -in.; *g*, Vaginula, 1-in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, Antheridia with paraphyses, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by nine species.

22. GENUS ANACALYPTA, *Rohl.*

WHOLE PLANT—Annual, or biennial, gregarious, similar in growth to *Pottia*, from $\frac{1}{4}$ to $\frac{1}{2}$ inch in height.

STEM—Short, varying in height from 1 line to $\frac{1}{4}$ inch.

LEAVES—Spreading, ovate-acuminate, in one species oval; margin revolute; upper leaves larger, with a strong prominent nerve, colour bright green; areolation small and dense above, quadrate at the base.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Occasionally gemmiform.

Fertile Flower (ARCHEGONIA)—3 to 4, with longish styles.

Vaginula—Oblong.

Capsule—Oval on a straight fruit stalk.

Calyptra—Cucullate, shorter than the capsule.

Operculum—More or less rostrate.

Annulus—Persistent, simple.

Peristome—Single, having 16 teeth, variable in form, united at the base.

Spores—Small.

GENERAL HABITAT—Chalk hills, calcareous soil, and clayey banks, fallows, and fields. Fruit:—January, March.

SPECIES ILLUSTRATED—*Anacalypta Starkeana* (Nees & Hornsch.), and *Anacalypta lanceolata* (Rohl.), in part.

Reference to Plate—*a*, Plant, natural size, *A. Starkeana*; *aa*, Same, $\times 2$ -in.; *b*, Stem leaves, $\times 1$ -in.; *e*, Young capsule and calyptra, $\times 2$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *g*, Operculum, $\times 2$ -in.; *ab*, Plant, natural size, *A. lanceolata*; *c*, Spores, $\times \frac{1}{4}$ -in.; *d*, Stem leaf, $\times 1$ -in.; *h*, Calyptra, $\times 1$ -in.; *i*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by four species, according to Hobkirk and Wilson.

23. GENUS DESMATODON, *Bridel.*

WHOLE PLANT—Perennial, in tufts, varying in height from $\frac{1}{4}$ to $\frac{1}{2}$ inch.

STEM—Somewhat branched, from 1 line to $\frac{1}{4}$ inch in height.

LEAVES—Spreading, oval-oblong, very similar to those of *A. Starkeana*, with strong nerve, thickened near the apex, excurrent, concave; areolæ small and round in the upper part, rectangular at the base.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA).

Vaginula—Oblong.

Capsule—Oval, reddish-brown, on a straight pedicel, erect.

Calyptra—Cucullate, long.

Operculum—Conical, having a longish beak.

Annulus—None.

Peristome—Single, with 16 teeth, connected in pairs, erect, red, varying in length.

Spores—Small.

GENERAL HABITAT—On clayey banks by the sea coast. Fruit:—March.

SPECIES ILLUSTRATED—*Desmatodon nervosus* (Br. & Sch.), *Trichostomum convolutum* (Brid.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaves, $\times 1$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Calyptra, $\times 1$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *g*, Operculum, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by two species according to Wilson. Hobkirk remarks, *vide* "Tortula."

24. GENUS DISTICHIMUM, *Br. & Sch.*

WHOLE PLANT—Perennial, caespitose, with innovations, and dichotomously branched, from 1 inch to 2 inches in height.

STEM—Flexuose, erect, with radicles.

LEAVES—Distichous, glossy, flexuose, spreading, dilated, subulate, with a broad conspicuous nerve; areolæ small on the upper part.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Naked, axillary, cylindrical.

Fertile Flower (ARCHEGONIA)—Having long styles, paraphyses short.

Vaginula—Oblong.

Capsule—Oblong, erect, or subcylindrical, on a long slender fruit stalk, colour reddish, or olive brown.

Calyptra—Cucullate, with slender beak.

Operculum—Conical.

Peristome—Teeth 16, single, linear, bifarious.

Annulus—Broad and distinct.

Spores—Smooth, small.

GENERAL HABITAT—Alpine situations, on the mountains of Wales, Ireland, and North Britain. Fruit:—Summer.

SPECIES ILLUSTRATED—*Distichium capillaceum* (Br. & Sch.), *Didymodon capillaceus* (Web. & Mohr., Hook. & Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apices of stem leaf, $\times \frac{1}{2}$ -in.; *d*, Cells of mid-leaf, $\times \frac{1}{4}$ -in.; *f*, Portion of capsule, $\times 1$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *g*, Branch, $\times 1$ -in.

This genus is represented in Britain by two species.

25. GENUS DIDYMODON, *Br. & Sch.*

WHOLE PLANT—Perennial, erect, from $\frac{1}{2}$ to 1 inch in height, slightly caespitose, growing usually on the ground.

STEM—Branched, with innovations at the base, reaching to an equal height.

LEAVES—Lanceolate, with acuminate points; margins, recurved, entire, having dot-like cellules above, opaque; basal cells large, elongated, semi-transparent; lower leaves reddish, by which it is easily distinguished.

INFLORESCENCE—As in *Tortula* and *Trichostomum*.

Barren Flower (ANTHERIDIA)—Gemmiform, with oblong anthers.

Fertile Flower (ARCHEGONIA).

Vaginula—Oblong.

Capsule—Erect, on a long fruit stalk.

Calyptra—Cucullate, reaching more than half way down the capsule.

Operculum—Conical, with a short beak.

Peristome—With 16 lanceolate teeth, variable in size and structure, colour pale reddish.

Annulus—Narrow and simple.

Spores—Small.

GENERAL HABITAT—On a clayey or a gravelly soil, limestone walls, and shady rocks. Fruit:—Spring and winter.

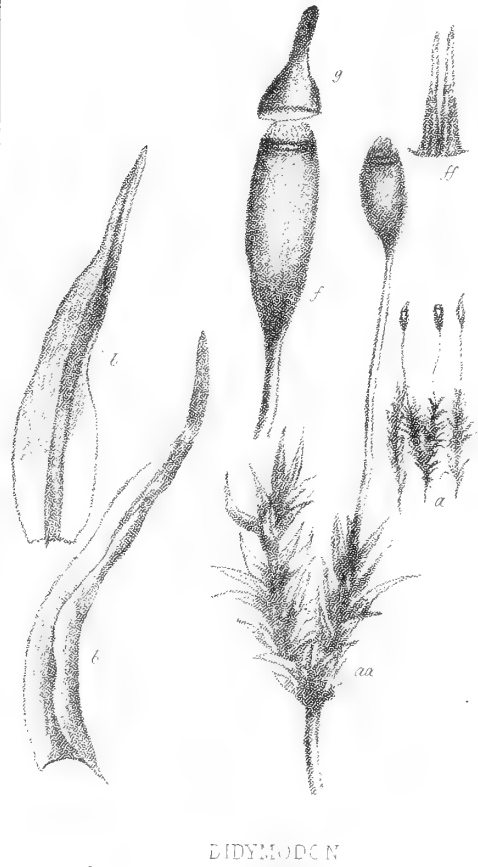
SPECIES ILLUSTRATED—*Didymodon rubellus* (Br. & Sch.), *Weissia curvirostra* (Hook. & Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaves, $\times 1$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *g*, Operculum, $\times 1$ -in.

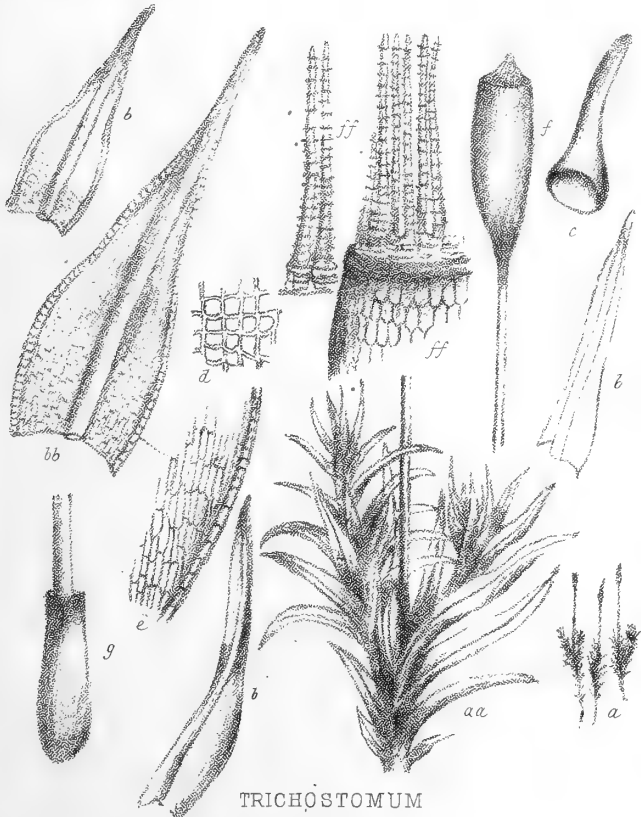
This genus is represented in Britain by six species according to Hobkirk. Wilson observes that it is closely allied to *Trichostomum*, and is also connected with *Anacalypta* and *Desmatodon*.



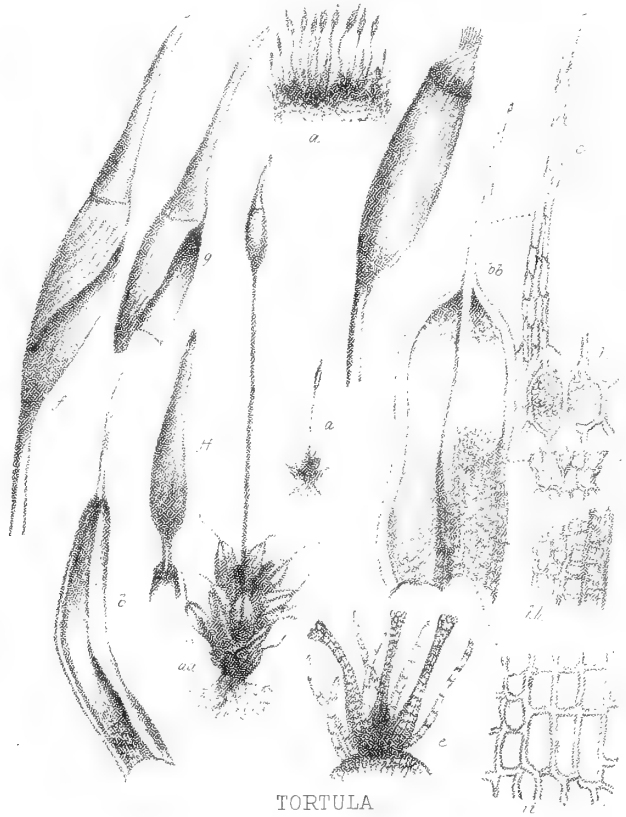
DISTICHUM.



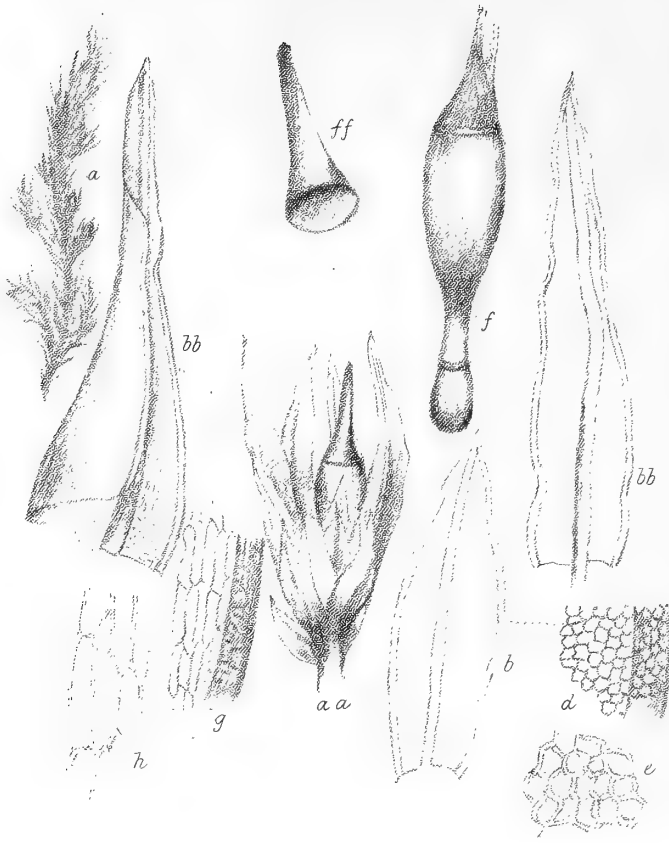
DIDYMON.



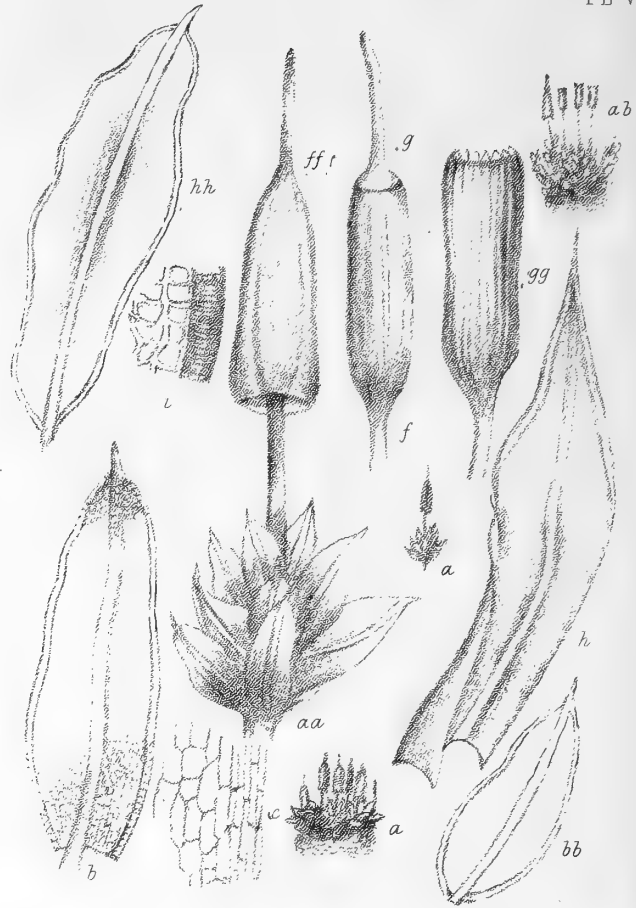
TRICHOSTOMUM



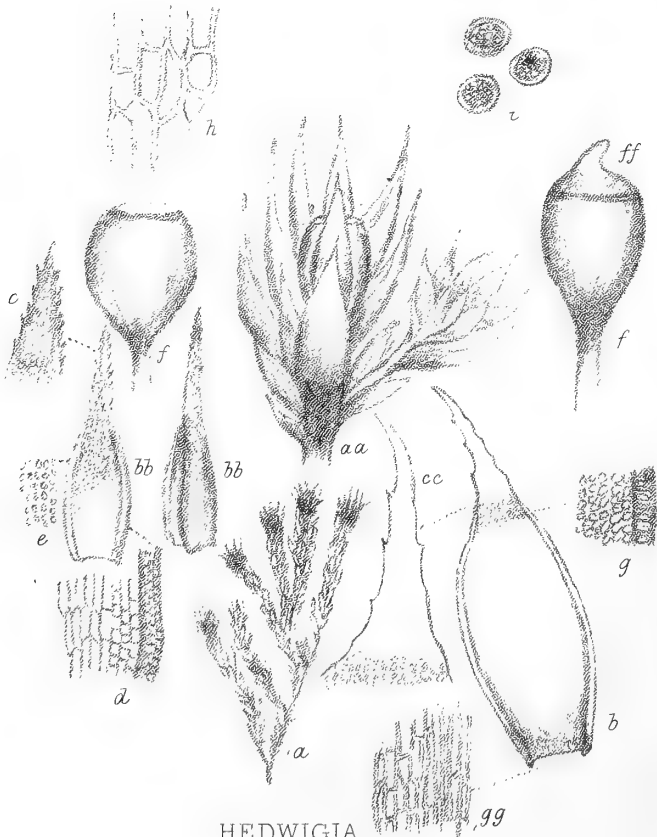
TORTULA



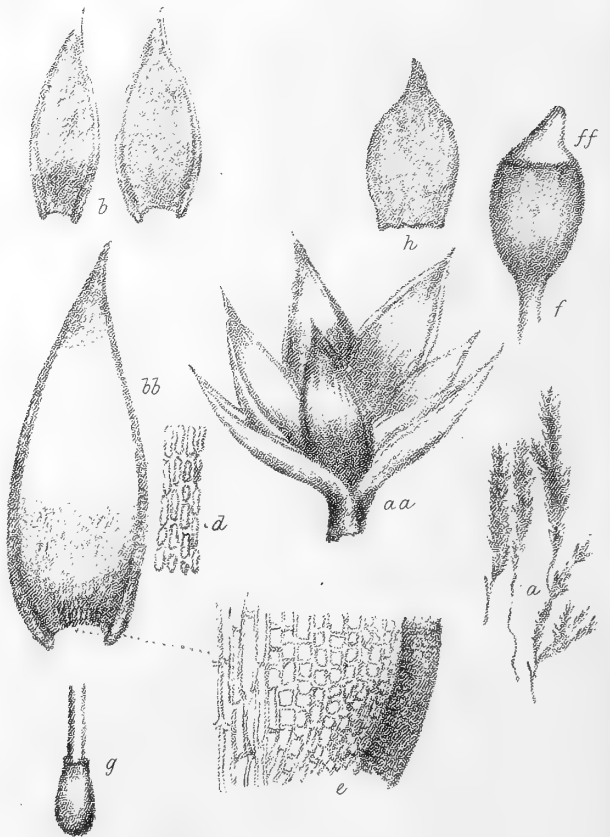
CINCLIDOTUS



ENCALYPTA



HEDWIGIA



HEDWIGIDIUM

26. GENUS TRICHOSTOMUM, *Br. & Sch.*

WHOLE PLANT—Perennial, from 1 inch to 3 inches in height, in patches on the ground, sometimes on stones; habit of *Tortula*.

STEM—Simple, or branched, flexuose, slender, fasciculate.

LEAVES—Lanceolate, lanceolato-subulate, with 5 to 7 or 8 in a row, in some species oblong-ligulate, obtuse, channelled, densely cellular; areolæ round, dot-like in the upper part; basal cells elongated; nerve very thick and prominent, reaching to, or beyond the apex, and forming a short point.

INFLORESCENCE—Monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Terminal, gemmiform.

Fertile Flower (ARCHEGONIA)—With styles and longish paraphyses.

Vaginula—Oblong, cylindrical.

Capsule—Oval, ovato-oblong, smooth, on a long fruit stalk, erect, coriaceous more or less.

Calyptra—Smooth, cucullate.

Operculum—Elongated, obliquely rostrate.

Peristome—Single, with 32 long, erect, granulose teeth in unequal pairs, united together.

Annulus—Simple or compound.

Spores—Small.

GENERAL HABITAT—On chalky soil commonly near the sea, moist rocks, on clayey banks, and wet sandy situations.

Fruit :—Throughout the year.

SPECIES ILLUSTRATED—*Trichostomum tophaceum* (Bridel), *Didymodon trifarius* (Hook. & Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *ab*, Branch leaf, $\times 2$ -in.; *c*, Operculum, $\times 2$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{4}$ -in.; *e*, Basal cells, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Teeth of Peristome, $\times \frac{1}{4}$ -in.; *g*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by eleven species, according to Hobkirk.

27. GENUS TORTULA, *Schreb.*

WHOLE PLANT—Perennial, or biennial, erect, from $\frac{1}{2}$ inch to 3 inches or more in height; yellowish-green; gregarious.

STEM—Cæspitose, with innovations.

LEAVES—Ovate, lanceolate, crowded, suberect, or spreading, recurved or curved, carinate or concave; margin entire, thickened, reflexed or inflexed; nerve stout, commonly extending beyond the apex, and forming a hair-like semi-transparent point; areolæ very dense, dotlike, opaque; in the upper portion of the leaf the basal cells diaphanous, quadrate.

INFLORESCENCE—Monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform, oblong, with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—With styles and moderately long paraphyses.

Vaginula—Oblong.

Capsule—Usually erect, cylindrical, or ovate, oblong, smooth, on a straight fruit stalk, red or reddish-brown.

Calyptra—Cucullate, with a long beak.

Operculum—Subulate, having a conical base and an oblique beak spirally arranged.

Peristome—Having 32 long, filiform, twisted teeth, of a deep red colour, united by a narrow basilar membrane.

Annulus—Wanting in some species, but where present composed of a single row of cellules.

Spores—Varying in size.

GENERAL HABITAT—In chalk pits, on walls, stones and clayey banks, on limestone rocks, banks near the sea coast, about the roots and on the trunks of trees, and on thatched roofs. Fruit :—Throughout the year.

SPECIES ILLUSTRATED—*Tortula muralis* (Timm.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, slightly magnified; *b*, Stem leaf, $\times 2$ -in.; *bb*, Same, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Capsule, $\times 1$ -in.; *e*, Archegonia, $\times \frac{1}{4}$ -in.; *f*, Capsule, with calyptra, $\times 1$ -in.; *ff*, Young capsule, $\times 2$ -in.; *g*, Calyptra, $\times 1$ -in.; *h*, Cellules of mid-leaf, $\times \frac{1}{4}$ -in.; *i*, Same, $\times \frac{1}{2}$ -in.; *hh*, Basal cells of leaf, $\times \frac{1}{2}$ -in.; *ii*, Same, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by thirty-two species. Some species are amongst our commonest mosses.

28. GENUS CINCLIDOTUS, *Br. & Sch.*

WHOLE PLANT—Perennial, from 3 to 6 inches in height, growing in tufts and floating in the water, dark green.

STEM—Having short fasciculate branches.

LEAVES—Lanceolate, thick, firm; margin thick; mid-leaf cells hexagonal; basal cells somewhat oblong. *Perichaetial leaves*—Large, tapering, and narrow, especially towards the apex, with larger oblong basal cells.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Oblong, paraphyses filiform.

Fertile Flower (ARCHEGONIA)—Small, paraphyses filiform.

Vaginula—Ovate.

Capsule—Immersed, ovate or oblong, smooth, brown.

Calyptra—Conical, erect.

Operculum—Mitriform.

Peristome—Single, with 32 long thread-like teeth, similarly twisted as in *Tortula*.

Annulus—None.

Spores—Olive-coloured, small.

GENERAL HABITAT—On wood and stones, in rivers and streams, local.

SPECIES ILLUSTRATED—*Cinclidotus fontinaloides* (P. Beauv.).

Reference to Plate—*a*, Plant, slightly magnified; *aa*, Branch of same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *bb*, Perichaetial leaves, $\times 1$ -in.; *f*, Capsule with vaginula, $\times 1$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{4}$ -in.; *g*, Same, $\frac{1}{4}$ -in.; *ff*, Operculum, $\times 1$ -in.; *g*, basal cells of leaf, $\times \frac{1}{2}$ -in.; *h*, Same, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by two species.

29. GENUS ENCALYPTA, *Schreb.*

WHOLE PLANT—Perennial, erect, caespitose, varying from $\frac{1}{2}$ inch to 2 inches in height, sometimes growing in extensive patches on calcareous soils, on walls, and rocks.

STEM—Tufted, branched, erect.

LEAVES—Spreading, or erect, more or less apiculate, lanceolate, or oblong, acute or obtuse; margin entire, plane, or reflexed; the upper part and middle of the areolæ are small, round; basal cells large and diaphanous; nerve strong.

INFLORESCENCE—Monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Oblong, with long paraphyses.

Fertile Flower (ARCHEGONIA)—With filiform paraphyses, few.

Vaginula—Oblong, of a purple colour.

Capsule—Erect, on a moderately long seta, striated on some species, smooth in others, cylindrical or oblong.

Calyptra—Large, covering the capsule, with long beak, entire or fringed, smooth or rough, persistent.

Operculum—Conical beak, rostrate.

Peristome—Present in some species, in others absent, with 16 erect, lanceolate, or filiform teeth.

Annulus—Simple, persistent.

Spores—Variable in size and appearance, smooth or granular.

GENERAL HABITAT—On rocks and walls on a calcareous soil, especially in the mountainous parts of England, Wales, Scotland, and Ireland. Fruit:—March, July, and August.

SPECIES ILLUSTRATED—*Encalypta vulgaris* (Hedw.) and *E. Rhabdocarpa* (Schw.) in part.

Reference to Plate—*a*, Plant, natural size, *E. vulgaris*: *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *bb*, Same, $\times 2$ -in.; *c*, Basal cells, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Calyptra, $\times 2$ -in.; *g*, Operculum, $\times 2$ -in. *ab*, Plant, natural size, *E. Rhabdocarpa*; *gg*, Capsule of same, $\times 2$ -in.; *h*, Front view of stem leaf, $\times 2$ -in.; *hh*, Back view of same, $\times 2$ -in.; *i*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by five species.

30. GENUS HEDWIGIA, *Ehrh.*

WHOLE PLANT—Perennial, growing in large patches, from 1 inch to 4 inches in height, erect, leafless near the root.

STEM—Irregularly and dichotomously branched.

LEAVES—Firm, crowded, spreading, ovato-lanceolate, concave, erect; margin recurved, at the base diaphanous; the apex, which is variable in length, strongly toothed, nerveless; areolæ quadrate, small in the middle and upper part; lower and basal cells elongated. *Perichæatial leaves*—Erect, toothed on both sides.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Numerous, axillary.

Fertile Flower (ARCHEGONIA)—Terminal, few, with rudimentary paraphyses.

Vaginula—Small.

Capsule—Globose, subsessile, immersed, reddish or reddish-brown.

Calyptra—Conical, small, smooth.

Operculum—Obtuse, plano-convex.

Peristome—Wanting.

Annulus—None.

Spores—Small.

GENERAL HABITAT—In mountainous situations, on the face of exposed rocks in Wales and Scotland. Fruit:—March.

SPECIES ILLUSTRATED—*Hedwigia ciliata* (Hedw.) and *Anætangium ciliatum* (H. & T.).

Reference to Plate—*a*, Plant, slightly magnified; *aa*, Same, $\times 2$ -in.; *b*, Stem-leaf, $\times 2$ -in.; *bb*, Perichæatial leaves, $\times 2$ -in.; *c*, Apex of same, $\times \frac{1}{4}$ -in.; *cc*, Apex of stem leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cells of Perichæatial leaf, $\times \frac{1}{4}$ -in.; *e*, Cellules of mid-leaf of same, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, operculum, $\times 1$ -in.; *g*, Cellules of stem mid-leaf, $\times \frac{1}{4}$ -in.; *gg*, Basal cells of stem leaf, $\times \frac{1}{4}$ -in.; *h*, ditto, $\times \frac{1}{4}$ -in.; *i*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

31. GENUS HEDWIGIDIUM, *Br. & Sch.*

WHOLE PLANT—Perennial, very similar in appearance to *Hedwigia*, and growing in extensive greenish patches on the face of rocks, varying from 1 inch to 3 inches in height.

STEM—Irregularly branched, slender, flagelliferous, very rarely dichotomous, *stoloniferous*.

LEAVES—Spreading, crowded, plicate, when dry closely imbricated, concave; margin somewhat recurved, ovato-lanceolate, acuminate, the apex crenulated; areolæ elongated; basal cells more elongated.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Numerous, terminal.

Fertile Flower (ARCHEGONIA).

Vaginula—Small and obscure.

Capsule—Obovate or spherical, on a short fruit stalk, about its own length, solitary, exserted, reddish-brown.

Calyptra—Cucullate, smooth, reddish.

Operculum—Conical, with a slightly oblique beak.

Peristome—Wanting.

Annulus—None.

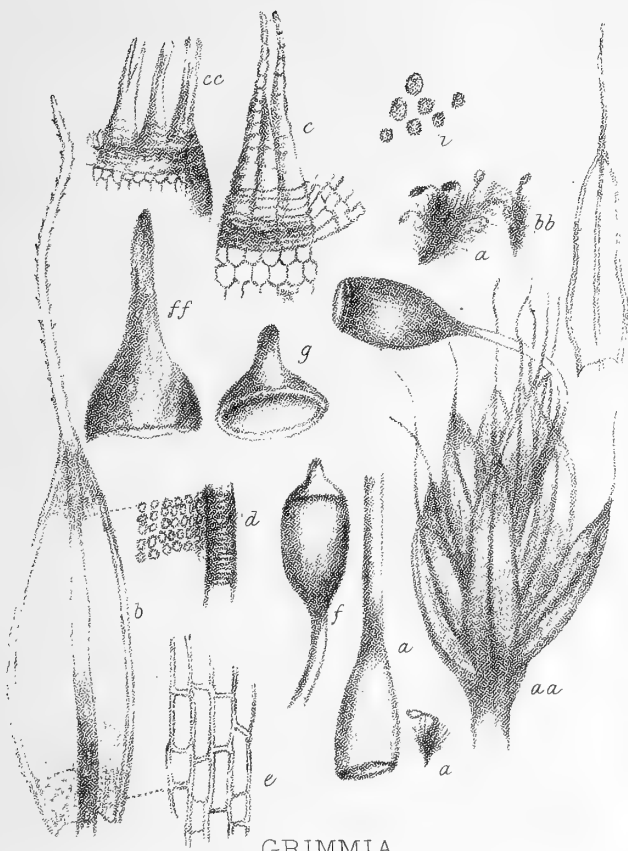
Spores—Small.

GENERAL HABITAT—On rocks, in Ireland and Wales. Fruit:—October and November.

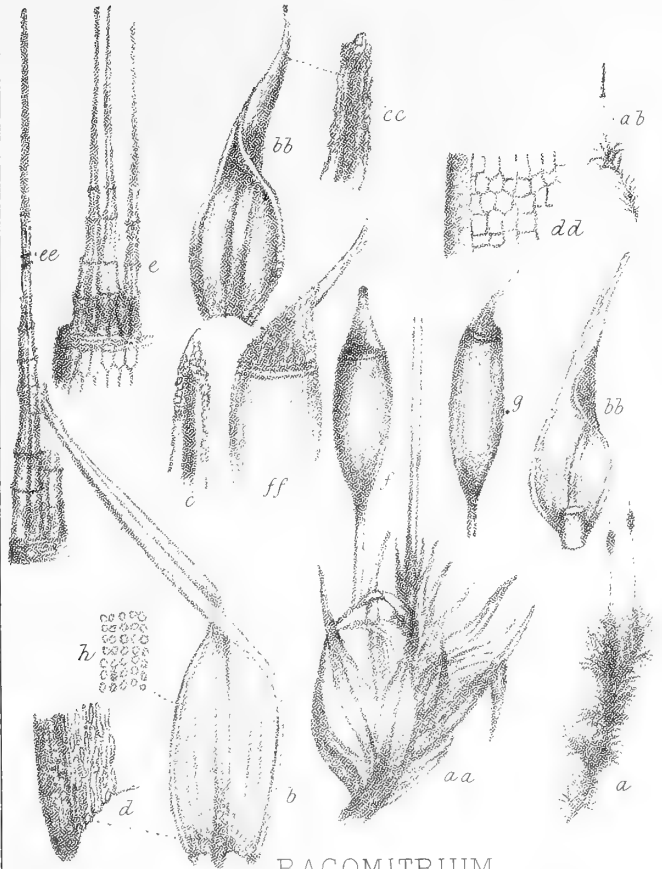
SPECIES ILLUSTRATED—*Hedwigidium imberbe* (Bruch. & Sch.), *Anætangium imberbe* (H. & T.), partly.

Reference to Plate—*a*, Plant, natural size; *aa*, Part of branch of same, $\times 2$ -in.; *b*, Branch leaves, $\times 2$ -in.; *bb*, Stem leaf, $\times 1$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{2}$ -in.; *e*, Basal cells, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Operculum, $\times 2$ -in.; *g*, Vaginula, $\times 2$ -in.; *h*, Perichæatial leaf, $\times 2$ -in.

This genus is represented in Britain by the species figured.



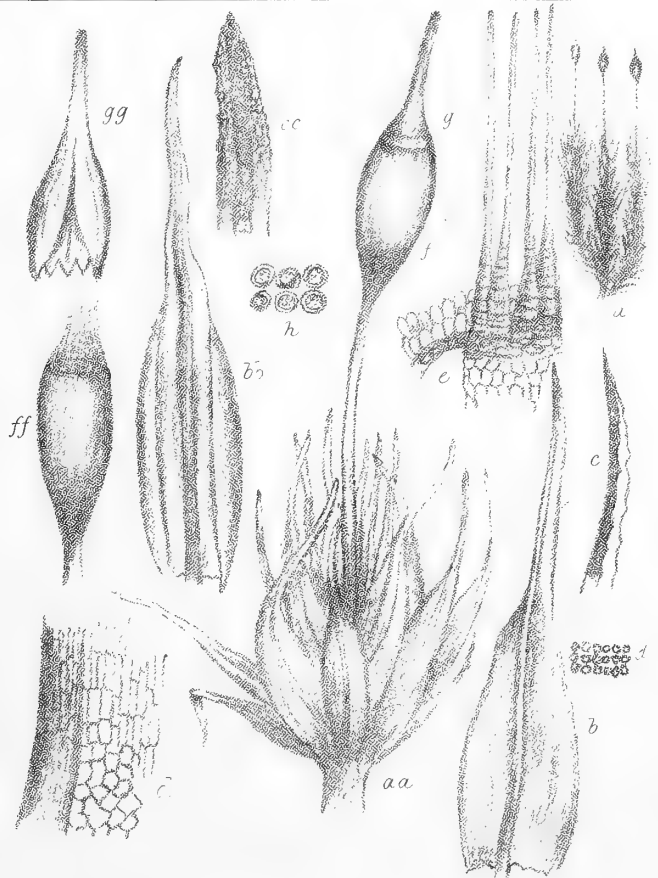
GRIMMIA



RACOMITRIUM.

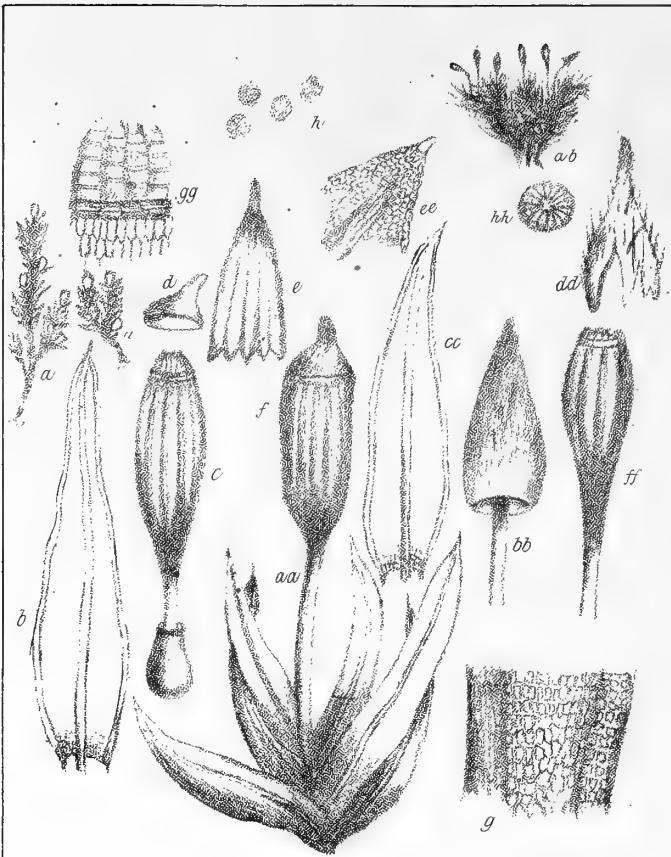


GLYPHOMITRIUM

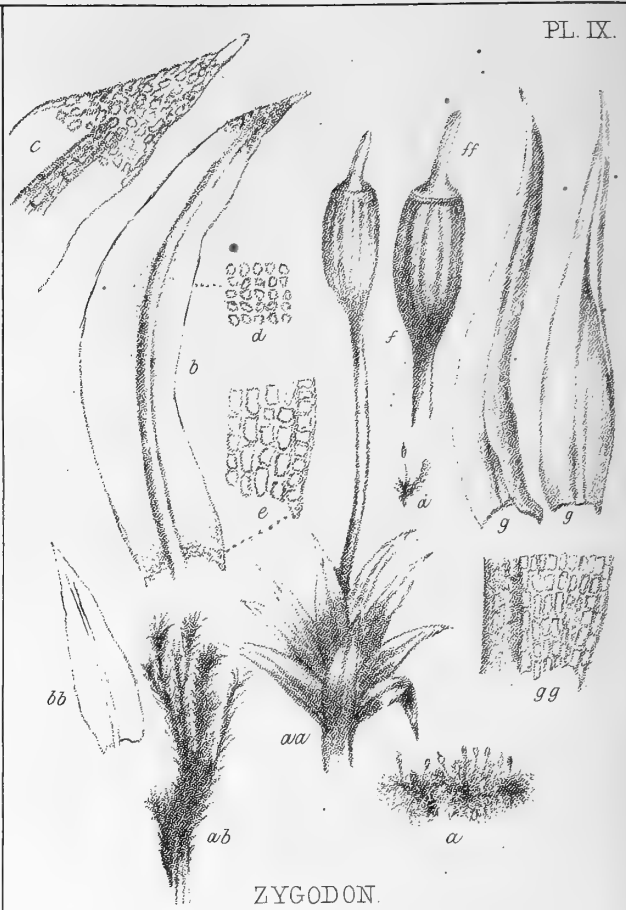


PTYCHOMITRIUM

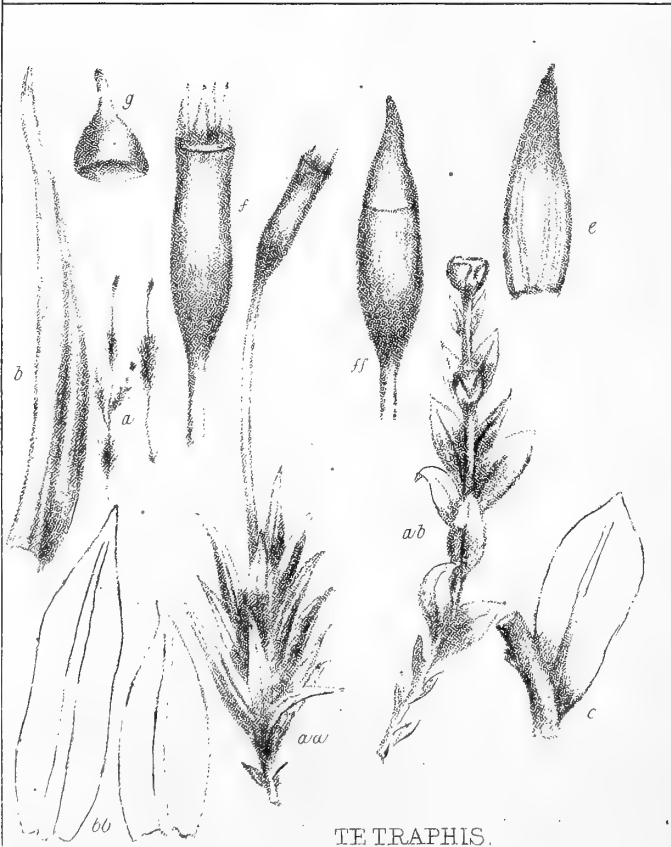




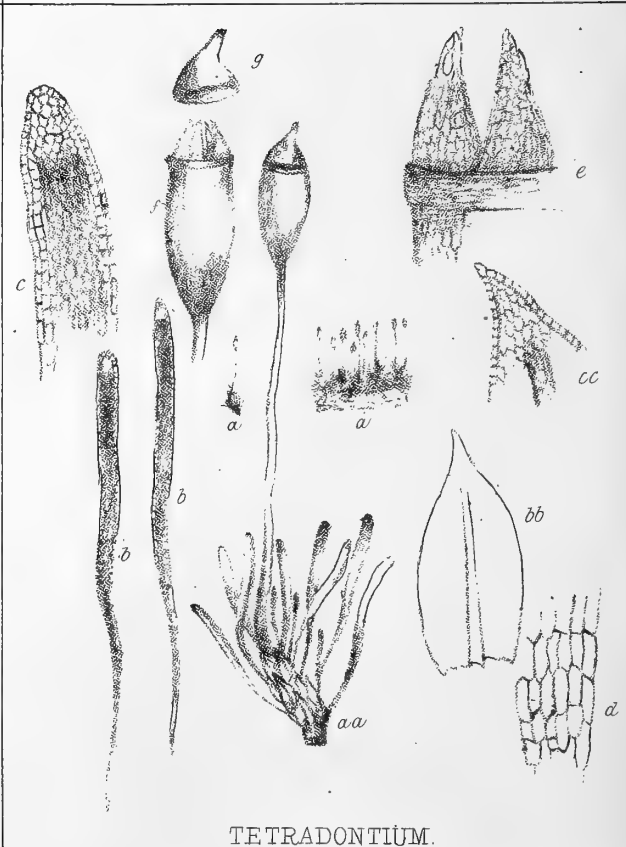
ORTHOTRICHUM.



ZYGODON.



TETRAPHIS.



TETRADONTIUM.

32. GENUS GRIMMIA, *Br. & Sch.*

WHOLE PLANT—Perennial, growing in rounded hoary tufts, or loosely on walls, rocks, and occasionally on trees from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches in height; foliage generally dark green.

STEM—Dichotomously branched, in some species erect, in others decumbent, with fastigate innovations.

LEAVES—Spreading, lanceolate, opaque, concave and channelled, when dry spiral, erect, imbricated, firm, having long silvery serrated hair points; margins recurved; nerve strong, reaching to the apex, vanishing below the silvery point; areolæ dot-like, dense in the middle, and upper part, large, and diaphanous at the base.

INFLORESCENCE—Monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Both lateral and terminal.

Fertile Flower (ARCHEGONIA)—Terminal.

Vaginula—Oblong or conical.

Capsule—Oval, obovate, elliptical, erect, or drooping, on a short or long seta, curved or upright, colour red to reddish-brown, when dry striated.

Calyptra—Mitriform, lobed, lacinated at the base.

Operculum—Conical, either long or short, rostrate or oblique, apiculate.

Peristome—Single, with 16 somewhat large lanceolate trabeculated teeth, red, purple, or brown.

Annulus—Either simple or compound.

Spores—Small, yellow.

GENERAL HABITAT—Rocks, in alpine situations, walls, roofs of buildings, occasionally on trees. Fruit:—March, April, May, and October.

SPECIES ILLUSTRATED—*Grimmia pulvinata* (Smith).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Branch leaf, $\times 1$ -in.; *bb*, Stem leaf, $\times 2$ -in.; *c*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *cc*, Same, $\times 1$ -in.; *d*, Cellules of mid-leaf, $\times \frac{1}{4}$ -in.; *e*, Basal cells $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Calyptra, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.; *h*, Vaginula, $\times 1$ -in.; *i*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by twenty-six species, according to Hobkirk, several species having been discovered since the publication of "Wilson's Bryologia Britannica."

33. GENUS RACOMITRIUM, *Br. & Sch.*

WHOLE PLANT—Perennial, fine tall mosses with terminal fruit, mostly growing on rocks, rarely on soil, from 1 inch to 4 inches in height, tufted; foliage light, or dull green, or blackish.

STEM—Decumbent, from 1 inch to 10 or more in length, dichotomously branched, irregular in some species, leafless at the base, slender, fragile.

LEAVES—Spreading, or erect, rigid, lanceolate, slightly secund, recurved, with silvery points similar to *Grimmia*, which many of the species resemble; areolæ dense, dot-like, small; basal cells elongated.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform, terminal.

Fertile Flower (ARCHEGONIA)—With short styles, gemmiform.

Vaginula—Cylindrical.

Capsule—Smooth, erect, elliptical, on a straight fruit stalk, narrow at the mouth.

Calyptra—Mitriform, having a round subulate beak.

Operculum—Conical, usually upright.

Peristome—With 16 bi-trifid filiform teeth, in some species very long, reddish.

Annulus—Large, dehiscent.

Spores—Small.

GENERAL HABITAT—On exposed moist rocks, and stones in mountainous situations. Fruit:—March and April.

SPECIES ILLUSTRATED—*Racomitrium canescens* (Bridel), and *R. fasciculare* (Bridel), in part.

Reference to Plate—*a*, Plant, natural size, *R. fasciculare*; *bb*, Stem leaves, $\times 2$ -in.; *cc*, Apex of Same, $\times \frac{1}{4}$ -in.; *dd*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times \frac{1}{2}$ -in.; *ee*, Same, $\times \frac{1}{4}$ -in.; *ff*, Capsule $\times 1$ -in.; *g*, Capsule, $\times 2$ -in. *ab*, Plant natural size, *R. canescens*; *b*, Stem leaf, $\times 2$ -in. of same; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *h*, Mid-leaf cellules, $\times 1$ -in.

This genus is represented in Britain by ten species.

34. GENUS GLYPHOMITRIUM, *Schw.*

WHOLE PLANT—Perennial, dwarf, densely tufted, with terminal fruit; foliage dark green, in the crevices of rocks.

STEM—Very leafy, scarcely branched.

LEAVES—Lanceolate, spreading, keeled, opaque, firm, crisped when dry, slightly thickened at the margin; nerve strong, reaching to the apex; areolæ dot-like, cellules larger at the base. *Perichaetial leaves* larger.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA)—Terminal.

Vaginula—

Capsule—Globose, erect, on a short fruit stalk, reddish-brown, firm, and smooth.

Calyptra—Large, covering the capsule to the base, plicated.

Peristome—Single, with 16 plain broad lanceolate red teeth, in pairs.

Annulus—Indistinct.

Spores—Large.

GENERAL HABITAT—Frequently growing near the sea in crevices of rocks in Ireland, Scotland, and Wales. Fruit:—June and July.

SPECIES ILLUSTRATED—*Glyphomitrium Daviesii* (Schw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *bb*, Stem leaf, $\times 1$ -in.; *c*, Apex of same, $\times \frac{1}{4}$ -in.; *e*, Calyptra, $\times 2$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, Operculum, $\times 2$ -in.; *h*, Mid-leaf cellules, $\times \frac{1}{4}$ -in.; *hh*, Basal cellules, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

35. GENUS PTYCHOMITRIUM, *Br. & Sch.*

WHOLE PLANT—Perennial, densely caespitose, on rocks that are exposed, and on the ground, never on trees; foliage dark green, from 1 inch to 2 inches in height.

STEM—Branched dichotomously upwards.

LEAVES—Lanceolate, concave, in eight rows, nerved to the apex, which is toothed; areolæ dot-like in the middle and upper part of basal cellules, elongated and hexagonal.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform, axillary, elongated.

Fertile Flower (ARCHEGONIA)—Small paraphyses, filiform.

Vaginula—"With a *tubus vaginulus*," Wilson.

Capsule—Erect, terminal, elliptical, on a moderately long fruit stalk, pale brown.

Calyptra—Mitriform, furrowed, lacinated at the base, plicate.

Operculum—Conical, with a long upright beak.

Peristome—Single, teeth 16, bifid, long, erect, filiform, coloured.

Annulus—Compound.

Spores—Small.

GENERAL HABITAT—In mountainous places on rocks, sometimes on walls. Fruit:—March and April.

SPECIES ILLUSTRATED—*Ptychomitrium polyphyllum* (Br. & Sch.), *Dicranum polyphyllum* (Smith).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *c*, Apex of same, $\times 1$ -in.; *bb*, Branch leaf, $\times 2$ -in.; *cc*, Apex of same, $\times \frac{1}{2}$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *dd*, Mid-leaf cellules, $\times 1$ -in.; *e*, Teeth of peristome, with portion of annulus, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Same, $\times 2$ -in.; *g*, Operculum, $\times 2$ -in.; *gg*, Calyptra, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

36. GENUS ORTHOTRICHUM, *Br. & Sch.*

WHOLE PLANT—Perennial, growing on stones and trees in tufts, from $\frac{1}{2}$ inch to $1\frac{1}{2}$ inches in height.

STEM—Erect, occasionally procumbent, branched.

LEAVES—Lanceolate, concave, rigid; margin recurved or revolute, when dry twisted, or curled; areolæ small, dot-like in the middle and upper parts of the leaf; basal cells larger, diaphanous, hexagonal.

INFLORESCENCE—Monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Oval, varying in number, with long paraphyses.

Fertile Flower (ARCHEGONIA)—Bud-like, few.

Vaginula—

Capsule—Erect, oval, cylindrical, or pear-shaped, having 8 or 16 strongly marked coloured striæ.

Calyptra—Campanulate, plicate, large, furrowed; base lacinated, frequently covered with straight hairs.

Operculum—Conical, short.

Peristome—Single or double, composed of apparently 8 teeth, but really consisting of 32 very closely connected teeth.

Annulus—None.

Spores—Small, yellow.

GENERAL HABITAT—On rocks, walls, rails, and trees. Fruit:—Spring and summer.

SPECIES ILLUSTRATED—*Orthotrichum affine* (Schrad.), in part, *O. Saxatile* (Bridel), and *O. Bruchii* (Bridel), in part.

Reference to Plate—*a*, Plant, natural size, *O. affine*; *b*, Stem leaf of same, $\times 2$ -in.; *c*, Capsule of same, $\times 2$ -in.; *d*, Operculum, $\times 2$ -in.; *e*, Calyptra, $\times 2$ -in.; *f*, Capsule, $\times 2$ -in. *O. Saxatile*, Portion of plant of same, $\times 2$ -in.; *bb*, Calyptra, $\times 2$ -in.; *cc*, Stem leaf, $\times 2$ -in.; *ee*, Apex of leaf, $\times 1$ -in.; *g*, Basal cells, $\times 1$ -in. *ab*, Plant natural size, *O. Bruchii*; *ff*, Capsule, $\times 2$ -in.; *dd*, Calyptra, $\times 2$ -in.; *gg*, Teeth of peristome, $\times \frac{1}{2}$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *hh*, Mouth of peristome, $\times 2$ -in.

This genus is represented in Britain by twenty-nine species, according to Hobkirk.

37. GENUS ZYGODON, *Hook. & Tayl.*

WHOLE PLANT—Perennial, growing in patches or tufts; foliage bright green, covered with radicles, from $\frac{1}{2}$ an inch to $1\frac{1}{2}$ inches in height.

STEM—Having fastigiata branches.

LEAVES—Spreading, lanceolate, carinate, with plane margin, the nerve reaching nearly to the apex; areolæ small, dot-like in the middle and upper portion of the leaf; basal cells more elongated.

INFLORESCENCE—Monoicous, dioicous, and synoicous.

Barren Flower (ANTHERIDIA)—Gemmiform, terminal.

Fertile Flower (ARCHEGONIA)—Same paraphyses when present, filiform.

Vaginula—

Capsule—Pear-shaped, erect, usually with 8 striæ, on a straight fruit stalk.

Calyptra—Cucullate, small, smooth, brown.

Operculum—Flattish, beak long.

Peristome—Present in some species, absent in others, when present having 8 inner and 8 outer teeth.

Annulus—Indistinct.

Spores—Smooth, small.

GENERAL HABITAT—On rocks in Alpine situations and trunks of trees. Fruit:—Spring and summer.

SPECIES ILLUSTRATED—*Zygodon viridissimus* (Brid.), *Gymnostomum viridissimum* (H. & T.), and partly *Z. Mougeottii*.

Reference to Plate—*a*, Plant, natural size, *viridissimus*; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *c*, Apex of same, $\times \frac{1}{4}$ -in.; *e*, Basal cellules of same, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Operculum, $\times 1$ -in.; *ab*, Plant natural size, *Z. Mougeottii*; *g*, Leaf of same, $\times 2$ -in.; *gg*, Basal cellules of same, $\times \frac{1}{4}$ -in.

This genus is represented in Britain and Ireland by six species, according to Hobkirk.

38. GENUS TETRAPHIS, *Hedw.*

WHOLE PLANT—Perennial, bright green above, reddish-brown below, from $\frac{1}{4}$ inch to 1 inch in height.

STEM—Slender, erect.

LEAVES—Upper ones lanceolate, light green, on the fertile stem; lower leaves ovate, lanceolate, reddish-brown, with a plane entire margin, nerve ceasing below the apex; areolæ pellucid, dot-like; leaves on the barren stem broadly obcordate.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Terminal, gemmiform, with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Few.

Vaginula—Oblong.

Capsule—Erect, elliptical, on a long fruit stalk, terminal, solitary, reddish-brown, mouth having a bright red border.

Calyptra—Mitriform, plicate, torn at the base.

Operculum—Conical beak short.

Peristome—Simple, with 4 equally divided conical or pyramidal triquetrous teeth, having longitudinal lines.

Annulus—None.

Spores—Rather small, smooth, yellow.

GENERAL HABITAT—On a peaty soil in shady places and decaying stumps of trees. Fruit:—September.

SPECIES ILLUSTRATED—*Tetraphis pellucida* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *ab*, Same, $\times 2$ -in.; *b*, Leaf of same, $\times 2$ -in.; *bb*, upper stem leaves $\times 2$ -in.; *c*, Branch leaf, $\times 2$ -in.; *e*, Calyptra, $\times 2$ -in.; *f*, Capsule with teeth of peristome, $\times 1$ -in.; *ff*, Capsule with calyptra, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.

This genus is represented in Britain by the species figured.

39. GENUS TETRADONTIUM, *Schwaeg.*

WHOLE PLANT—Annual, or biennial, gregarious, minute.

STEM—Scarcely any, or none.

LEAVES—Ovate, lanceolate, concave, imbricated; areolæ oval in the centre and upper portion of the leaf; basal cells elongated; nerves ceasing below the apex; radical leaves long, linear, clavate, flattish, thickened upwards, entire, formed of layers of cellules, nerve nearly the width of the leaf, brown.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Small.

Fertile Flower (ARCHEGONIA).

Vaginula—Cylindrical.

Capsule—Oval, oblong, solitary, erect, on a long upright pedicel, light brown.

Calyptra—Large, plicate, mitriform.

Operculum—Conical, beak short, acute.

Peristome—Same as *Tetraphis*, with shorter teeth.

Annulus—None.

Spores—Small, smooth, yellow.

GENERAL HABITAT—On sandstone and on rocks. Fruit:—July.

SPECIES ILLUSTRATED—*Tetradontium Brownianum* (Dicks.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Root-leaves, $\times 1$ -in.; *c*, Apex of same, $\times \frac{1}{4}$ -in.; *bb*, Stem leaf, $\times 1$ -in.; *cc*, Apex of same, $\times \frac{1}{4}$ -in.; *d*, Basal cellules of same, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.

This genus is represented in Britain by the species figured.

40. GENUS BUXBAUMIA, *Haller.*

WHOLE PLANT—Annual or biennial, resembling a fungus, stemless, partially concealed in the soil, from $\frac{1}{2}$ an inch to 1 inch in height.

LEAVES—Lanceolate, irregularly and deeply toothed, few; areolæ, oblong, large, surrounded with long filiform rooting fibres, nerveless, reddish.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform, solitary.

Fertile Flower (ARCHEGONIA).

Vaginula—Ovate.

Capsule—Large, oblique, ovate, flat at top, with a raised border, convex, and swelling beneath, reddish-brown.

Calyptra—Small, obtuse.

Operculum—Conical, obtuse, small.

Peristome—"According to Bruch and Schimper double, outer one divided into irregular moniliform reddish teeth, inner peristome pale whitish" (Wilson).

Annulus—None.

Spores—Small.

GENERAL HABITAT—"On soil or decaying wood." Yorkshire, Scotland. Rare. Fruit:—May.

SPECIES ILLUSTRATED—*Buxbaumia aphylla* (Haller).

Reference to Plate—*a*, Plant, natural size; *b*, Radical leaves, $\times 1$ -in.; *c*, Capsule, $\times 2$ -in.; *d*, Lateral view of same, $\times 2$ -in.; *e*, Stem leaf, $\times 1$ -in.; *f*, Operculum, $\times 2$ -in.

This genus is represented in Britain by the species figured.

41. GENUS DIPHYSCIUM, *Weber & Mohr.*

WHOLE PLANT—Small, resembling in appearance *Phascum cuspidatum*, gregarious.

STEM—If any, very short.

LEAVES—Linear or ligulate, entire; nerve reddish, ceasing below the apex; areolæ opaque *Perichætal leaves*—Lanceolate, structure and shape different, much larger; nerve strong, excurrent, reaching into a long serrated bristly point; areolæ dot-like in the upper part, cellules at the base, quadrate, diaphanous.

INFLORESCENCE—"Dioicous" (Wilson), "Monoicous" (Br. & Sch.).

Barren Flower (ANTHERIDIA)—Gemmiform, numerous.

Fertile Flower (ARCHEGONIA)—Gemmiform, few.

Vaginula—

Capsule—Ovate, large, sessile, immersed.

Calyptra—Mitriform.

Operculum—Conical.

Annulus—"Small."

Spores—"Very small."

GENERAL HABITAT—Mountainous situations, on moist rocks, sometimes mixed with *Jungermannia dilatata*.

SPECIES ILLUSTRATED—*Diphyscium foliosum* (Weber and Mohr.). Fruit :—August.

Reference to Plate—*a*, Plant, natural size; *aa*, Slightly magnified; *b*, Stem leaf, $\times 2$ -in.; *bb*, Branch leaf, $\times 2$ -in.; *c*, Perichætal leaf, $\times 2$ -in.; *d*, Apex of same, $\times 1$ -in.; *e*, Basal cells, of same, $\times 1$ -in.

This genus is represented in Britain by the species figured.

42. GENUS ATRICHUM, *P. Beauv.*

WHOLE PLANT—Perennial, erect, growing on soil, from 1 inch to 2 inches in height.

STEM—Leafy; rarely branched.

LEAVES—Lanceolate, undulated; margin thick, reddish, with spinose teeth, reddish; nerve reddish, reaching to the apex areolæ dense, roundish, or hexagonal under high power.

INFLORESCENCE—Monoicous and dioicous.

Barren Flower (ANTHERIDIA)—Oblong, terminal, cup-shaped, having filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Terminal, slender, few.

Vaginula—Oblong.

Capsule—Cylindrical, erect, or cernuous, on a long fruit stalk, solitary, reddish-brown.

Calyptra—Cucullate, narrow.

Operculum—Hemispherical, beak curved, long and slender, as long as the capsule.

Peristome—Single, with 32 yellowish, short, obtuse, rigid teeth, somewhat incurved, of fibrous texture, united at the base.

Annulus—None.

Spores—Small.

GENERAL HABITAT—On clayey soil in woods, on heaths and bare sandy places. Fruit :—Autumn and Winter.

SPECIES ILLUSTRATED—*Atrichum undulatum* (P. Beauv.), *Polytrichum undulatum* (Hedw.), and *Bryum undulatum* (Linn.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaves, $\times 2$ -in.; *c*, Apex of leaf, $\times 2$ -in.; *d*, Portion of mid-leaf, $\times 1$ -in.; *e*, Teeth of Peristome, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Operculum, $\times 2$ -in.; *g*, Cellules of leaf, $\times \frac{1}{2}$ -in.

This genus is represented in Britain by four species, according to Hobkirk.

43. GENUS OLIGOTRICHUM, *De Cand.*

WHOLE PLANT—Perennial, erect, not unlike *Atrichum*, but more rigid, from 1 inch to $1\frac{1}{2}$ inches in height.

STEM—Leafy; like *Atrichum*, not branched.

LEAVES—Lanceolate, inflexed, slightly crenulate near the apex; nerve broad, prominent, with undulated or wavy lamellæ; areolæ small, round.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Slender, fusiform, paraphyses filiform.

Fertile Flower (ARCHEGONIA)—

Vaginula—

Capsule—Erect, ovate, subcylindrical, reddish, solitary.

Calyptra—Cucullate.

Operculum—Conical, short.

Peristome—Single, with 32 teeth, very similar in shape and texture to *Atrichum*, but larger, colour pale-yellow.

Annulus—None.

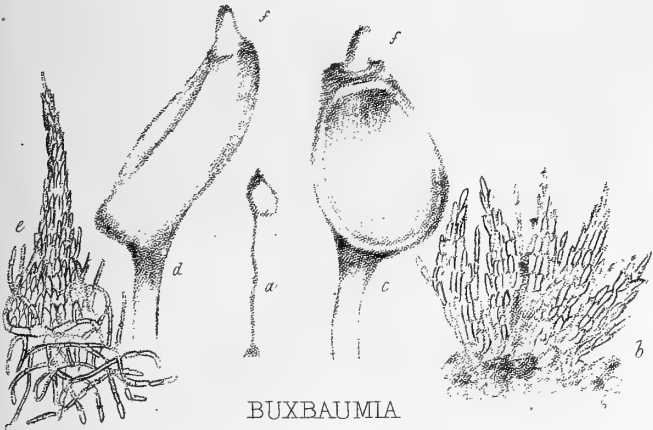
Spores—Small, yellow.

GENERAL HABITAT—On barren soil, in Alpine situations. Scotland and Wales. Fruit :—July.

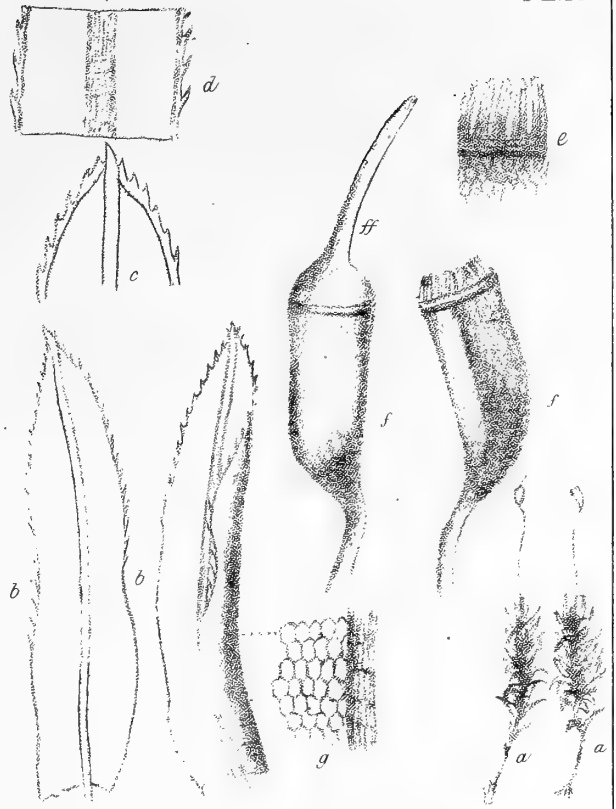
SPECIES ILLUSTRATED—*Oligotrichum hercynicum* (De Cand.), and *Polytrichum hercynicum* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *bb*, Portion of branch and leaves, $\times 2$ -in.; *c*, Apex of leaf, $\times 1$ -in.; *d*, Base of same, $\times 1$ -in.; *e*, Cellules of same, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 2$ -in.; *cc*, Teeth of peristome, $\times \frac{1}{2}$ -in.; *h*, Spores, $\times \frac{1}{2}$ -in.

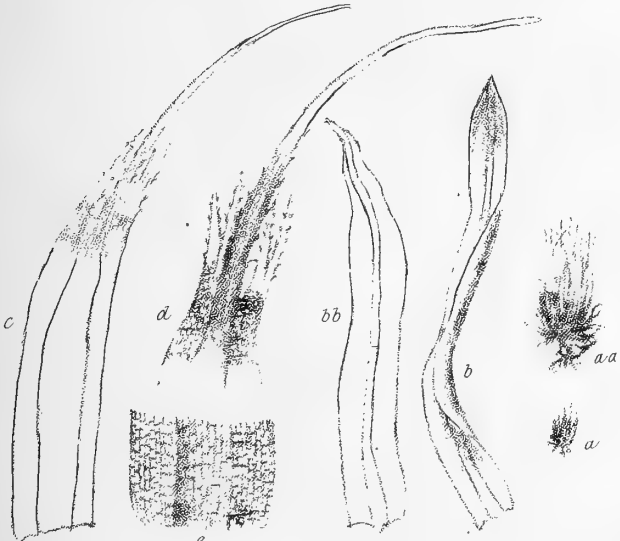
This genus is represented in Britain by the species figured.



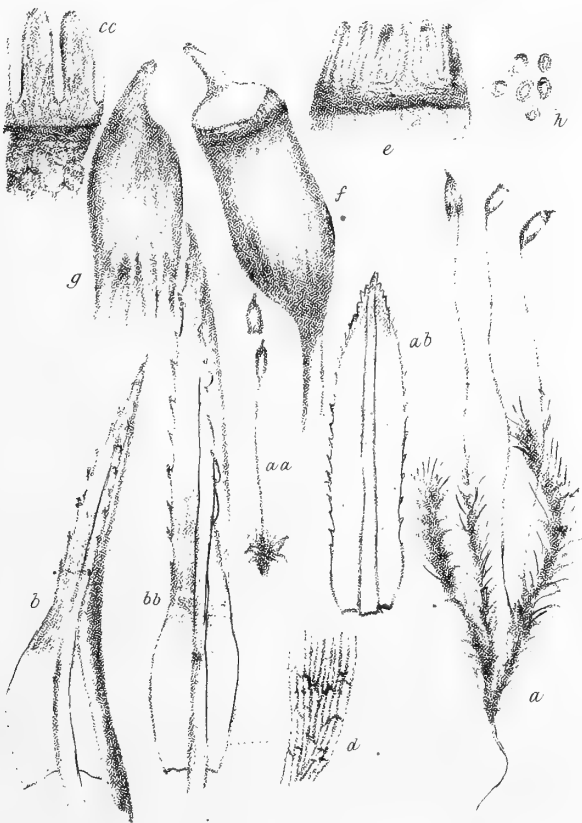
BUXBAUMIA



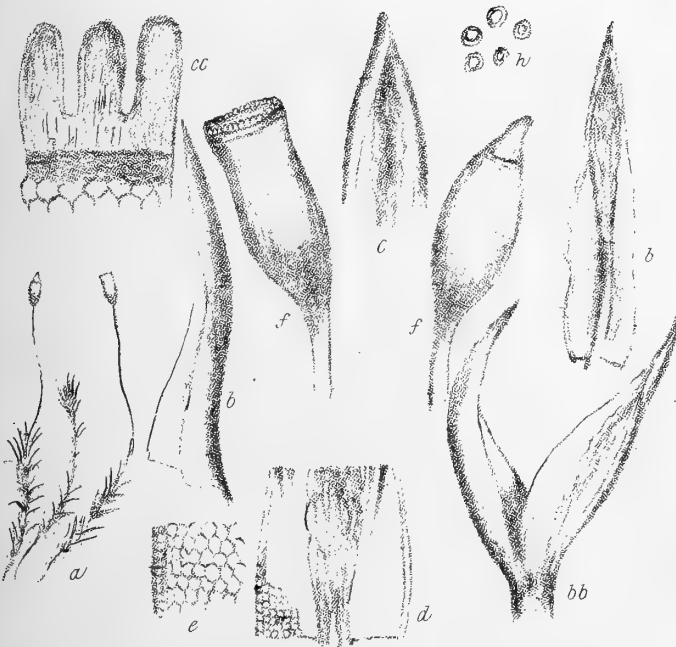
ATRICHUM



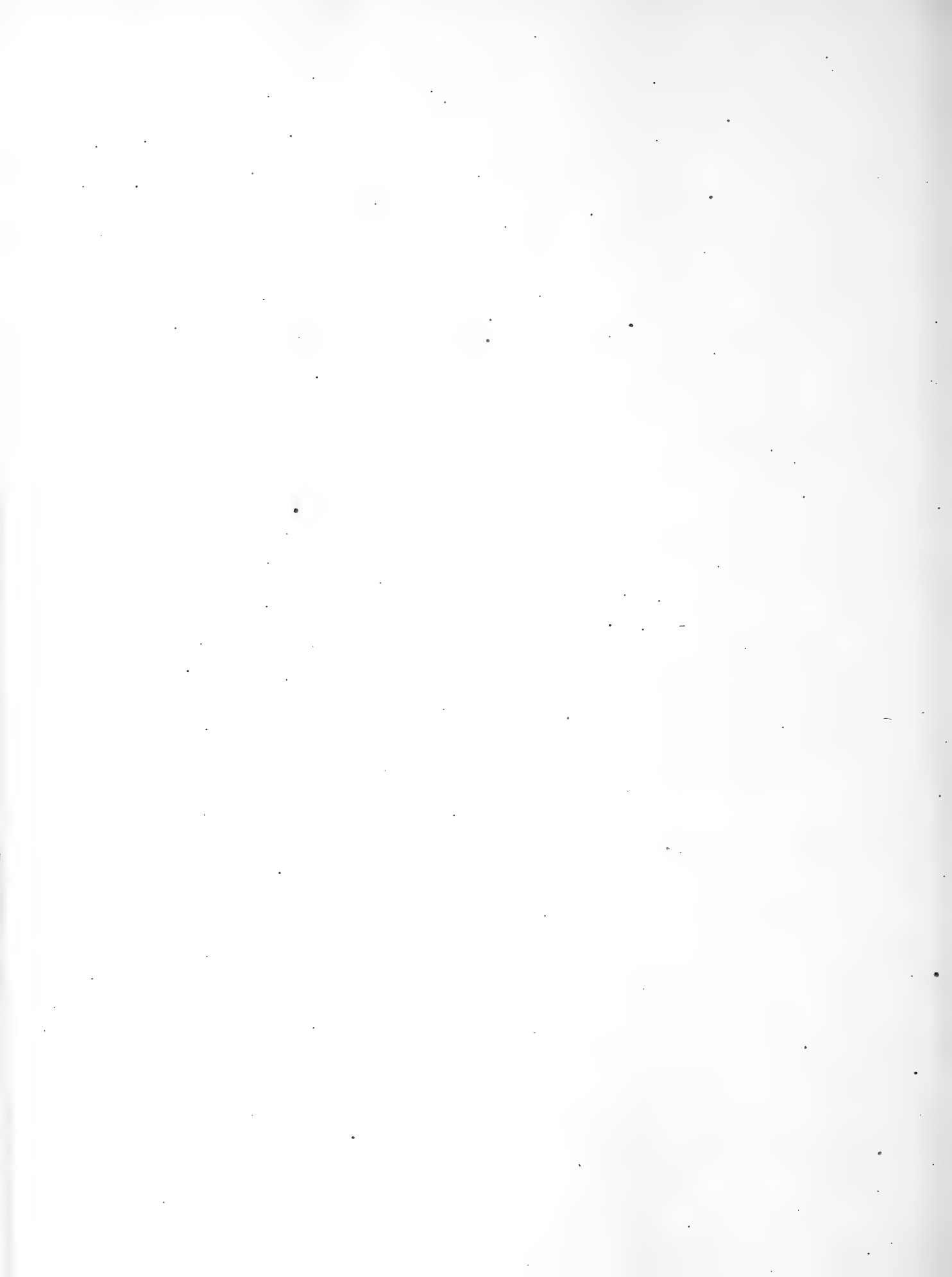
DIPHYSCIUM

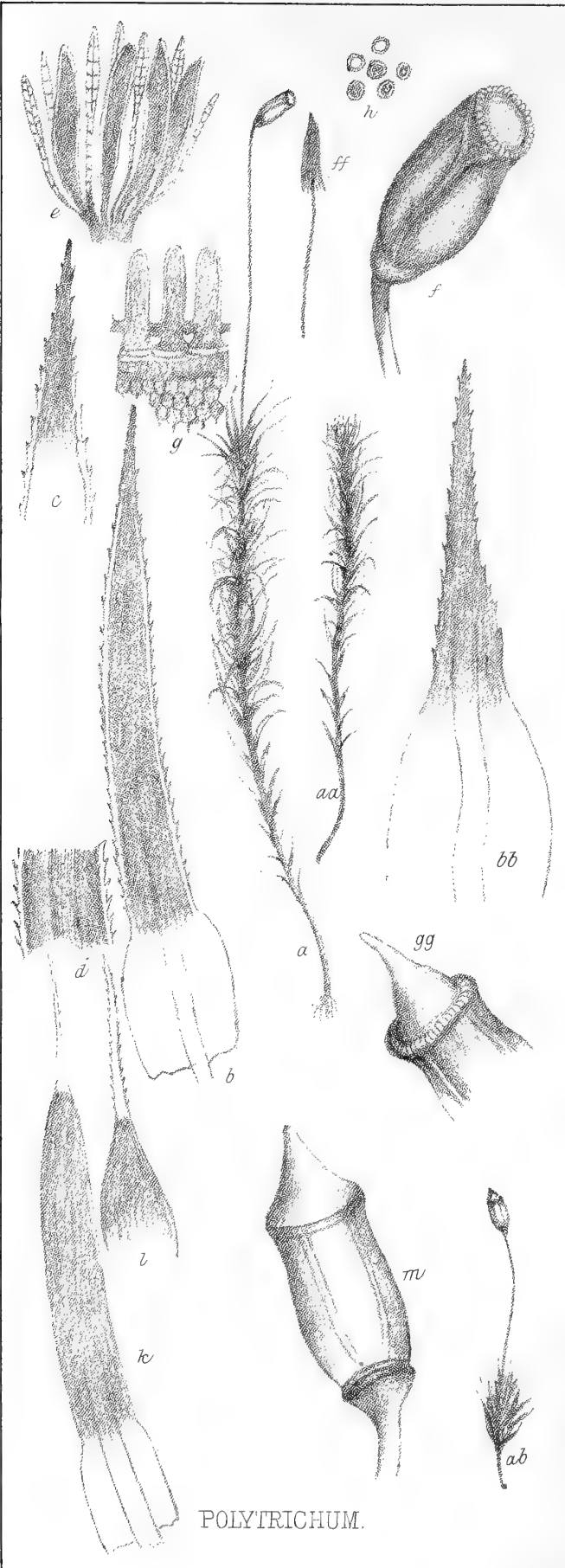


POGONATUM

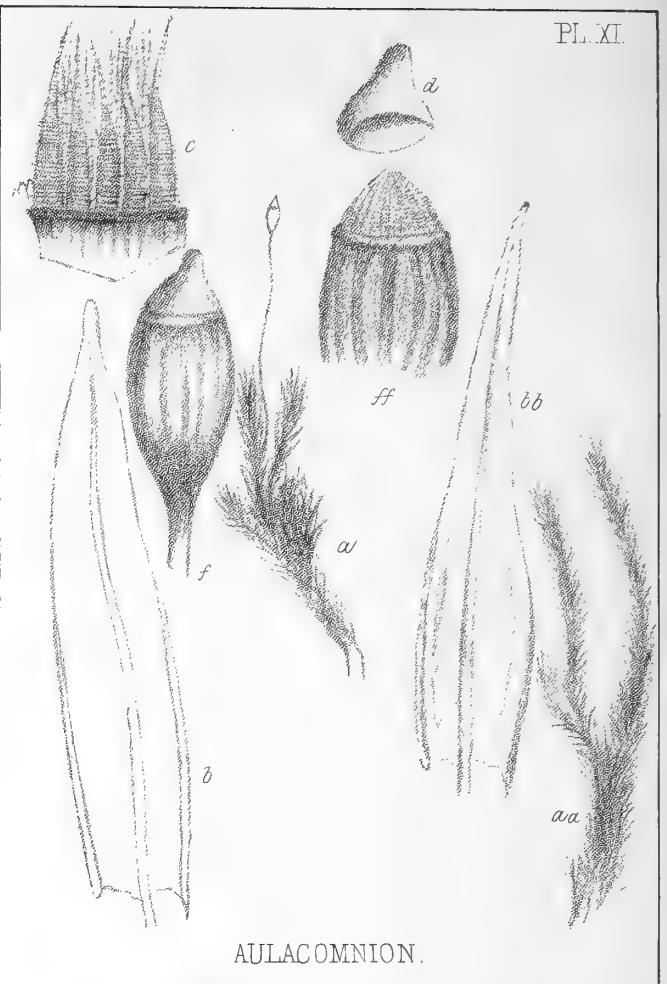


OLIGOTRICHUM

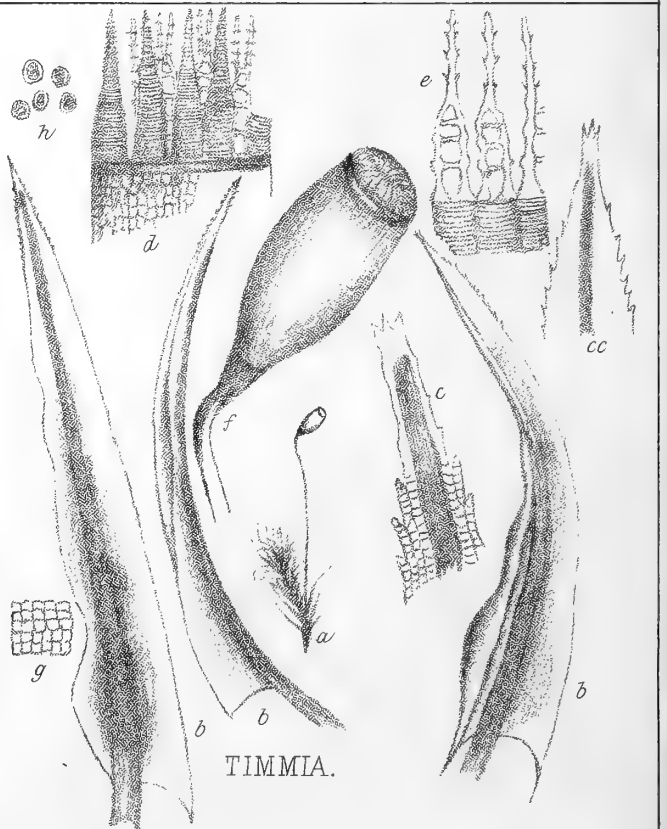




POLYTRICHUM.



AULACOMNION.



TIMMIA.

44. GENUS POGONATUM, *P. Beauv.*

WHOLE PLANT—Perennial, tall strong plants, closely allied to *Polytrichum*, from $\frac{1}{4}$ of an inch to 4 inches in height.

STEM—Simple, sometimes branched.

LEAVES—Lanceolate, very rigid, sheathing, spreading, erect when dry, glaucous or reddish-brown; margin more or less serrated; nerve strong and broad; areolation dense in the middle and upper part of the leaf, basal cellules elongated.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Slender, with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—

Vaginula—Membranous.

Capsule—Oblong, erect, or slightly oblique, of firm texture, reddish-brown.

Calyptra—Convex, beak slightly curved.

Operculum—Covered with hairs, cucullate.

Peristome—Similar to *Atrichum* and *Oligotrichum*.

Annulus—

Spores—Yellow, small.

GENERAL HABITAT—Sandy and moist banks, sides of streams on elevated situations. Fruit:—October and November.

SPECIES ILLUSTRATED—*Pogonatum urnigerum* (Bridel), *Polytrichum urnigerum* (Linn.), and *P. aloides* (Bridel), in part.

Reference to Plate—*a*, Plant, natural size, *P. urnigerum*; *b*, Stem leaf of same, $\times 2$ -in.; *bb*, Branch leaf, $\times 2$ -in.; *d*, Basal cellules of branch leaf, $\times \frac{1}{4}$ -in.; *cc*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *e*, Same, $\times 1$ -in.; *f*, Capsule $\times 2$ -in.; *g*, Calyptra, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{2}$ -in. *aa*, Plant natural size, *P. aloides*; *ab*, Stem leaf of same, $\times 2$ -in.

This genus is represented in Britain by four species.

45. GENUS POLYTRICHUM, *Bridel.*

WHOLE PLANT—Perennial, fine tall plants, the most elegant, showy, and conspicuous of the family of Mosses, some species reaching from 6 inches to 8 inches in height, affecting moist woods and dry heaths.

STEM—Simple, triangular, firm, erect, reddish or dark purple, of a woody texture.

LEAVES—Lanceolate, sharply serrated, dark green in the middle and upper portion of the leaf, with the areolation dense, yellow or reddish at the base; nerve broad, ceasing below the apex, or extending into a white serrated point.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Lanceolate, surrounded with paraphyses.

Fertile Flower (ARCHEGONIA)—Paraphyses filiform.

Vaginula—

Capsule—Angular, erect, or oblique, yellowish or chestnut-brown.

Calyptra—Cucullate, covered with whitish or reddish hairs, lacerated at the base, in some cases covering the whole capsule.

Operculum—Conical, beak erect or oblique, having a convex base.

Peristome—Consisting of 64 teeth, closely resembling in form and structure those of *Atrichum* and *Pogonatum*.

Annulus—

Spores—Small, yellowish-green.

GENERAL HABITAT—Woods, heaths, and mountainous situations. Fruit:—June and September.

SPECIES ILLUSTRATED—*Polytrichum commune* (Linn.) and *P. piliferum* (Schreb.), in part.

Reference to Plate—*a*, Plant, natural size, *P. commune*; *aa*, Male plant same; *b*, Stem leaf, $\times 2$ -in.; *bb*, Perichæstrial leaf, $\times 2$ -in.; *c*, Apex of stem leaf, $\times 1$ -in.; *d*, Portion of mid-leaf, $\times 1$ -in.; *e*, Antheridia and paraphyses, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Calyptra, natural size; *g*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *gg*, Portion of capsule with operculum, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{2}$ -in. *ab*, Plant, natural size of *P. piliferum*; *m*, Capsule, $\times 2$ -in.; *k*, Stem leaf, $\times 2$ -in.; *l*, Apex of leaf, $\times 1$ -in.

This genus is represented in Britain by seven species, according to Hobkirk. Wilson gives six.

46. GENUS TIMMIA, *Hedw.*

WHOLE PLANT—Perennial, growing in reddish-brown tufts, from 1 inch to 2 inches in height.

STEM—Leafy, caespitose with innovations.

LEAVES—Linear-lanceolate, sheathing at the base, spreading or crowded, apex serrated; nerve strong and prominent, ceasing below the apex; areolæ quadrate, small, opaque, upper leaves yellowish-green, lower ones reddish-brown.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—“Gemmiform.”

Fertile Flower (ARCHEGONIA)—“With long styles, paraphyses filiform.”

Vaginula—

Capsule—Oblong, inclined.

Calyptra—“Cuculliform, rather large.”

Operculum—“Convex.”

Peristome—Double, with 16 outer teeth, inner teeth transparent, divided half way with appendiculate cilia.

Annulus—

Spores—Small, yellow.

GENERAL HABITAT—On rocks, exceedingly rare. Fruit:—“Summer.”

SPECIES ILLUSTRATED—*Timmia megapolitana* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *b*, Leaves, $\times 2$ -in.; *c*, Apex of same, $\times \frac{1}{2}$ -in.; *cc*, Same, $\times 1$ -in.; *d*, Outer and inner teeth of peristome, 1-in.; *e*, Inner teeth of peristome, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Cellules of mid-leaf, $\times \frac{1}{2}$ -in.; *h*, Spores, $\times \frac{1}{2}$ -in.

This genus is represented in Britain by two species—*T. austriaca*, discovered in Forfarshire in 1824 by Mr. Thomas Drummond, barren; *T. megapolitana*, by Dr. Stirton, on Ben Lawers, in 1866, barren.

The specimen from which the figures are drawn was kindly given me by Dr. Braithwaite, and came from the Carpathian Mountains, those in my possession, collected by Dr. Stirton, and given to me by James Hardy, Esq., of Old Cambus, being without fruit.

47. GENUS AULACOMNION, *Schwægr.*

WHOLE PLANT—Perennial, frequenting boggy and marshy places and moist places in woods, caespitose branched, from $\frac{1}{2}$ an inch to 4 inches in height, pale green or yellowish-brown.

STEM—Slender, more or less branched, having numerous reddish radicles.

LEAVES—Lanceolate, obovate, obtuse, entire, crowded or spreading; margin revolute, serrate at the apex; nerve ceasing below the apex; areolæ round, dot-like.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Discoid or gemmiform, terminal or axillary, oblong.

Fertile Flower (ARCHEGONIA)—Terminal.

Vaginula—Oblong.

Capsule—Cernuous, somewhat inclined, ovate or oblong, striate, reddish-brown, fruit stalk solitary, red.

Calyptra—Cucullate, small.

Operculum—Conical, rostellate.

Peristome—With 16 yellow-brown teeth, equidistant, with narrow crowded transverse bars; inner teeth pellucid, divided in the middle, and exhibiting 16 processes alternately.

Annulus—"Compound."

Spores—Round, small, yellowish.

GENERAL HABITAT—Boggy heaths, marshes, and moist sandy places in woods. Fruit:—May and June.

SPECIES ILLUSTRATED—Aulacomnion palustre (Schwægr).

Reference to Plate—*a*, Fertile plant, natural size; *aa*, Barren plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *bb*, Branch leaf, $\times 2$ -in.; *c*, Teeth of peristome, $\times 1$ -in.; *d*, Operculum, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Portion of same, $\times 1$ -in.

This genus is represented in Britain by two species.

48. GENUS ORTHODONTIUM, *Schw.*

WHOLE PLANT—Perennial, beautiful slender plants growing on rocks in bright green tufts with terminal fruit.

STEM—Slender, fragile, branched.

LEAVES—Long, linear, setaceous, crowded, or spreading; margin plane; nerve faint, ceasing below the apex; areolæ lax, narrow, oblong.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Numerous, gemmiform, with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Few, with filiform paraphyses.

Vaginula—Cylindrical.

Capsule—Somewhat inclined, clavate, of thin texture, gradually tapering into the pale red curved fruit stalk; cellules lax, yellowish-green.

Calyptra—Cucullate, small.

Operculum—Conical, beaked.

Peristome—Double, with 16 outer teeth, erect, very similar to *Bryum*; teeth of the inner peristome alternate, resembling in form the outer ones, pellucid.

Annulus—"Rudimentary."

Spores—Yellow, small.

GENERAL HABITAT—Sandstone rocks, Cheshire, Yorkshire, Sussex. Fruit:—March.

SPECIES ILLUSTRATED—Orthodontium gracile (Schwægr), Bryum gracile (Wilson), in Eng. Flor. t. 2835.

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *bb*, Same, $\times 2$ -in.; *c*, Basal cells of leaf, $\times \frac{1}{2}$ -in.; *d*, Operculum, $\times 1$ -in.; *e*, Vaginula, $\times 1$ -in.; *f*, Portion of capsule, showing the columella, $\times 1$ -in.; Teeth of peristome, $\times \frac{1}{2}$ -in.

This genus is represented in Britain by the species figured.

49. GENUS LEPTOBRYUM, *Wilson.*

WHOLE PLANT—Annual, growing in patches, fruit terminal, about 1 inch in height, colour bright green, slender, delicate looking plants.

STEM—Simple or slightly branched.

LEAVES—Narrow, setaceous, spreading, upper ones slightly serrated near the apex; nerve very broad, ceasing below the apex; areolæ narrow, oblong, bright green.

INFLORESCENCE—Synoicous.

Barren Flower (ANTHERIDIA)—Subcylindrical, paraphyses filiform, gemmiform.

Fertile Flower (ARCHEGONIA)—"With filiform paraphyses."

Vaginula—Oblong.

Capsule—Pendulous, pyriform, having a tapering neck, texture thin, bright orange colour, fruit stalk slender, same colour as the capsule.

Calyptra—Small, cucullate.

Operculum—Convex.

Peristome—Double, with 16 outer teeth, reddish, transversely barred, having 16 inner teeth divided half way, alternate with the outer ones, pellucid.

Annulus—"Distinct."

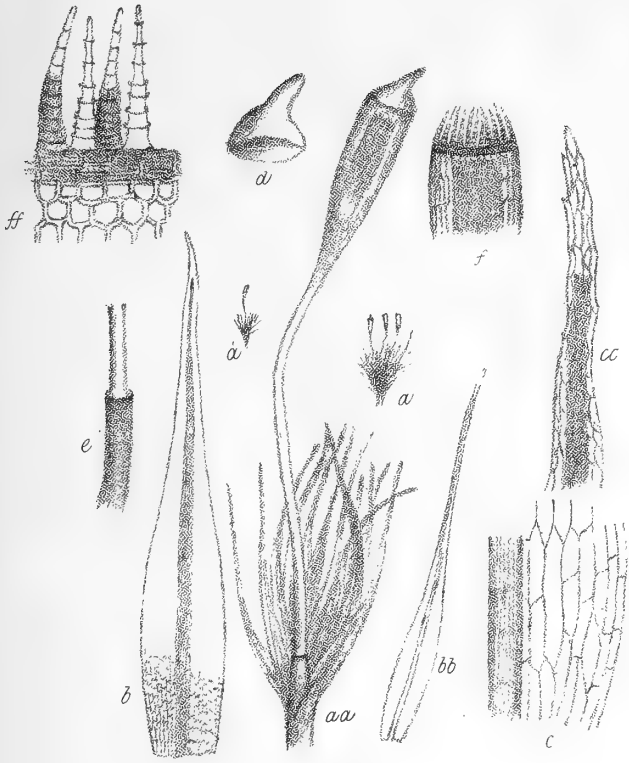
Spores—Small, globular, greenish.

GENERAL HABITAT—Sandstone rocks, "frequently on garden pots" (Hooker). Fruit:—May and June.

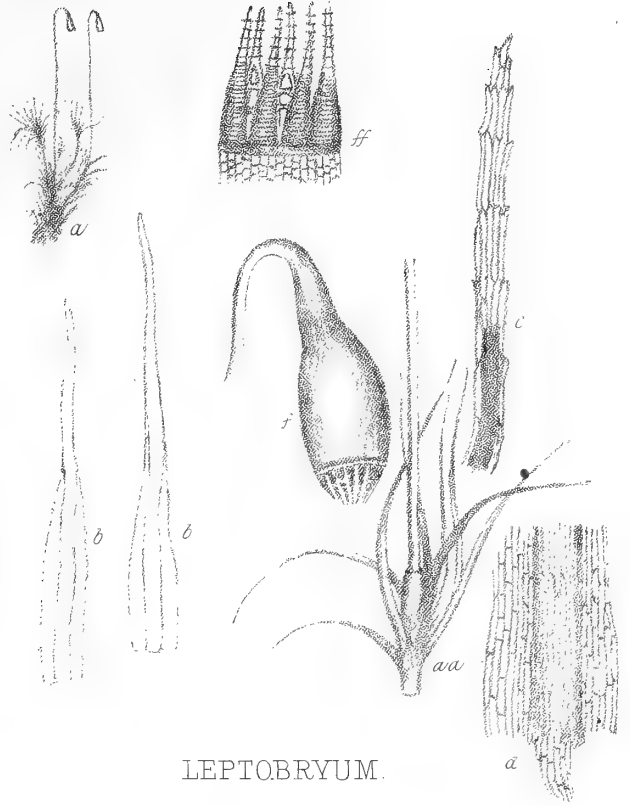
SPECIES ILLUSTRATED—Leptobryum pyriforme (Wils.), Bryum pyriforme (Hedw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Leaves, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *d*, Base of leaf, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Teeth of peristome.

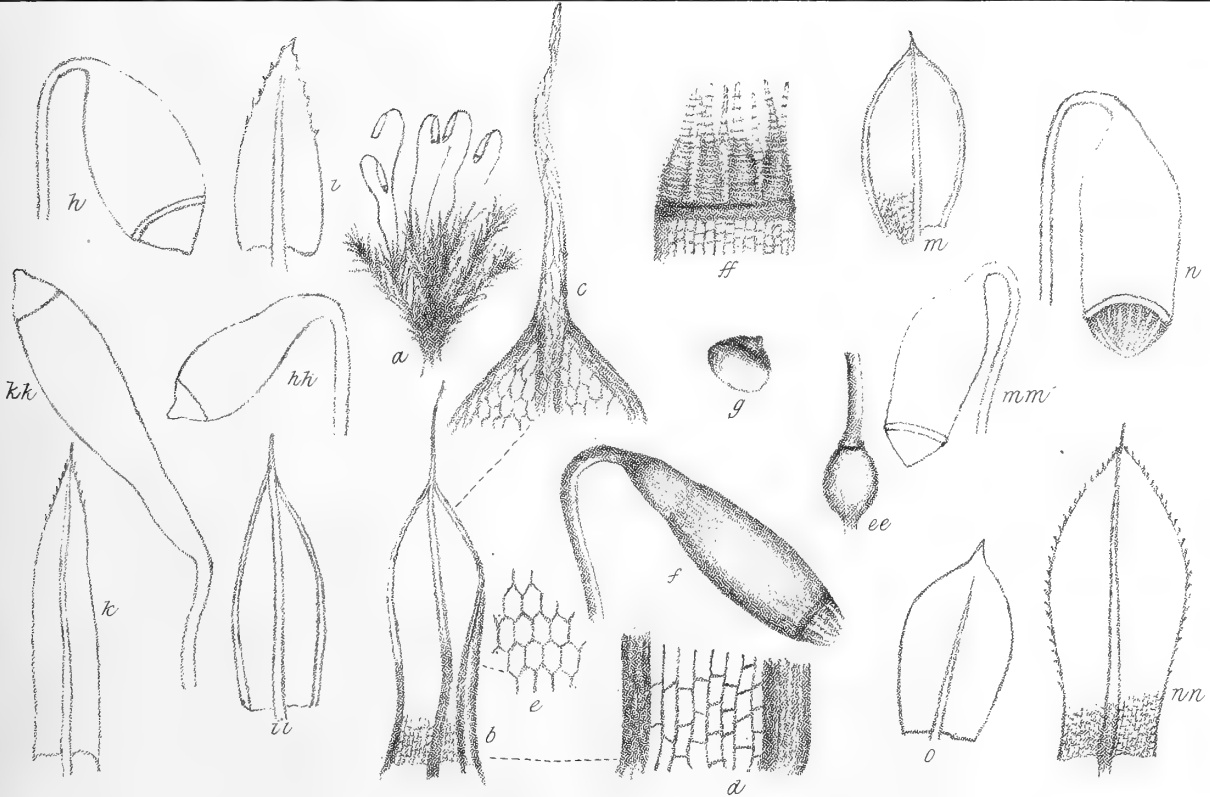
This genus is represented in Britain by the species figured.



ORTHODONTIUM.

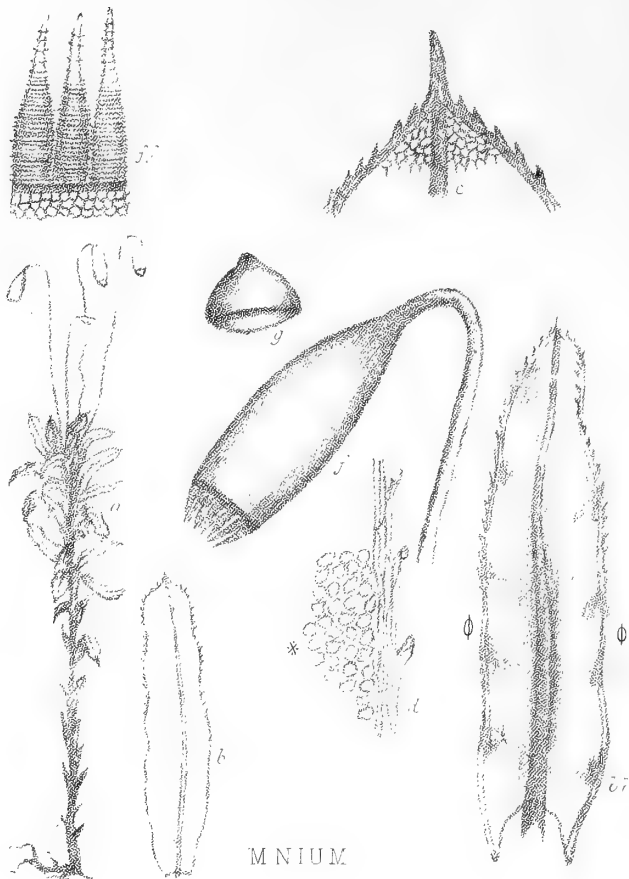


LEPTOBRYUM.

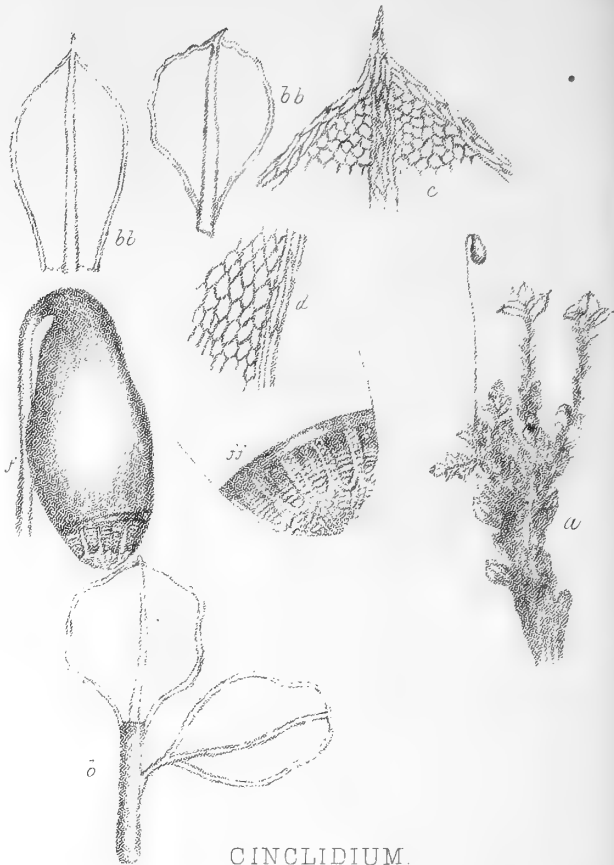


BRYUM.

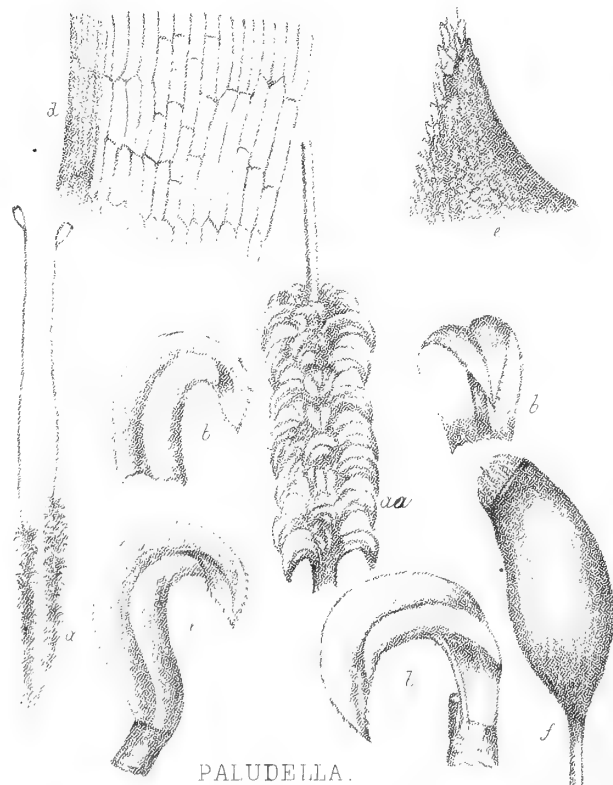




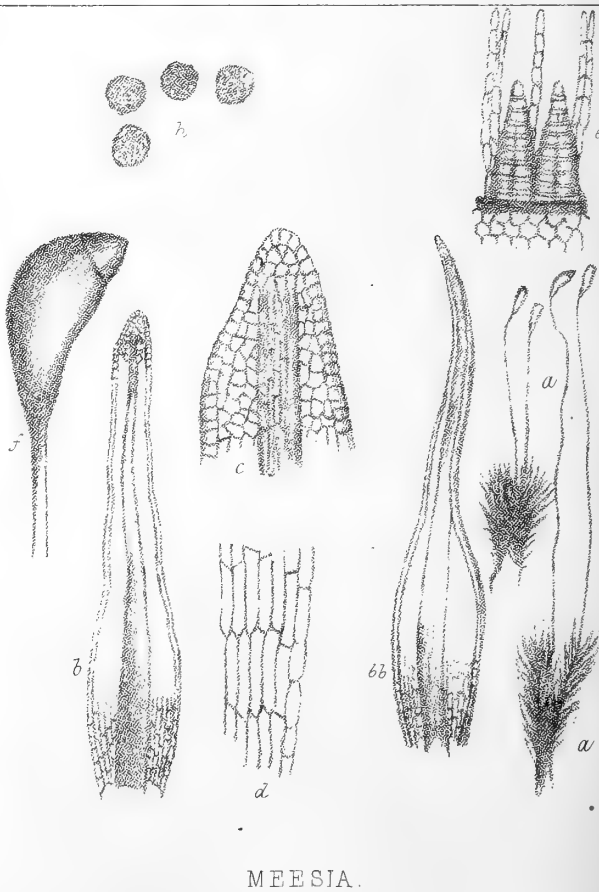
MNIUM



CINCLIDIUM.



PALUDELLA.



MEESIA.

50. GENUS BRYUM, *Hook. & Tayl.*

WHOLE PLANT—Perennial, growing in dense tufts on the ground, on walls, on the roofs of buildings, having terminal fruit, and varying from a light yellowish-green colour to the darkest shade of green or purple, from $\frac{1}{2}$ an inch to 3 inches in height.

STEM—Simple or branched, beset with radicles.

LEAVES—Lanceolate, ovate, concave, entire or serrated on the margin, semiplexicaule, usually in eight rows; nerve ceasing below the apex, or reaching beyond areolation, rhomboid.

INFLORESCENCE—Monoicous, dioicous, or synoicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA)—Paraphyses, filiform.

Vaginula—Ovate or oblong.

Capsule—Presents a variety of forms and length, clavate, pyriform, oblong or ovate, pendulous, inclined, or erect, generally on a long seta, prevailing colour yellowish-brown.

Calyptra—Cucullate, fugacious, small.

Operculum—Pointed, convex, rostellate.

Peristome—Double, with 16 outer, equidistant, lanceolate, dark red teeth, having an external medial line and transverse bars; inner teeth alternate, divided into 16 processes, which are carinate.

Annulus—Simple, or compound, in some species absent.

Spores—Small, irregularly shaped, green or yellow or reddish-brown.

GENERAL HABITAT—On the ground, in crevices of rocks, on walls, the roofs of buildings, sandy and turfy heaths. **Fruit**:—Summer, autumn, and winter.

SPECIES ILLUSTRATED—*Bryum Capillare* (Hedw.), and *B. Wahlenbergii*, *B. Warneum*, *B. elongatum*, *B. argenteum*, *B. roseum*, and *B. Tozeri* in part.

Reference to Plate—*a*, Plant, natural size, *Bryum Capillare*; *b*, Leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Mid-leaf cells, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Peristome, $\times 1$ -in.; *g*, Operculum, $\times 2$ -in.; *ee*, Vaginula, $\times 1$ -in.; *i*, Leaf, *h*, Capsule, *B. Wahlenbergii*; *ii*, Leaf, *hh*, Capsule, *B. Warneum*; *k*, Leaf, *kk*, Capsule, *B. elongatum*; *m*, Leaf, *mm*, Capsule, *B. argenteum*; *n*, Leaf, *nn*, Capsule, *B. roseum*; *o*, Leaf, *B. Tozeri*—all $\times 2$ -in.—*vide* Synopsis specierum, Hobk., pp. 106.

This genus is represented in Britain by forty-six species, according to Hobkirk; Wilson enumerates thirty-three species.

51. GENUS MNIUM, *Bruch. & Sch.*

WHOLE PLANT—Perennial, conspicuous plants on account of their elegance and size, gregarious or caespitose, usually erect, mostly growing on the ground in shaded places, from 1 inch to 6 inches in height, varying in colour.

STEM—Decumbent or erect, with more or less prostrate branches, rooting at the base.

LEAVES—Very variable, both in shape and arrangement, often large, ligulate, lanceolate, or roundish, spinose or entire; nerve reaching to or beyond the apex of the leaf; areolæ large, hexagonal.

INFLORESCENCE—Dioicous or synoicous.

Barren Flower (ANTHERIDIA)—Numerous, discoid, paraphyses clavate.

Fertile Flower (ARCHEGONIA)—Paraphyses filiform.

Vaginula—

Capsule—On a long fruit stalk, pendulous, oblong or oval, colour chestnut brown.

Calyptra—Cucullate, small.

Operculum—Convex, rostrate, and long, or short and obtuse.

Peristome—Double, having 16 outer lanceolate, tapering teeth, with prominent transverse cross-bars; inner peristome composed of 16 orange coloured teeth.

Annulus—Compound.

Spores—Red-brown or green, small.

GENERAL HABITAT—On rocks, in shady woods, on banks, walls, and in marshes. **Fruit**:—Spring and summer.

SPECIES ILLUSTRATED—*Mnium undulatum* (Hedw.) [*Bryum ligulatum* (Schreb.)].

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, slightly magnified; *bb*, Same, $\times 2$ -in.; *c*, Apex of leaf, $\times 1$ -in.; *d*, Mid-leaf and marginal cells, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Peristome, 1-in.; *g*, Operculum, 2-in.

This genus is represented in Britain by thirteen species, according to Hobkirk.

52. GENUS CINCLIDIUM, *Swartz.*

WHOLE PLANT—Perennial, closely resembling *Mnium*, erect, growing on bogs local and rare, from 2 inches to 4 inches in height, densely caespitose.

STEM—Tufted and matted, having purple radicles.

LEAVES—Large, roundish, entire, with thick border, opaque; areolæ hexagonal; nerve reaching to the apex, colour purple, lower leaves distant, spreading, upper one crowded.

INFLORESCENCE—Synoicous.

Barren Flower (ANTHERIDIA)—With clavate paraphyses.

Fertile Flower (ARCHEGONIA)—

Vaginula—Oblong.

Capsule—Pyriform, pendulous, with a distinct neck or *apophysis*, colour light brown.

Calyptra—Cucullate, small.

Operculum—Convex, obtuse.

Peristome—Double, with 16 outer teeth, obtuse and short; inner peristome intermediate, membranous, 16 in number.

Annulus—Small.

Spores—Large.

GENERAL HABITAT—Bogs, rare in Britain and local. **Fruit**:—June, July.

SPECIES ILLUSTRATED—*Cinclidium Stigium* (Swartz.).

Reference to Plate—*a*, Plant, natural size; *b*, Branch leaves, $\times 2$ -in.; *bb*, Stem leaves, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, cells, of mid-leaf and margin, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Peristome, $\times 1$ -in.

54. GENUS PALUDELLA, *Ehrh.*

WHOLE PLANT—Perennial, erect, densely beset with brown radicles, caespitose, growing in boggy places in greenish or yellowish patches, having terminal fruit, varying in height from 2 inches to 6 inches.

STEM—Simple, elongated.

LEAVES—Crowded, squarrose, recurved, amplexicaul, ovate, lanceolate, carinate, spreading, margin recurved; nerve reaching nearly or quite to the apex, serrulate at the apex; areolæ round, opaque in the upper part of the leaf; basal cells elongate.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Terminal, with clavate paraphyses.

Fertile Flower (ARCHEGONIA)—

Vaginula—Oblong.

Capsule—Solitary, terminal, smooth, slightly bending, oblong, with a short neck on a long fruit stalk.

Calyptra—Cucullate.

Operculum—Small.

Peristome—As in *Bryum*.

Annulus—Large.

Spores—Rather small.

GENERAL HABITAT—Boggy places, local, rare. Fruit:— [* See below.]

SPECIES ILLUSTRATED—*Paludella squarrosa* (Bridel).

Reference to Plate—*a*, Plant, natural size; *aa*, Portion of same, $\times 2$ -in.; *b*, Stem leaves, $\times 1$ -in.; *e*, Apex of leaf, $\times \frac{1}{2}$ -in.; *d*, Basal cellules, $\times \frac{1}{2}$ -in.

This genus is represented in Britain by the species figured. The fruit has not yet been discovered in Britain.
* [The drawing is made from a specimen kindly given me by Mr. C. P. Hobkirk, and gathered in Finland by Mr. E. F. Lackström.]

55. GENUS MEESIA, *Hedwig.*

WHOLE PLANT—Perennial, a fine handsome genus, erect, branched, the fructification terminal, with a long fruit stalk, height of the plant varying from 1 inch to 3 inches.

STEM—Elongated, caespitose, erect, covered with radicles.

LEAVES—Lanceolate, or subulate, obtuse, erect, crowded, with a strong nerve reaching near the apex; areolæ small, roundish, or quadrate in the upper part of the leaf, cells elongated at the base.

INFLORESCENCE—Dioicous, synoicous, or monoicous.

Barren Flower (ANTHERIDIA)—Numerous, oblong, paraphyses clavate.

Fertile Flower (ARCHEGONIA)—Gemmiform, few.

Vaginula—Oblong.

Capsule—Curved, clavate, the mouth small, the neck long and tapering into a long fruit stalk, colour chestnut brown.

Calyptra—"Conico-submitriform, fugacious."

Operculum—Conical, small.

Peristome—Double, with 16 short, obtuse, outer teeth, having a conspicuous medial line; inner teeth much longer than the outer ones, being a membrane divided into 16 narrow processes.

Annulus—Small.

Spores—Large, smooth, yellow.

GENERAL HABITAT—Wet places, near springs, in mountainous situations. Fruit:—Summer.

SPECIES ILLUSTRATED—*Meesia uliginosa* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem-leaf, $\times 2$ -in.; *bb*, Branch-leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *d*, Basal cellules, $\times \frac{1}{2}$ -in.; *e*, Outer and inner teeth of peristome, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

56. GENUS AMBLYODON.

WHOLE PLANT—Perennial, gregarious, erect, growing principally in mountainous districts; fruit terminal, varying from 1½ inches to 4 inches in height.

STEM—Short, radiculose, lower part of the stem destitute of leaves.

LEAVES—Lanceolate, spreading, crowded above; lower leaves more distant; nerve ceasing below the apex; areolæ large, rhomboid, denticulate at the apex.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Numerous, paraphyses clavate.

Fertile Flower (ARCHEGONIA)—Styles long.

Vaginula—

Capsule—Solitary, clavate, suberect, on a long seta, neck tapering into the fruit stalk, colour chestnut-brown.

Calyptra—Small, "conico-mitriform."

Operculum—Conical, small.

Peristome—Double, outer teeth reddish-brown, similar to *Bryum*, shorter than the inner ones; inner teeth divided into 16 carinate processes.

Annulus—Small.

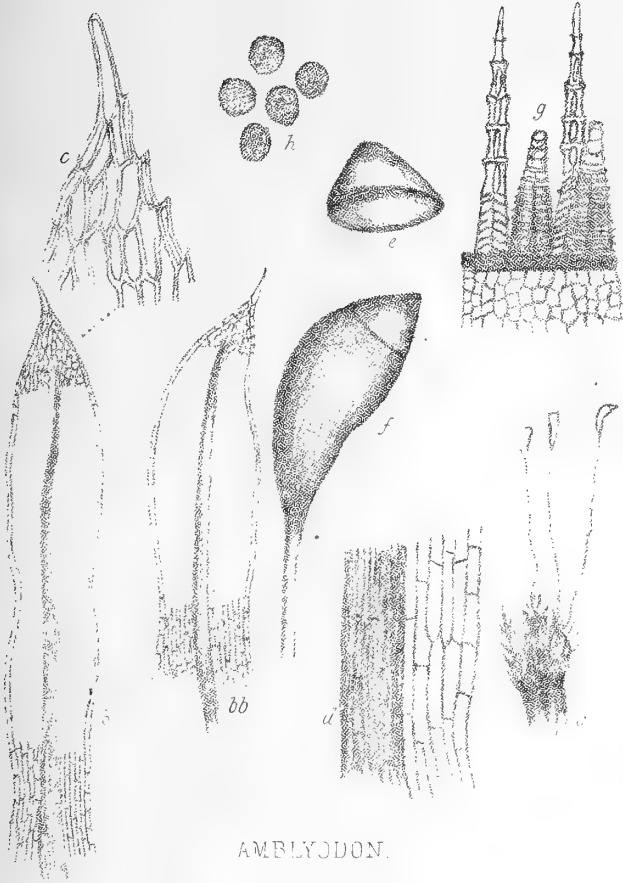
Spores—Large, smooth.

GENERAL HABITAT—Wet places in mountainous districts. Fruit:—June, July.

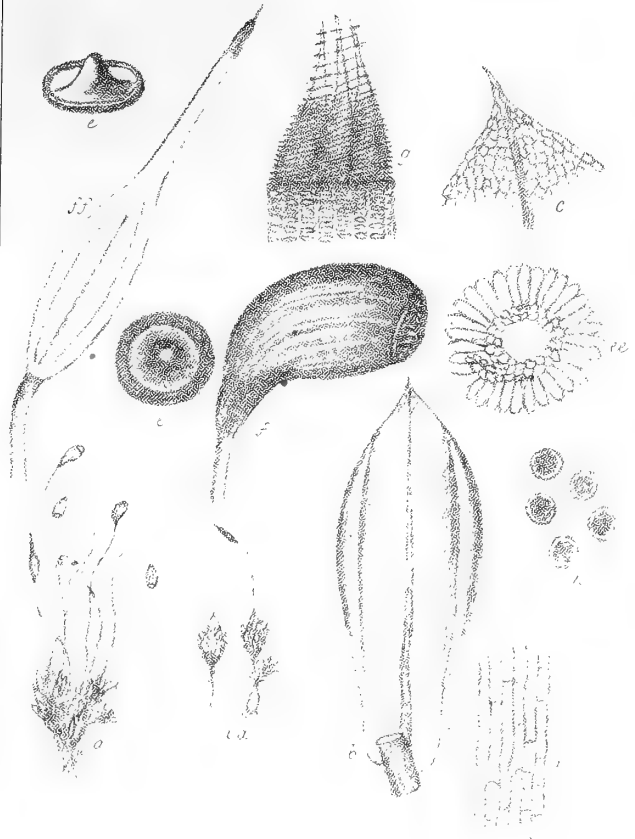
SPECIES ILLUSTRATED—*Amblyodon dealbatus* (P. Beauv.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *d*, Basal cellules, $\times \frac{1}{2}$ -in.; *e*, Operculum, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Outer and inner teeth of peristome, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

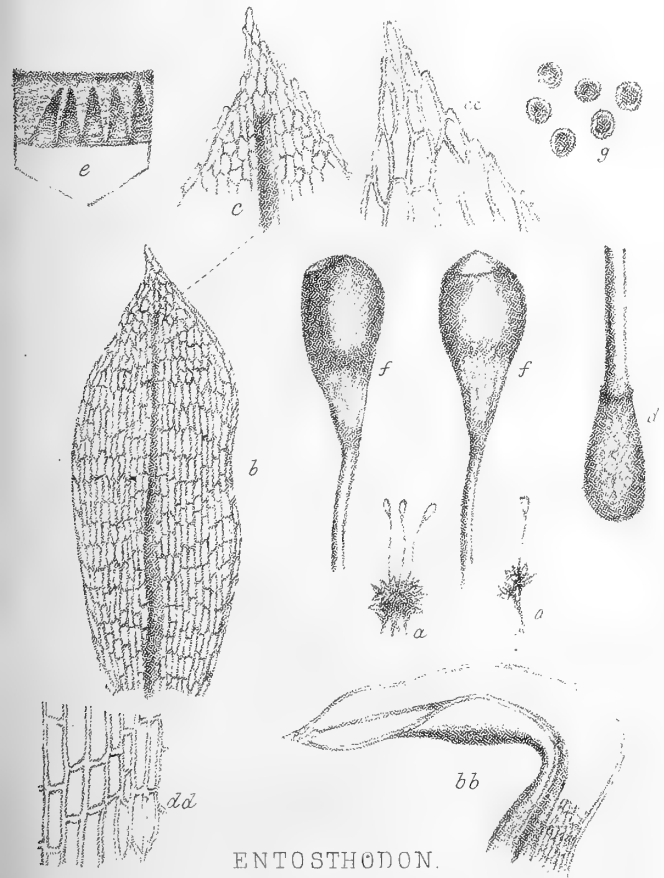
This genus is represented in Britain by the species figured.



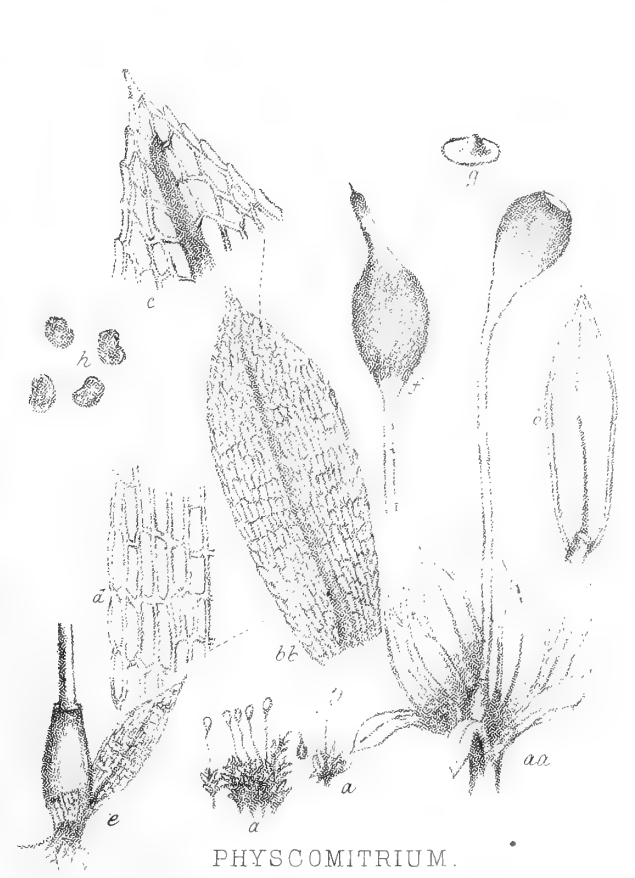
AMBLYODON.



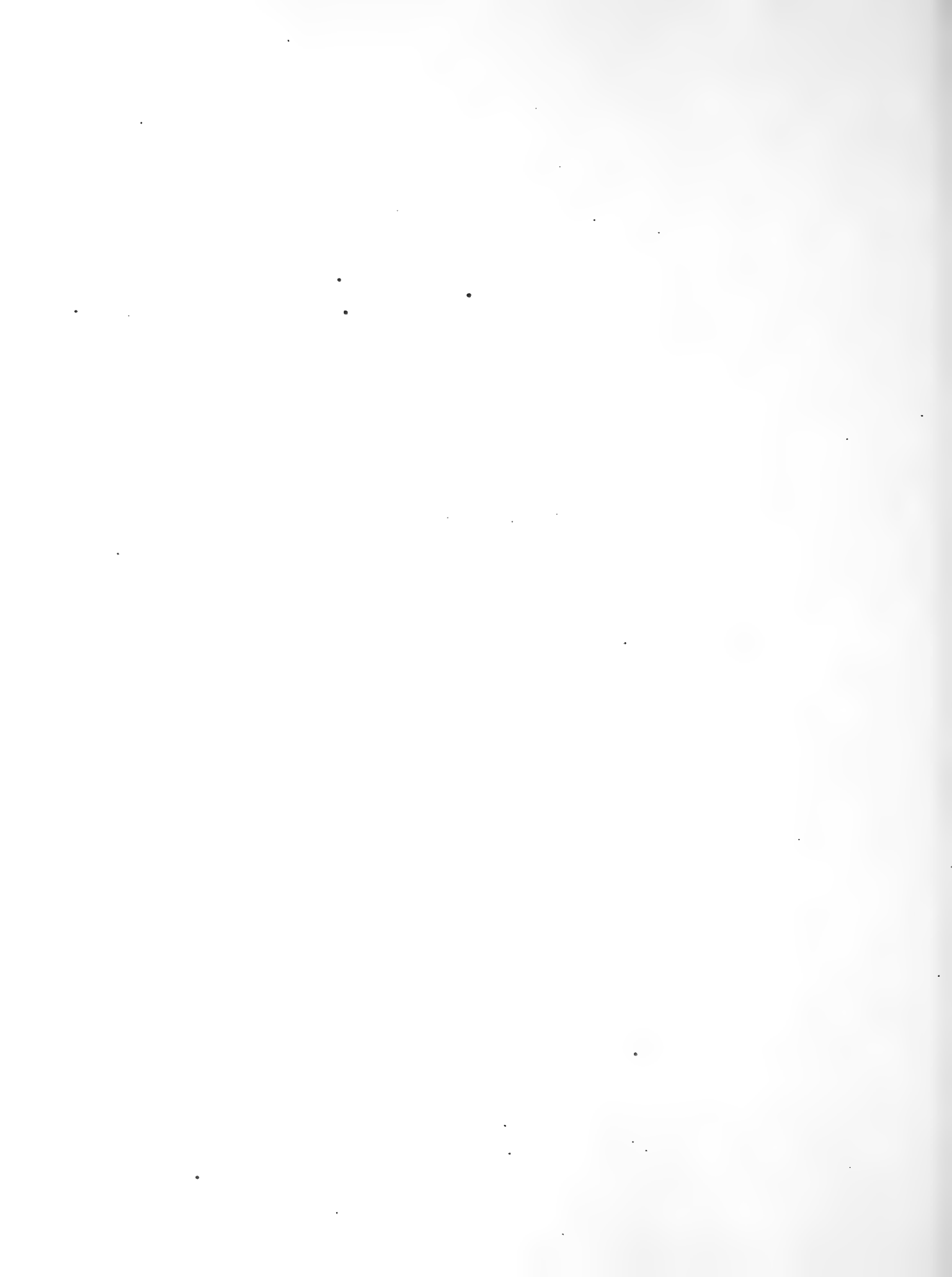
FUNARIA.

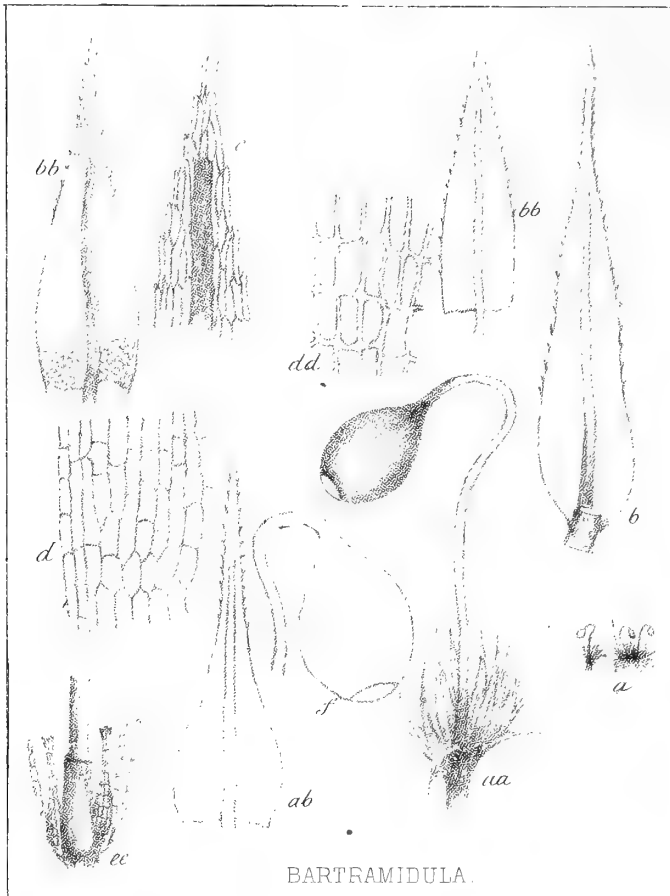


ENTOSTHODON.

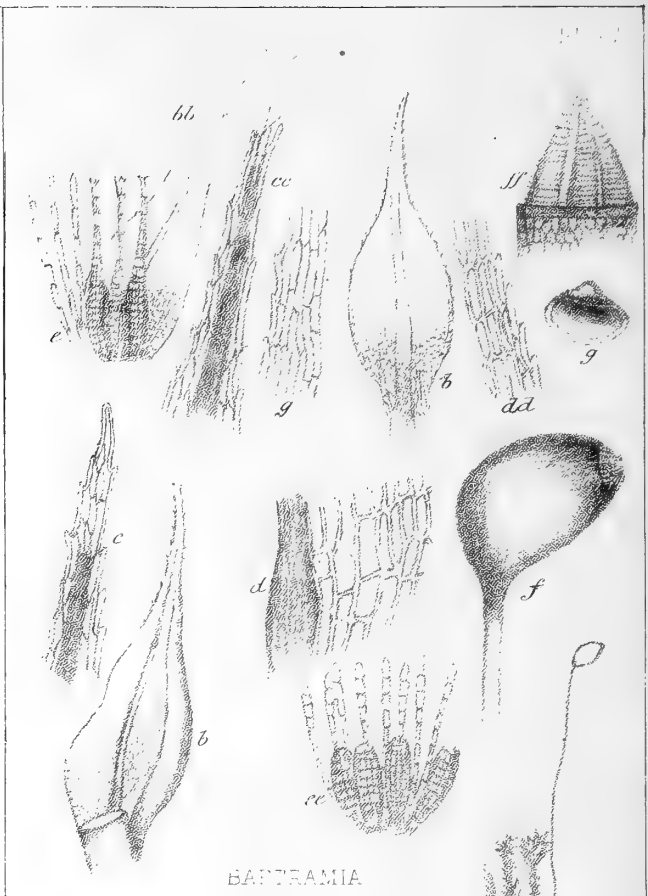


PHYSCOMITRIUM.

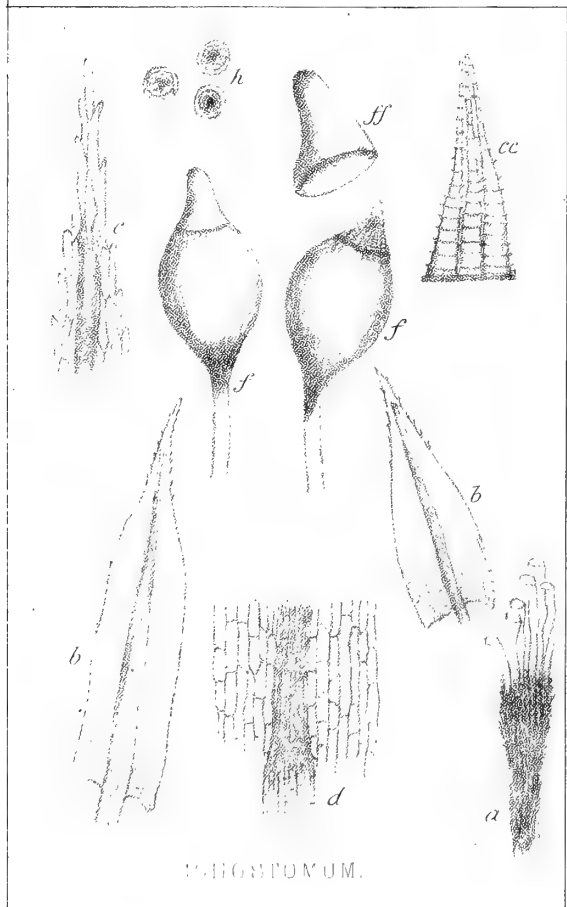




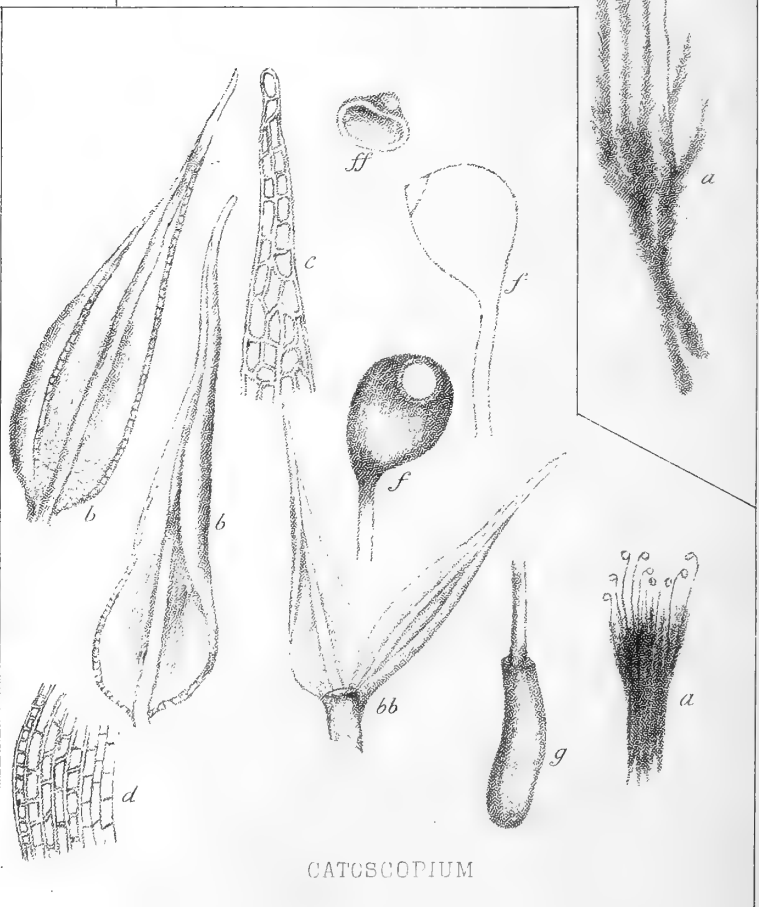
BARTRAMIDULA.



BARTRAMIA.



PINGUICULA.



CATOCLOPIUM.

57. GENUS FUNARIA, Schreb.

WHOLE PLANT—Sub-biennial, growing on the ground somewhat caespitose, erect; fruit drooping, from 1-inch to 2-inches in height.

STEM—Simple, sometimes branched, short.

LEAVES—Ovate, or obovate-acuminate, texture thin, cellules large, hexagonal at the apex, quadrate at the base, succulent. Nerve ceasing below the apex, upper leaves crowded, lower ones distant.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Discoid, numerous.

Fertile Flower (ARCHEGONIA)—Few.

Vaginula—Oblong.

Capsule—Pyriform, solitary, of thick texture, mouth comparatively small, neck tapering into the curved fruit stalk; colour when young a delicate bright green, as it matures it becomes a rich brown.

Calyptra—Inflated below, cylindrical above, smooth.

Operculum—Conical, obtuse.

Peristome—Double, having 16 oblique outer teeth, lanceolate, with prominent trabeculae connected at the apices. It is a very beautiful object for the microscope.

Annulus—Large and conspicuous.

Spores—Large, orange-red, punctulate.

GENERAL HABITAT—On calcareous soil, or limestone banks, and walls. Fruit:—April, May.

SPECIES ILLUSTRATED—*Funaria hygrometrica* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Young plant natural size; *b*, Stem leaf, $\times 2$ -in.; *c*, Operculum, $\times 1$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Apical cells, $\times \frac{1}{4}$ -in.; *ee*, Annulus, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Young capsule with calyptra, $\times 2$ -in.; *g*, Teeth of peristome, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by four species.

58. GENUS ENTOSTHODON, Schwaegr.

WHOLE PLANT—Sub-biennial, greatly resembling *Funaria* in general character and habit, erect, caespitose, growing on the soil from $\frac{1}{4}$ -inch to 1-inch in height.

STEM—Short, bearing terminal fruit.

LEAVES—Obovate-acuminate, texture thin, areolation large oblong, cellules succulent, nerve loosely cellular, ceasing below the apex; colour light green.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Paraphyses clavate.

Fertile Flower (ARCHEGONIA)—Few without paraphyses.

Vaginula—Ovate.

Capsule—Erect, pyriform; mouth constricted.

Calyptra—Cucullate.

Operculum—Convex, obtuse.

Peristome—Single, with 16 simple oblique lanceolate teeth, transversely barred, inserted below the orifice of the capsule.

Annulus—None.

Spores—Moderate size, yellowish.

GENERAL HABITAT—On moist banks and crevices of rocks. Fruit:—July.

SPECIES ILLUSTRATED—*Entosthodon Templetoni* (Schwaegr.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *cc*, Same, $\times \frac{1}{4}$ -in.; *d*, Vaginula, $\times 1$ -in.; *dd*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *f*, Capsules with operculum, $\times 2$ -in.; *g*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by two species.

59. GENUS PHYSCOMITRIUM, Bridel.

WHOLE PLANT—Annual, resembling *Entosthodon* and *Gymnostomum*, erect, gregarious, growing in large patches on the ground, from $\frac{1}{4}$ of an inch to $\frac{3}{4}$ of an inch in height.

STEM—Similar to *Entosthodon*.

LEAVES—Spreading, ovate or obovate-acuminate, areolation large, somewhat hexagonal at the apex, oblong at the base, nerve ceasing below the apex.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—With clavate paraphyses.

Fertile Flower (ARCHEGONIA)—Few.

Vaginula—Oblong.

Capsule—Pyriform, solitary, texture thin, colour brown.

Calyptra—Cucullate.

Operculum—Obtuse, apiculate.

Peristome—None.

Annulus—Wanting.

Spores—Large, reniform.

GENERAL HABITAT—Moist shady banks and ditches, also on fallows and heaths. Fruit:—March, April.

SPECIES ILLUSTRATED—*Physcomitrium ericetorum* (De Notaris).

Reference to Plate—*a*, Plant, natural size; *aa*, Same, $\times 2$ -in.; *b*, Stem leaf, $\times 2$ -in.; *bb*, Stem leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Vaginula, $\times 1$ -in.; *f*, Capsule with Calyptra, $\times 2$ -in.; *g*, Operculum, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by four species.

60. GENUS BARTRAMIDULA, *B. & S.*

WHOLE PLANT—Perennial, very small, and delicate, erect, a most beautiful little moss, growing in patches, about $\frac{1}{2}$ an inch in height.

STEM—Decumbent, branched, radiculose.

LEAVES—Ovate or lanceolate, erect, denticulate, nerve strong ceasing below the apex, areolæ, oblong-quadrate, or hexagonal, bright green.

INFLORESCENCE—Synoicous.

Barren Flower (ANTHERIDIA)—

Fertile Flower (ARCHEGONIA)—Few, paraphyses filiform.

Vaginula—Cylindrical, surrounded with archegoniæ.

Capsule—Drooping, somewhat pyriform, or globular, with a short tapering neck on a curved reddish fruit stalk, colour pale pink, texture thin, pellucid.

Calyptra—Small, fugacious, cucullate.

Operculum—Small, subconical.

Peristome—None.

Annulus—Wanting.

Spores—Large, reddish brown, granular.

GENERAL HABITAT—Growing on the mountains of Wales, Scotland, and Ireland. On turfy soil. Fruit:—October.

SPECIES ILLUSTRATED—*Bartramidula Wilsoni* (Bruch & Sch.).

Reference to Plate—*a*, Plant, natural size; *aa*, Plant, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *bb*, Branch leaves, $\times 1$ -in.; *ab*, Perichætal leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{2}$ -in.; *d*, Marginal cells, $\times \frac{1}{4}$ -in.; *dd*, Basal cells, $\times \frac{1}{4}$ -in.; *ee*, *Vaginula*, with archegonia and paraphyses, $\times 1$ -in.; *f*, *Capsule*, $\times 1$ -in.

This genus is represented in Britain by the species figured.

61. GENUS BARTRAMIA, *Hedwig.*

WHOLE PLANT—Perennial, fine showy erect plants, growing on the ground or on rocks, having terminal fructification, and varying in height from $\frac{1}{2}$ an inch to 6 inches, of yellowish green or glaucous hue.

STEM—Erect, or decumbent, branches short and slender, at the top of the stem.

LEAVES—Lanceolate, rigid, serrulate, spreading, papillose, areolæ, oblong-quadrate small in the middle and upper portions of the leaf, basal cells larger, nerve strong, either ceasing below or continuing to the apex.

INFLORESCENCE—Monoicous, dioicous or synoicous, terminal.

Barren Flower (ANTHERIDIA)—Cylindrical, paraphyses filiform.

Fertile Flower (ARCHEGONIA)—Mixed with filiform paraphyses.

Vaginula—Oblong.

Capsule—Large, somewhat spherical or oval, cernuous or erect, usually on long straight fruit stalk occasionally short and curved, reddish brown.

Calyptra—Small, dimidiate.

Operculum—Small, conical.

Peristome—Double or single, having 16 lanceolate equidistant outer teeth, when dry erect, resembling a cone when moist, colour red.

Annulus—None.

Spores—Large, reddish.

GENERAL HABITAT—Shady moist banks, wet places, near springs in mountainous districts, and on a calcareous or chalky soil. Fruit:—Spring, Summer, and Autumn.

SPECIES ILLUSTRATED—*Bartramia calcarea* (Bruch & Sch.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem-leaf, $\times 1$ -in.; *bb*, Perichætal leaf, $\times 1$ -in.; *c*, Apex of stem leaf, $\times \frac{1}{4}$ -in.; *cc*, Apex of Perichætal leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *dd*, Midleaf cells, $\times \frac{1}{2}$ -in.; *e*, Archegonia and paraphyses, $\times 1$ -in.; *ee*, Antheridia and paraphyses, $\times 1$ -in.; *f*, *Capsule*, $\times 2$ -in.; *ff*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *g*, Cells of perichætal leaf, $\times \frac{1}{4}$ -in.; *gg*, *Operculum*, $\times 1$ -in.

This genus is represented in Britain by twelve species.

62. GENUS CONOSTOMUM, *Swartz.*

WHOLE PLANT—Perennial, erect, glaucous green, fruit terminal, about 2 inches in height, of an Alpine habit.

STEM—Radiculose, branched.

LEAVES—Lanceolate, serrulate at the upper part, nerve strong, ceasing below the apex, areolation quadrate, elongated.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—With clavate paraphyses.

Fertile Flower (ARCHEGONIA)—Styles long.

Vaginula—Oblong.

Capsule—Globose, cernuous, reddish brown, on a long fruit stalk.

Calyptra—Large, cucullate.

Operculum—Large, conical, rostrate.

Peristome—Single, with 16 equidistant red lanceolate teeth united at the points, and transversely barred, giving the appearance of a cone.

Annulus—None.

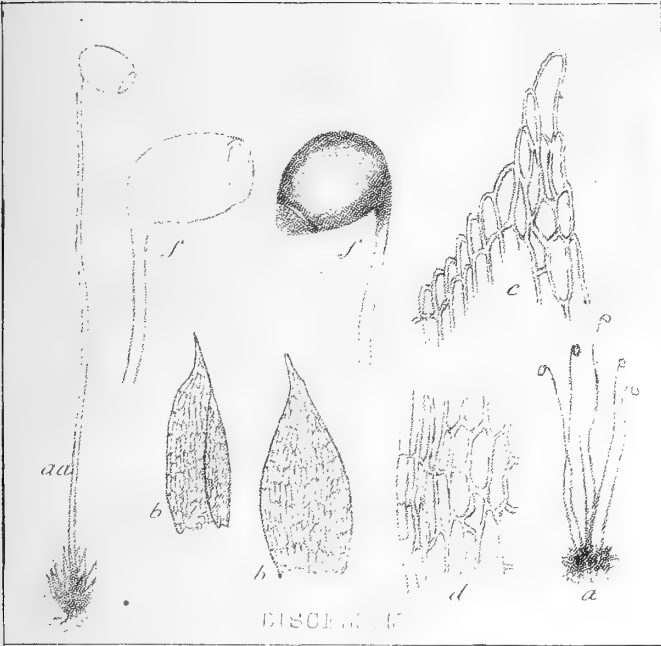
Spores—Large, yellowish brown.

GENERAL HABITAT—On the Scotch mountains. Fruit:—August, September.

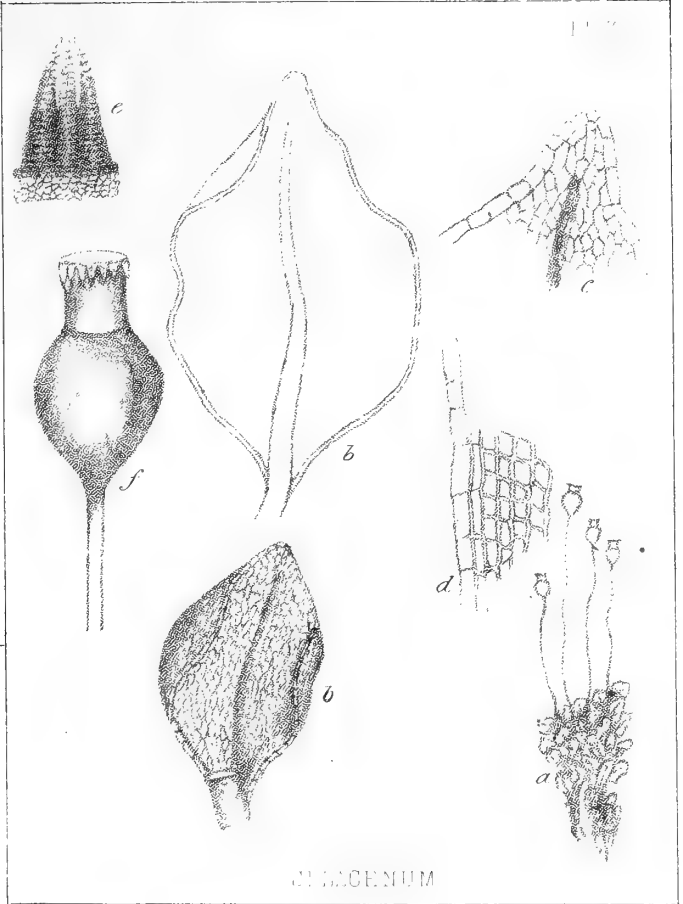
SPECIES ILLUSTRATED—*Conostomum boreale* (Swartz).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *c*, Apex of stem leaf, $\times \frac{1}{4}$ -in.; *cc*, Teeth of peristome, $\times 1$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *f*, *Capsules*, $\times 2$ -in.; *ff*, *Operculum*, $\times 1$ -in.; *h*, *Spores*, $\times \frac{1}{4}$ -in.

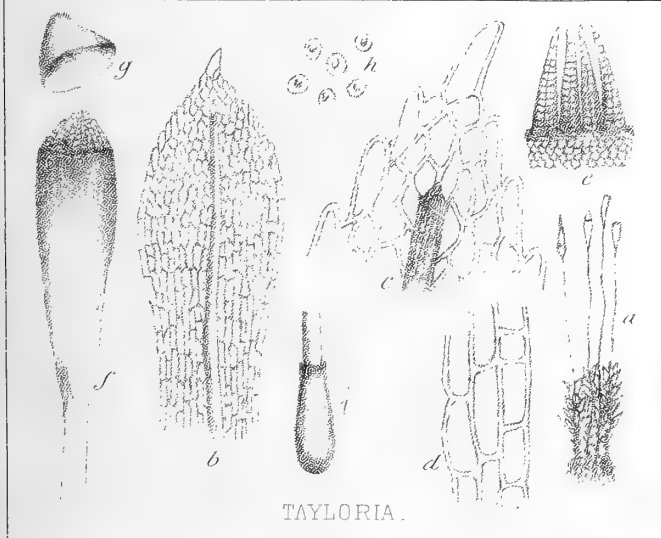
This genus is represented in Britain by the species figured.



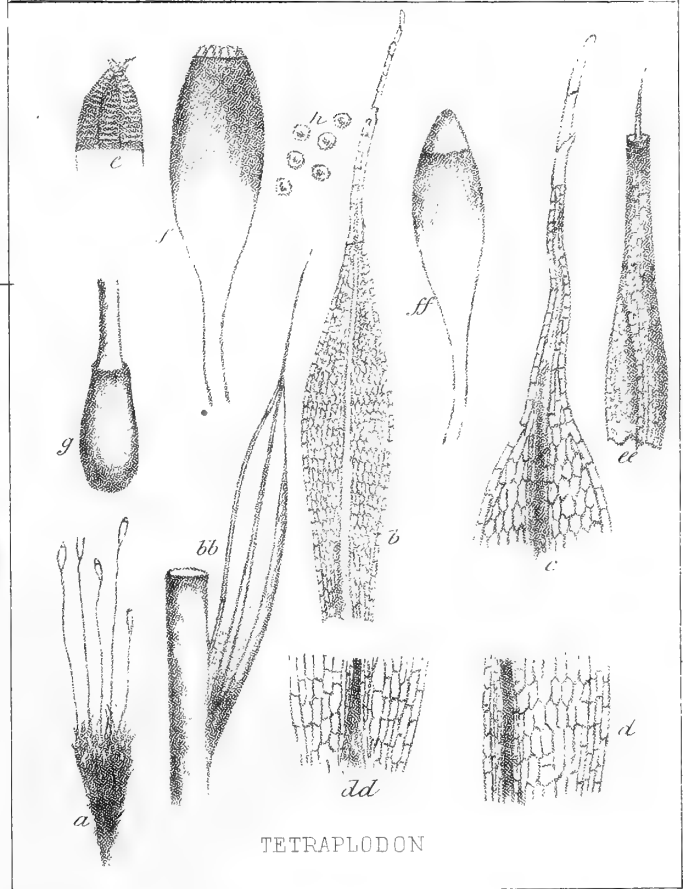
DISCARIA



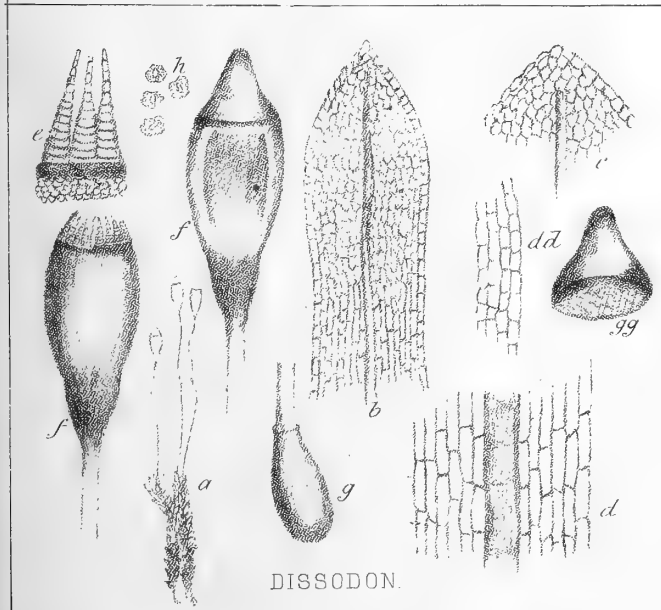
SACCINUM



TAYLORIA

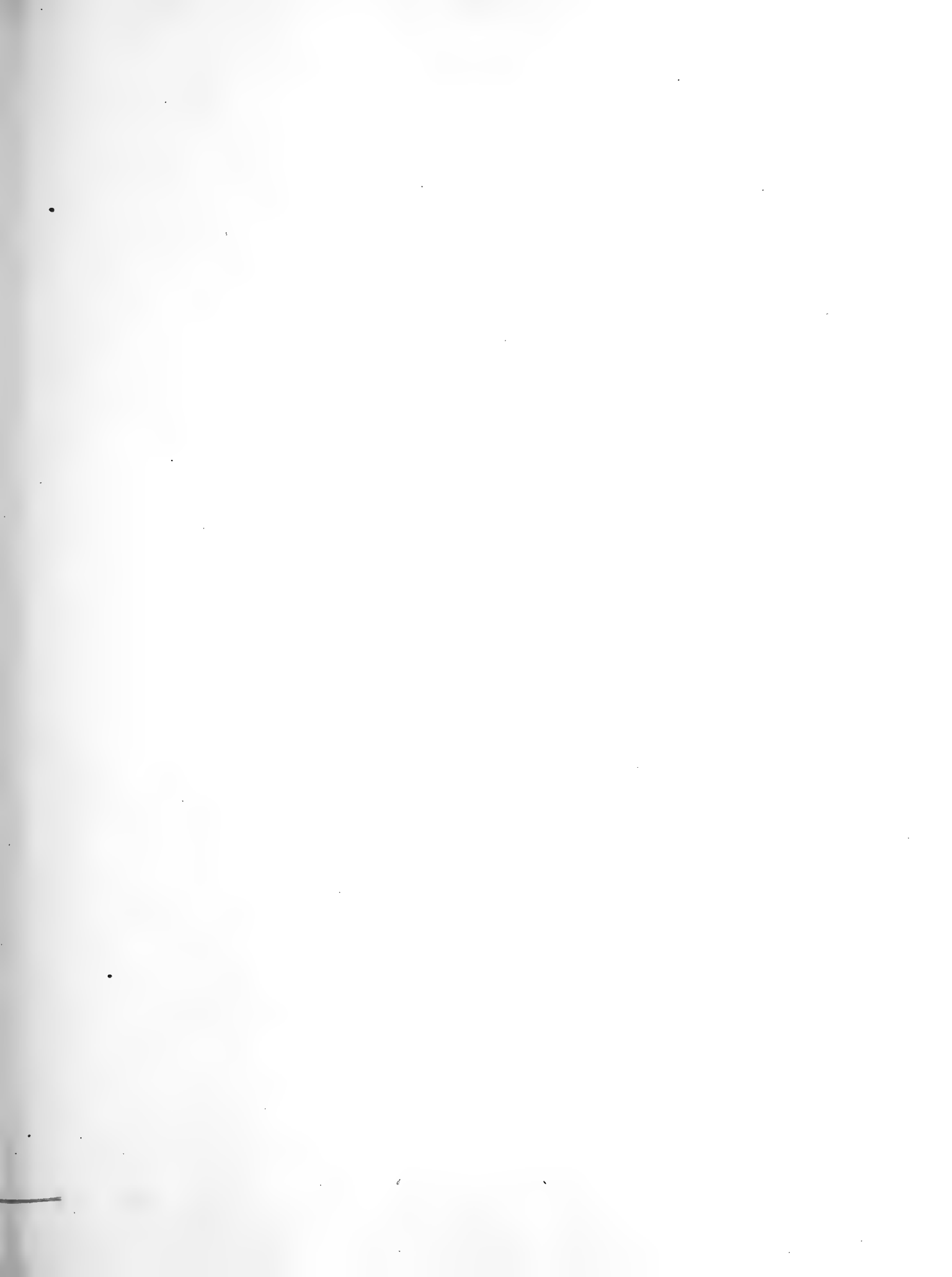


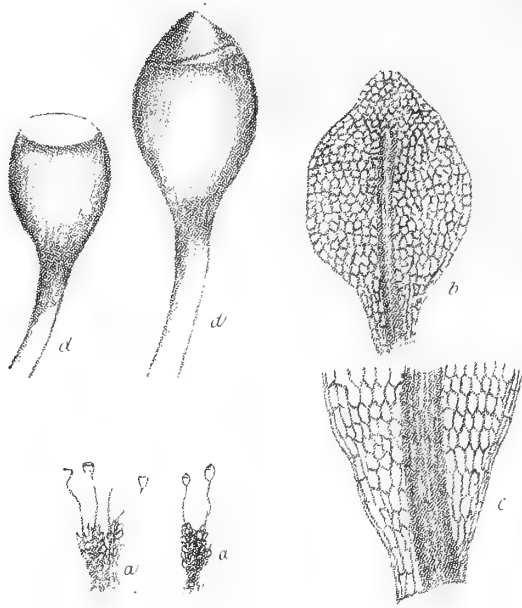
TETRAPODON



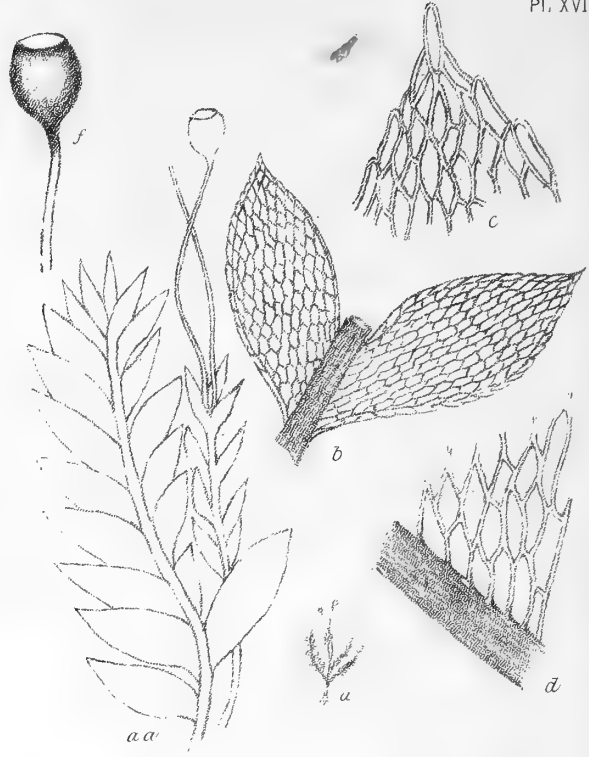
DISSODON



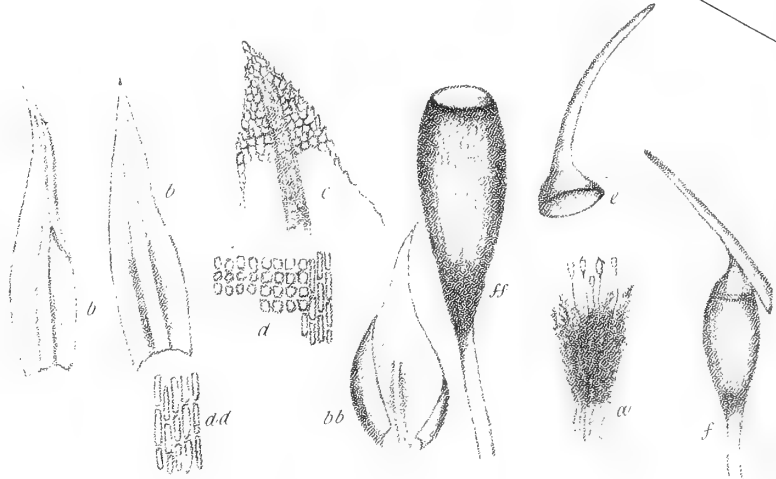




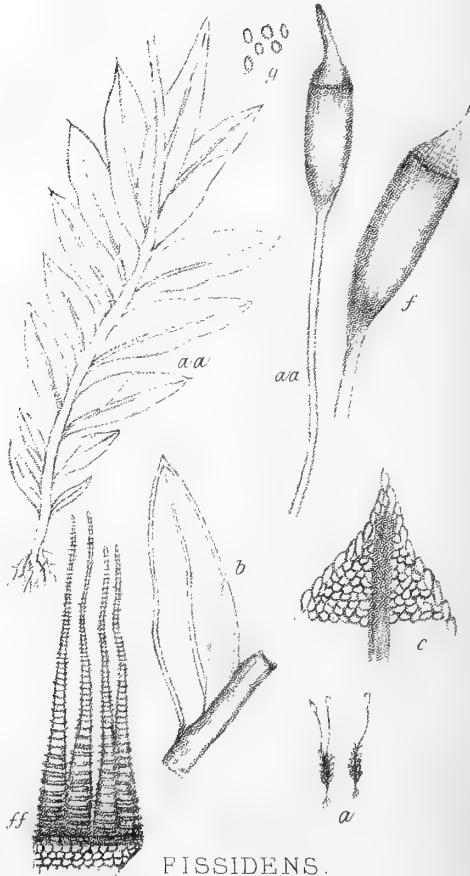
CEDIPEDIUM



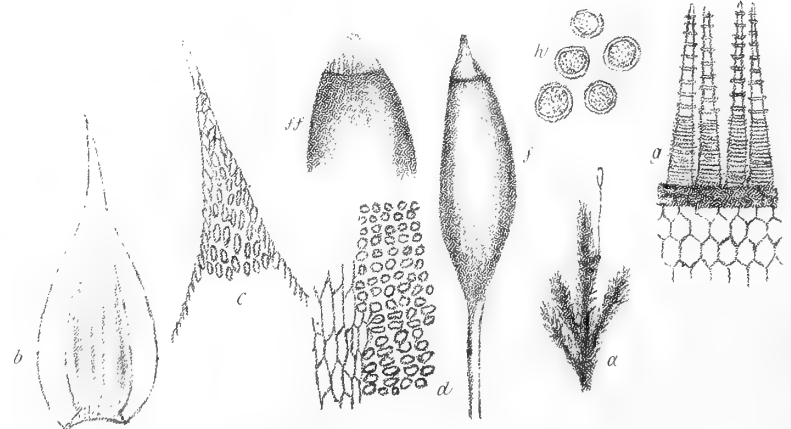
SCHISTOSTEGA.



ANÆCTANGIUM



FISSIDENS.



LEUCODON.

63. GENUS CATOSCOPIUM, *Bridel.*

WHOLE PLANT—Perennial, growing in tufts, in sub-Alpine places, erect, with a remarkable peculiar capsule and soft green leaves, from 2 inches to 3 inches in height.

STEM—Dichotomous, slender, radiculose.

LEAVES—Lanceolate, carinate, 8 in a row, spreading, nerve ceasing below the apex, areolæ small, opaque, or quadrate.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Terminal, gemmiform, with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Few, without paraphyses.

Vaginula—Oblong, curved.

Capsule—Round, or obovate, small, solitary, smooth, of thick texture, colour red.

Calyptra—Cucullate, fugacious, small.

Operculum—Conical, small.

Peristome—Single, composed of 16 short lanceolate teeth, with transverse bars and medial line.

Annulus—None.

Spores—Large.

GENERAL HABITAT—On moist Alpine rocks. Fruit:—August.

SPECIES ILLUSTRATED—*Catoscopium nigrum* (Bridel). *Weissia nigrita* (Hook and Tayl.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *bb*, Same with portion of stem, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal and marginal cells, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Operculum, $\times 1$ -in.; *g*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by the species figured.

64. GENUS DISCELIUM, *Bridel.*

WHOLE PLANT—Annual, stemless, with few leaves, very similar in its mode of growth to *Phascum*, gregarious—possessing a green velvety appearance, height of plant from 2 inches to 3 inches, of peculiar habit, and rare.

STEM—None.

LEAVES—Imbricated, few, entire, surrounding the base of the seta, erect, ovate, concave, pellucid, destitute of nerve, areolæ oblong-hexagonal, reddish when old.

INFLORESCENCE—Synoicous.

Barren Flower (ANTHERIDIA)—Few, with sub-clavate paraphyses.

Fertile Flower (ARCHEGONIA)—Thick with paraphyses.

Vaginula—Oblong, small.

Capsule—Globose, scarcely cernuous, on a long fruit stalk of thick texture, bright red. Fruit stalk about an inch or an inch and a half long, red.

Calyptra—Subulate, longer than the capsule.

Operculum—Large, conical.

Peristome—Single, composed of 16 lanceolate, broad, solid red teeth, transversely barred.

Annulus—Having two rows of cellules, and large at the mouth of the capsule.

Spores—Large.

GENERAL HABITAT—Clayey banks in the north of Britain. Fruit:—February, March.

SPECIES ILLUSTRATED—*Discelium nudum* (Bridel). *Weissia nuda* (Hook and Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Plant, $\times 2$ -in.; *b*, Leaves, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal and marginal cells, $\times \frac{1}{4}$ -in.; *f*, Capsules, $\times 1$ -in.

This genus is represented in Britain by the species figured.

65. GENUS SPLACHNUM, *Bruch & Sch.*

WHOLE PLANT—Perennial, growing in matted tufts, chiefly on the dung of animals in mountainous districts or in moist places, foliage pale or deep green, remarkable for its curiously formed capsule, varying in height from 1 to 2 inches.

STEM—Soft and succulent, branched dichotomously, lower part of stem beset with purplish radicles.

LEAVES—Roundish, obovate, or ovate-lanceolate, entire or obscurely denticulate, concave, areolation lax, oblong-hexagonal, nerve ceasing below the apex.

INFLORESCENCE—Monoicous or dioicous.

Barren Flower (ANTHERIDIA)—Numerous, with elevate paraphyses.

Fertile Flower (ARCHEGONIA)—Few, usually without paraphyses.

Vaginula—Ovate.

Capsule—Ovate, erect, with a red or purplish *Apophysis* on a red fruit stalk.

Calyptra—Conical, small.

Operculum—Convex.

Peristome—Single, composed of 16 large lanceolate obtuse yellowish teeth united in pairs.

Annulus—None.

Spores—Yellowish or green, small.

GENERAL HABITAT—In moist places, more frequent on the dung of animals or decaying substances. Fruit:—May, June, July.

SPECIES ILLUSTRATED—*Splachnum ampullaceum* (Linn.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem-leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times 1$ -in.; *d*, Marginal and midleaf cellules, $\times \frac{1}{4}$ -in.; *e*, Teeth of Peristome, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.

This genus is represented in Britain by three species.

66. GENUS TETRAPLONDON, *Bruch & Sch.*

WHOLE PLANT—Perennial, densely tufted, growing on decayed animal matter, erect, with imbricated leaves, from 3-inches to 4-inches in height.

STEM—Branched.

LEAVES—Lanceolate, with a long point obscurely serrated, or entire, concave, areolation loose, cells hexagonal, nerve reaching nearly to the apex.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Numerous, with clavate paraphyses.

Fertile Flower (ARCHEGONIA)—Few, without paraphyses.

Vaginula—Ovate.

Capsule—Oval, constricted below the mouth, colour dark red, on a long fruit stalk, neck of capsule obovate.

Calyptra—Cucullate.

Operculum—Obtuse, convex.

Peristome—Single, having 16 reddish teeth in pairs inserted below the edge of the mouth.

Annulus—Wanting.

Spores—Small, yellow.

GENERAL HABITAT—Chiefly on the mountains of England, Scotland, and Ireland in moist places, on dung, or decayed animal substances. Fruit :—May.

SPECIES ILLUSTRATED—*Tetraplodon mnioides* (Bruch and Sch.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *bb*, Portion of stem and leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times 1$ -in.; *d*, Cells of mid-leaf, $\times 1$ -in.; *dd*, Basal cells, $\times 1$ -in.; *e*, Teeth of peristome, $\times 1$ -in.; *ee*, Calyptra, $\times 1$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Same, $\times 2$ -in.; *g*, Vaginula, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by two species.

67. GENUS TAYLORIA, *Hooker.*

WHOLE PLANT—Perennial, erect, growing in very elevated situations on the ground, about $1\frac{1}{2}$ inches in height with an elongated fruit stalk.

STEM—Cæspitose, beset with radicles.

LEAVES—Spreading, lanceolate, or obovate-acuminate, serrated at the apex, nerve disappearing below the apex, areolæ lax, cells hexagonal, or oblong-quadrate.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Numerous.

Fertile Flower (ARCHEGONIA)—Few, styles slender.

Vaginula—Oblong.

Capsule—Erect, oval, with a long clavate neck on an elongated fruit stalk, colour red.

Calyptra—Mitriform.

Operculum—Conical, obtuse.

Peristome—Single, having 16 lanceolate teeth, or 32 cohering in pairs inserted below the mouth of the capsule.

Annulus—Wanting.

Spores—Small yellow.

GENERAL HABITAT—On the Scottish mountains, "Most abundant on Ben-Lawers" (Hook. Brit. Fl.). Fruit :—Autumn.

SPECIES ILLUSTRATED—*Tayloria serrata*, var. *tenuis* (Bruch and Sch.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *c*, Apex of same, $\times \frac{1}{2}$ -in.; *d*, Basal cells, $\times \frac{1}{2}$ -in.; *f*, Capsule, $\times 1$ -in.; *ff*, Same, $\times 2$ -in.; *g*, Operculum, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by the species figured.

The normal form has not been found in Britain.

68. GENUS DISSODON, *Greville.*

WHOLE PLANT—Perennial, erect, densely cæspitose, growing in patches of a dark lurid colour, fruit terminal on a long fruit stalk, height of plant from 2 inches to 4 inches, with dark radicles.

STEM—Dichotomous.

LEAVES—Oval-oblong, obtuse, concave, entire, spreading, crowded, nerve ceasing below the apex, areolation lax, resembling that of *Tayloria*.

INFLORESCENCE—Synoicous.

Barren Flower (ANTHERIDIA)—Oblong, paraphyses, subclavate.

Fertile Flower (ARCHEGONIA)—Few, styles slender, paraphyses filiform.

Vaginula—Oblong.

Capsule—Oval, erect, with a long tapering neck on a long yellow fruit stalk, colour of capsule greenish brown or olive green.

Calyptra—Submitriform, whitish.

Operculum—Conical, obtuse.

Peristome—Single, composed of 32 yellow lanceolate erect teeth, divided into 16 pairs transversely barred.

Annulus—Wanting.

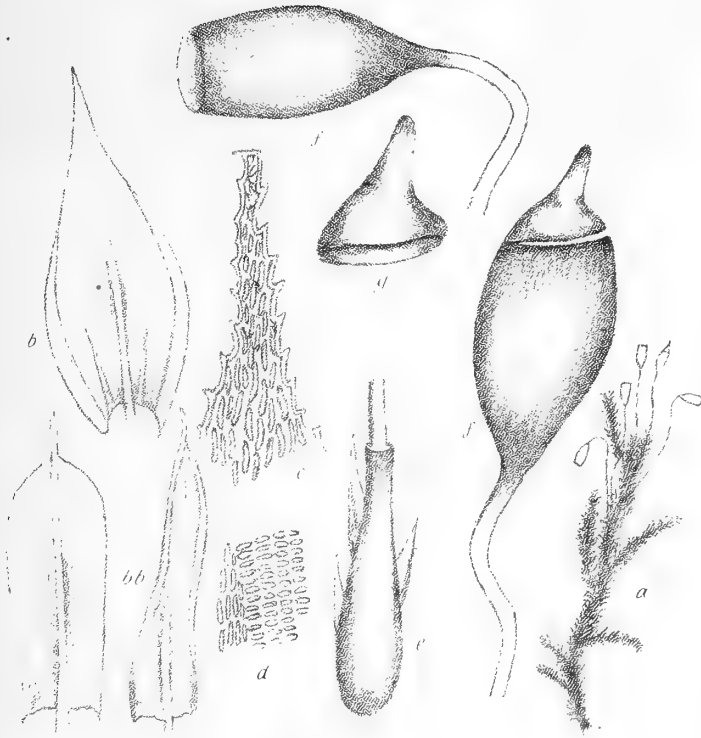
Spores—Moderate size.

GENERAL HABITAT—On the Scottish mountains in turf bogs. Fruit :—August.

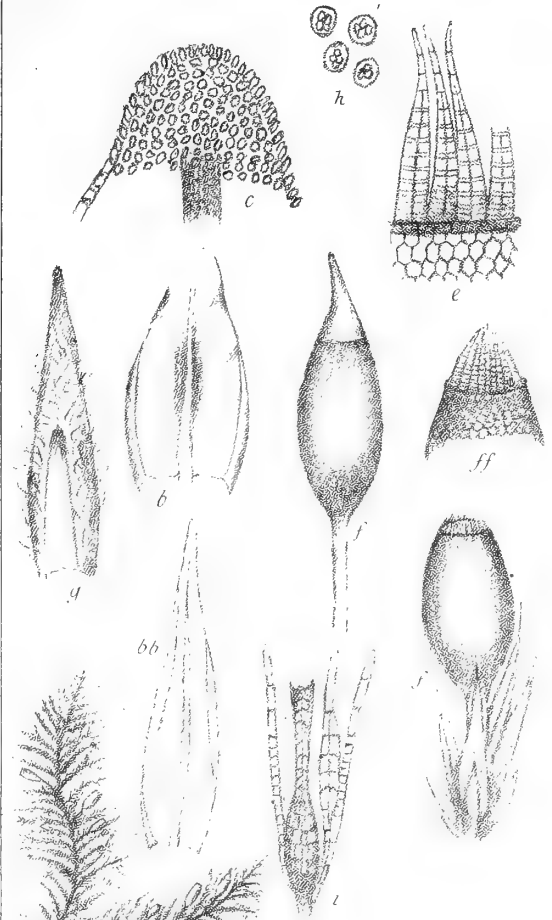
SPECIES ILLUSTRATED—*Dissodon splanchnoides* (Grev. and Arn.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *c*, Apex of same, $\times 1$ -in.; *d*, Basal cells, $\times 1$ -in.; *dd*, Marginal and mid-leaf cells, $\times 1$ -in.; *e*, Teeth of peristome, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Vaginula, $\times 2$ -in.; *gg*, Operculum, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

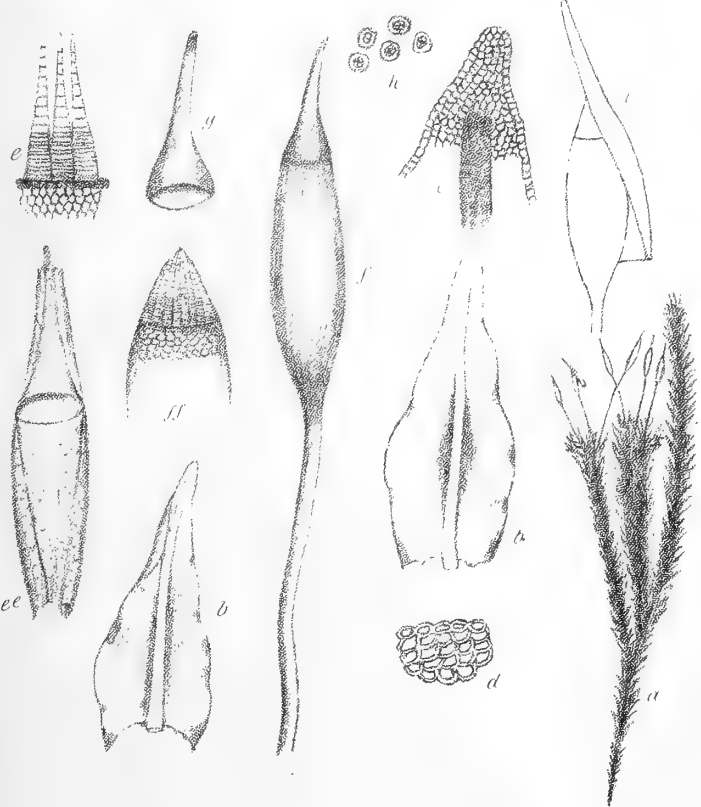
Two species are given in Bryol. Brit. and in Hobkirk's Synop. as representing this genus in Britain; but it appears very doubtful whether *D. Froelichianus* has ever been found.



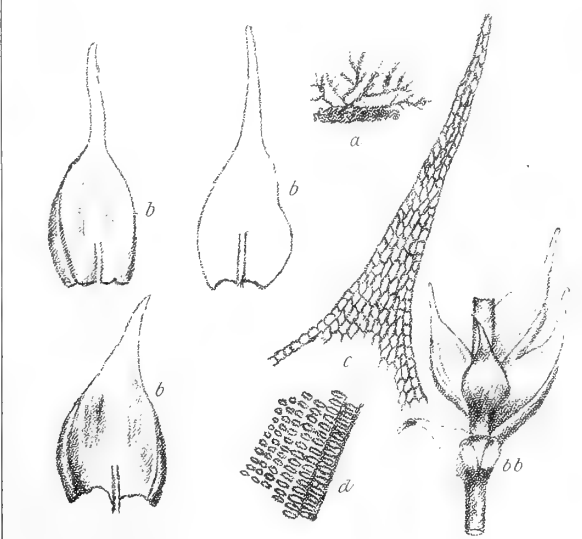
AN. FETTERICHIA



LEPTODON



ANOMODON



HABRODON

69. GENUS *ÆDIPODIUM*, Schwægr.

WHOLE PLANT—Perennial, cæspitose, or gregarious, growing in glaucous green tufts, in the crevices of rocks, about 1 inch in height; a singular plant.

STEM—Simple, scarcely any, very succulent.

LEAVES—Roundish, large, tapering and narrow towards the base, strongly reticulated, the nerve disappearing below the apex.

INFLORESCENCE—Monoicous or synoicous.

Barren Flower (ANTHERIDIA)—Oblong, large, with paraphyses.

Fertile Flower (ARCHEGONIA)—With paraphyses, styles short.

Vaginula—Oblong.

Capsule—Roundish-pyriform, with a thick succulent fruit stalk, orange-red at first, passing into golden-brown as it matures.

Calyptra—Narrow, fugacious.

Operculum—Conical.

Peristome—None.

Annulus—None.

Spores—Rather large.

GENERAL HABITAT—Crevices of rocks on the Mountains of England, Scotland, and Wales. "Not known to grow in any other country."—Bry. Brit. Fruit:—July, August.

SPECIES ILLUSTRATED—(*Ædipodium Griffithianum* (Schwægr.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *c*, Basal portion of leaf, $\times 1$ -in.; *d*, Capsule, $\times 2$ -in.

This genus is represented in Britain by the species figured.

70. GENUS *SCHISTOSTEGA*, Mohr.

WHOLE PLANT—Annual, a very elegant delicate little plant, having a confervoid appearance when young, growing in Sandstone Caves, of a bright shining green colour, about $\frac{1}{2}$ or $\frac{3}{4}$ of inch in height; fructification terminal.

STEM—Simple, crowded, very tender, naked at bottom; *fertile stem*:—leafy only at the summit, having a rosaceous tuft; *barren stem*:—shaped like the frond of a fern.

LEAVES—Oval, or lanceolate, plane, acute, nerveless, areolæ large, rhomboid, pale, glaucous green, shining.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Subsessile, gemmiform.

Fertile Flower (ARCHEGONIA)—Solitary.

Vaginula—Oblong, leafy.

Capsule—Oval or subglobose, small, erect, yellowish-brown when young, red-brown as it matures, terminal on an elongated yellow pellucid thick fruit stalk.

Calyptra—Very small, conical, or dimidiate.

Operculum—Convex.

Peristome—None.

Annulus—None, or very imperfect.

Spores—Yellowish, very minute.

GENERAL HABITAT—Sandstone, caves, moist banks in several of the Midland and North Western Counties of England. Fruit:—March.

SPECIES ILLUSTRATED—*Schistostega Osmundacea* (Web. and Mohr.) *Schistostega pennata* (Hook. and Tayl.).

Reference to Plate—*a*, Plant, natural size; *aa*, Plant, $\times 2$ -in.; *b*, Portion of stem and leaves, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cellules, $\times \frac{1}{2}$ -in.; *f*, Capsules, $\times 1$ -in.

This genus is represented in Britain by the species figured.

"The only genus of this beautiful and singular family."

71. GENUS *FISSIDENS*, Hedw.

WHOLE PLANT—Perennial, suberect, or decumbent, cæspitose, or gregarious, frond-like, bright or brownish-green, growing on rocks, or on the ground, height from $\frac{1}{4}$ inch to 2 or 3 inches.

STEM—Branched, erect, or decumbent, more or less fasciulate.

LEAVES—Distichous, alternately inserted on opposite sides of the stem, distant, ovate-lanceolate, more or less acute; nerve ceasing at or near the apex; areolæ opaque, filled with chlorophyll.

INFLORESCENCE—Monoicous or dioicous.

Barren Flower (ANTHERIDIA)—Few } Paraphyses none.

Fertile Flower (ARCHEGONIA)—Few }

Vaginula—Oblong.

Capsule—Erect, or cernuous, oblong, red-brown, on a long fruit stalk.

Calyptra—Cucullate, or dimidiate.

Operculum—Rostellate, or conical.

Peristome—Single, red, lanceolate at the base.

Annulus—Obscure.

Spores—Small, smooth.

GENERAL HABITAT—Shady banks by the sides of ditches in a clayey soil, moist rocks in mountainous districts. Fruit:—Spring, winter.

SPECIES ILLUSTRATED—*Fissidens bryoides* (Hedw.).

Reference to Plate—*a*, Plant, natural size; *aa*, Plant, $\times 2$ -in.; *b*, Stem-leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in. *f*, Capsule, $\times 1$ -in.; *ff*, Teeth of Peristome, $\times \frac{1}{4}$ -in.; *g*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by twelve species, according to Hobkirk. Wilson enumerates eight.

72. GENUS ANÆCTANGIUM, *Br. & Sch.*

WHOLE PLANT—Perennial, fructification lateral, growing in brown or lurid tufts when young, yellowish-green, from 2 inches to 4 inches in height.

STEM—Erect, slender, dichotomously branched.

LEAVES—Lanceolate, crowded, somewhat spreading, margin plane, faintly denticulate at the upper part of the leaf, entire at the base; nerve pellucid, reaching nearly to the apex; areolæ round, small, dot-like in the centre and upper portion of the leaf, opaque, elongate at the base.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Few, paraphyses filiform.

Fertile Flower (ARCHEGONIA)—Slender.

Vaginula—Cylindrical.

Capsule—Ovate-oblong, erect, yellowish-brown, on a pale slender fruit stalk, mouth bright red.

Calyptra—Cucullate, subulate.

Operculum—Convex, with a long oblique beak.

Peristome—None.

Annulus—None, or very small.

Spores—Minute, reddish.

GENERAL HABITAT—Wet rocks near waterfalls. Fruit:—Autumn.

SPECIES ILLUSTRATED—*Anæctangium compactum* (Schwægr.). *Gymnostomum æstivum* (Hook. and Tayl.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaves, $\times 1$ -in.; *bb*, Branch leaf, $\times 1$ -in.; *c*, Apex of stem leaf, $\times \frac{1}{4}$ -in.; *d*, Central cells of leaf, $\times \frac{1}{4}$ -in.; *dd*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Operculum, $\times 1$ -in.; *f*, Capsule with calyptra, 2-in.; *ff*, Capsule, $\times 1$ -in.

This genus is represented in Britain by two species, according to Hobkirk and Wilson.

Both these authors are agreed as to the second species being very doubtful as British. Mr. Mitten refers it to *Tortula Hibernica*.

73. GENUS LEUCODON, *Schwægr.*

WHOLE PLANT—Perennial, creeping, with erect branches and lateral fruit, dark green, height of branch about 1 inch.

STEM—Creeping, from 1 inch to $1\frac{1}{2}$ inches long, branches erect.

LEAVES—Ovate, plicate, entire, densely imbricated, nerveless, areolæ round, small near the margin, elongated, narrow in the centre, dark green.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—

Fertile Flower (ARCHEGONIA)—

Vaginula—Cylindrical, curved.

Capsule—Erect, oblong, smooth, reddish-brown.

Calyptra—Cucullate, large.

Operculum—Conical.

Peristome—Single, composed of 16 yellow, linear, erect teeth.

Annulus—"Fragmentary."

Spores—Large, greenish-yellow.

GENERAL HABITAT—On trees, walls, rails and rocks; very rarely found in fruit, but has been met with in Sussex, the New Forest, and Yorkshire. Fruit:—November.

SPECIES ILLUSTRATED—*Leucodon sciuroides* (Schwægr.).

Reference to Plate—*a*, Plant, natural size; *b*, Leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Marginal and central cells $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Portion of same, $\times 1$ -in.; *g*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *h*, Spores $\times \frac{1}{4}$ -in.

This genus is represented in Britain by two species.

74. GENUS ANTITRICHIA, *Bridel.*

WHOLE PLANT—Perennial, procumbent, with ascending branches, fruit lateral, on a short curved seta, yellowish-green or dark green, affecting mountainous districts.

STEM—Straggling, procumbent, from 2 inches to 8 inches or more in length, with spreading branches.

LEAVES—Concave, ovate, erect, singularly serrated at the narrow apex, which is terminated with a hook, nerve trifid, areolæ elongated, small in the central and upper portions of the leaf, dot-like at the margin.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform, axillary.

Fertile Flower (ARCHEGONIA)—

Vaginula—Clavate.

Capsule—Oval, drooping, or erect, yellowish-brown, on a curved fruit stalk.

Calyptra—Cucullate, large.

Operculum—Conical.

Peristome—Double, composed of 16 yellow lanceolate outer teeth, and 16 narrow inner ones, united at the base.

Annulus—None.

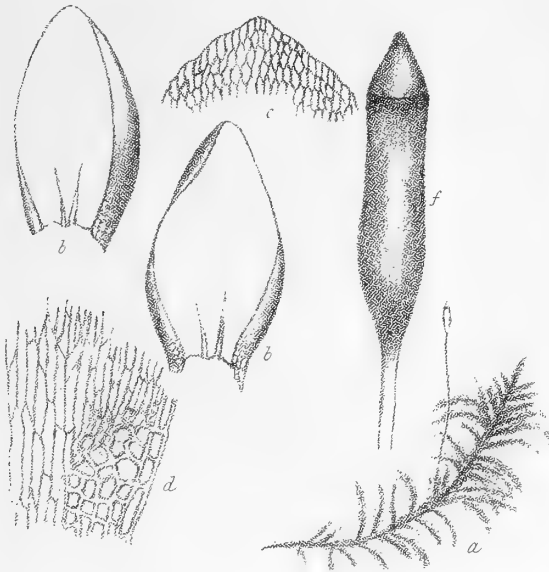
Spores—Large.

GENERAL HABITAT—Upon trees and rocks, in mountainous countries. Fruit:—April.

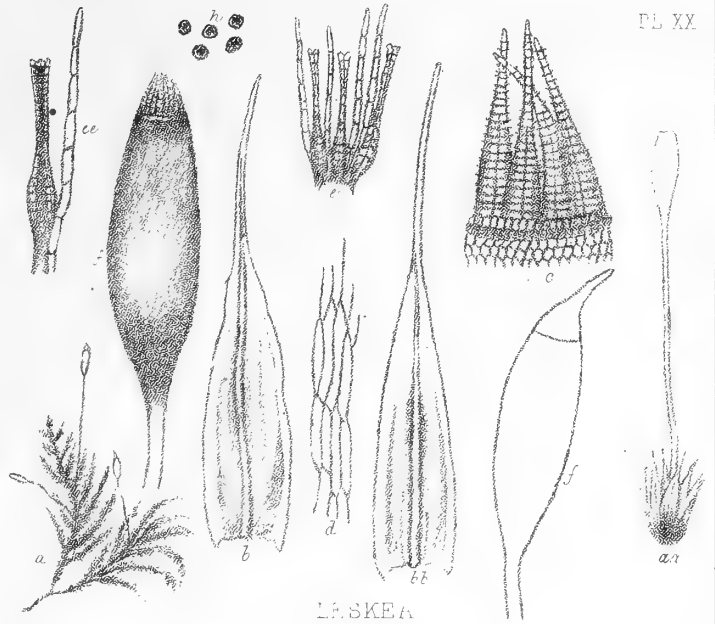
SPECIES ILLUSTRATED—*Antitrichia curtispindula* (Bridel). *Anomodon curtispindulus* (Hook. and Tayl.)

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *bb*, Perichætal leaves, $\times 2$ -in.; *c*, Apex of stem leaf, $\times \frac{1}{4}$ -in.; *d*, Central and marginal cells of leaf, $\times \frac{1}{4}$ -in.; *e*, Vaginula, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Operculum, $\times 1$ -in.

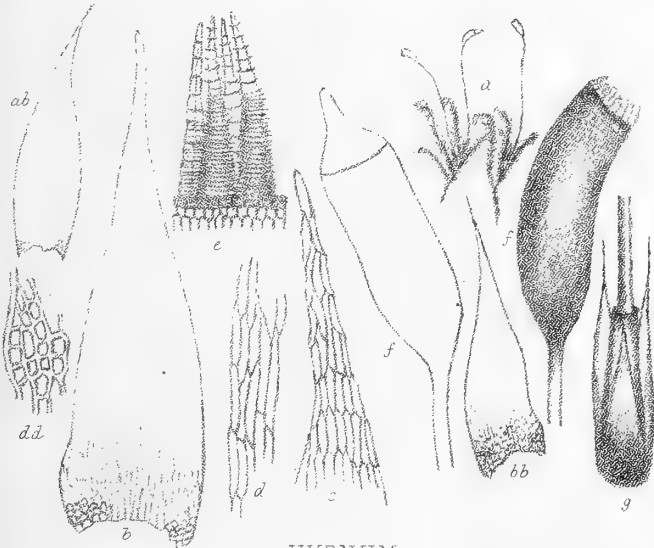
This genus is represented in Britain by the species figured.



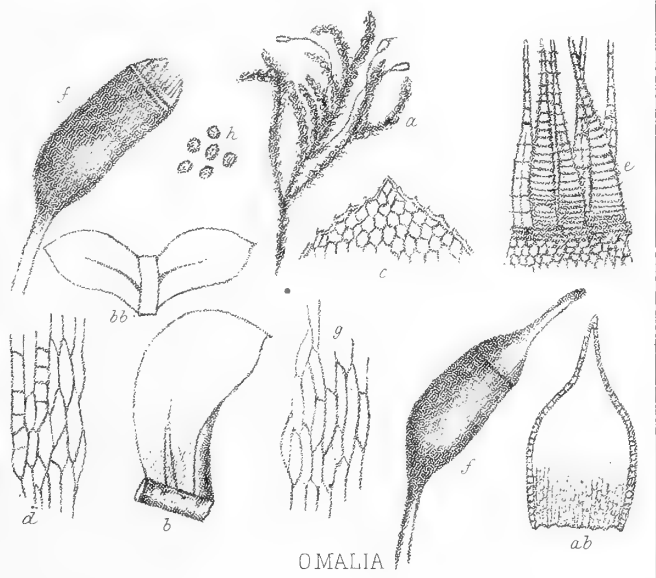
CYLINDROTHECIUM



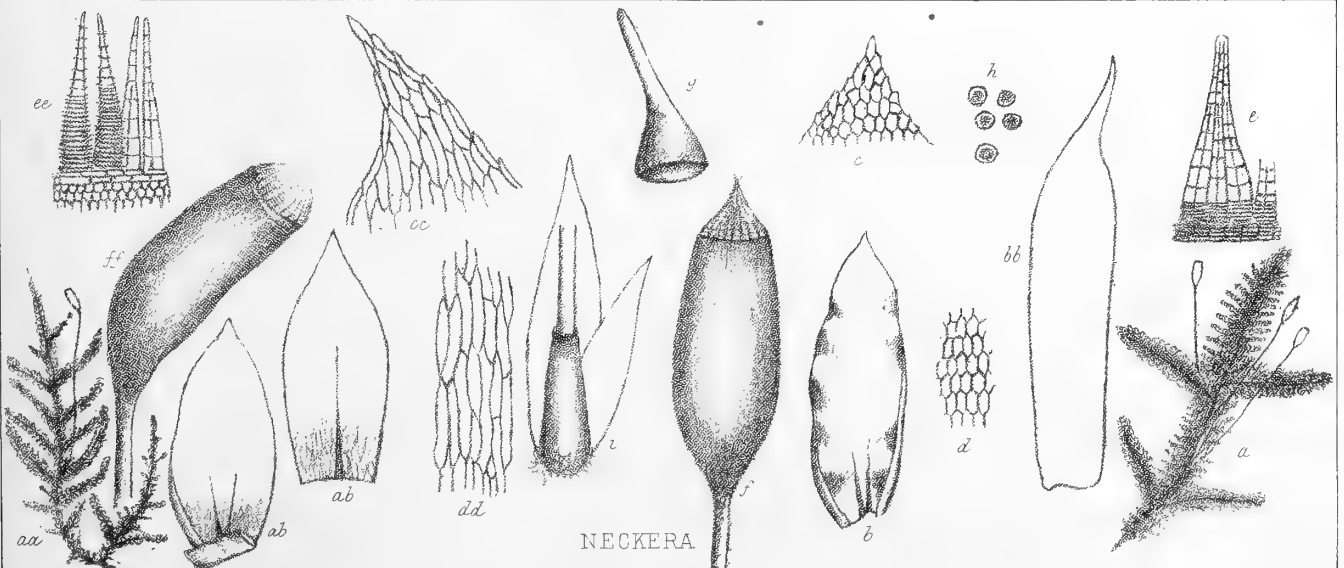
LASKEA



HYPNUM.



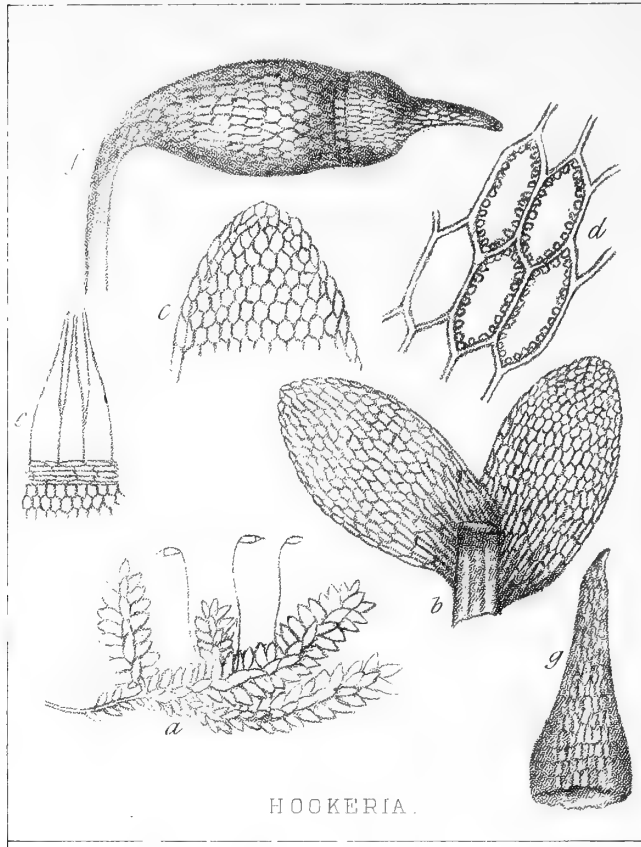
OMALIA



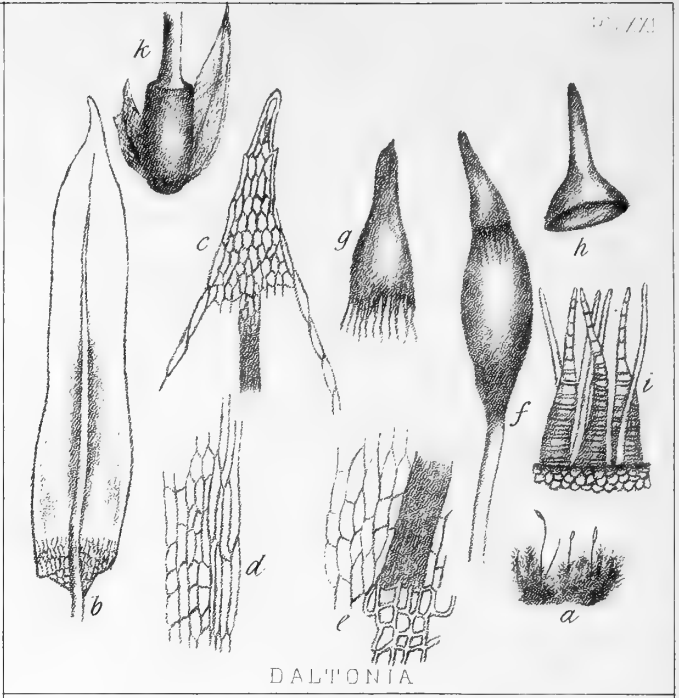
NECKERA



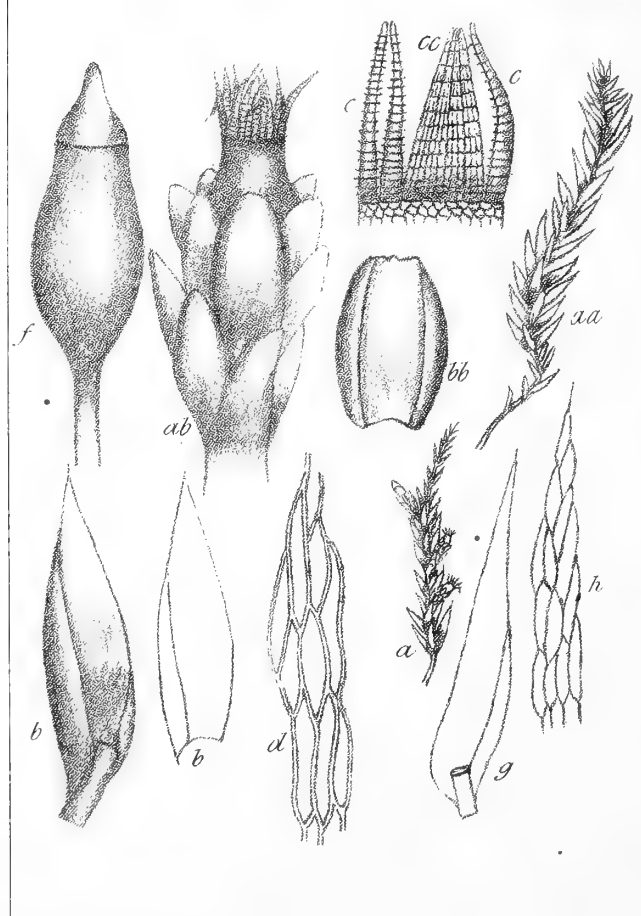




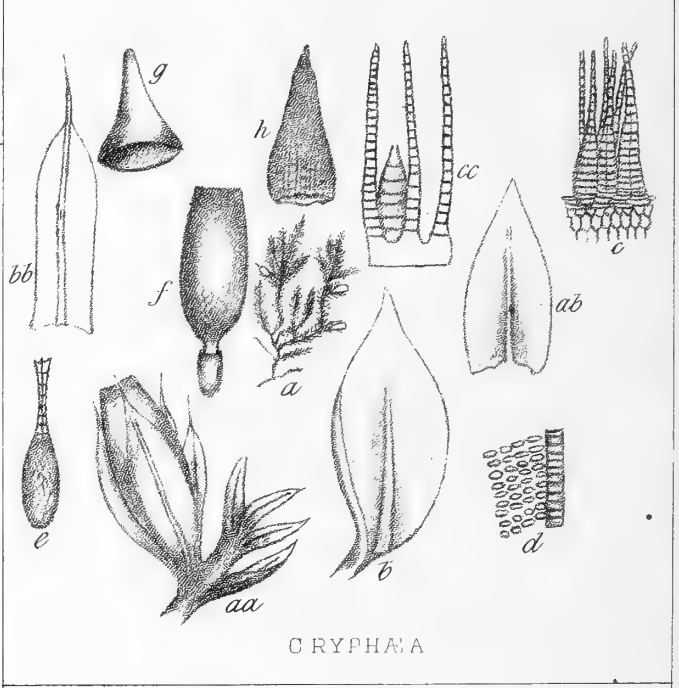
HOOKERIA.



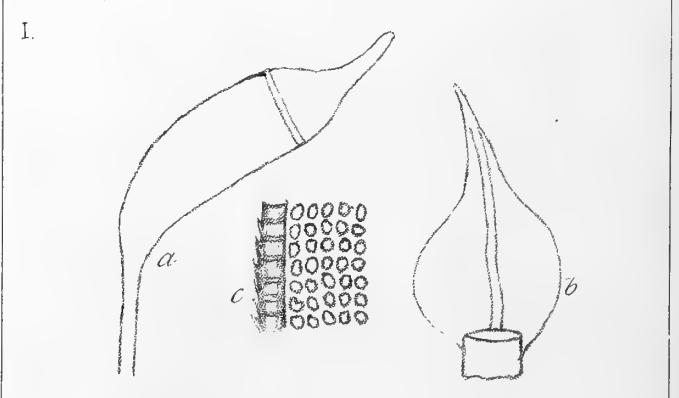
DALTONIA



FONTINALIS



CRYPTA



THUIDIUM

75. GENUS LEPTODON, *Bridel.*

WHOLE PLANT—Perennial, creeping, with crowded incurved branches, which almost conceal the fruit.

STEM—Creeping, with pinnate branches, length from 1 inch to 3 inches.

LEAVES—Ovate, round and obtuse at the apex, nerve reaching nearly to the apex, areolæ small, round, dot-like. Perichæ-
tial leaves erect, lanceolate.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA).

Fertile Flower (ARCHEGONIA)—Few, with filiform paraphyses.

Vaginula—Oblong, hairy.

Capsule—Oval, on a short fruit stalk, red-brown.

Calyptra—Cucullate, very hairy, yellowish.

Operculum—Conical at the base.

Peristome—Single, composed of 16 red lanceolate teeth with a distinct medial line.

Annulus—None.

Spores—Large, greenish.

GENERAL HABITAT—Growing on the bark of trees. Fruit:—April.

SPECIES ILLUSTRATED—*Leptodon Smithii* (Bridel), *Pterogonium Smithii*, Hook. and Tayl. (tab. xiv.)

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *bb*, Perichæ-
tial leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.;
e, Teeth of peristome, $\times \frac{1}{4}$ -in.; *f*, Capsule with Perichæ-
tial leaves, $\times 2$ -in.; *ff*, Portion of capsule and peristome, $\times 1$ -in.; *g*, Calyptra, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, Arche-
gonia and paraphyses, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

76. GENUS ANOMODON, *Hook & Tayl.*

WHOLE PLANT—Perennial, erect branched; from 2 inches to 3 inches in height, light green when young, fruit lateral.

STEM—Simple, loosely tufted, erect, irregularly branched.

LEAVES—Ovate, lanceolate, obtuse or pointed, entire, nerve pellucid, reaching nearly to the apex, areolæ, small, round, or
quadrate, opaque.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA)—Gemmiform.

Vaginula—Oblong.

Capsule—Erect, cylindrical, bright chesnut brown colour, on an upright fruit stalk.

Calyptra—Dimidiate membranous, pale.

Operculum—Conical at the base, with a rostellate beak.

Peristome—Double, composed of 16 yellow lanceolate outer teeth, and 16 short ciliary processes, adhering to
the inner teeth.

Annulus—Small.

Spores—Small, yellow.

GENERAL HABITAT—On trees and rocks. Fruit:—Autumn.

SPECIES ILLUSTRATED—*Anomodon viticulosus* (Hook. and Tayl.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Central cells, $\times \frac{1}{4}$ -in.;
e, Teeth of peristome, $\times \frac{1}{4}$ -in.; *ee*, Calyptra, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *ff*, Portion of Capsule,
 $\times 1$ -in.; *g*, Operculum, $\times 1$ in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by three species.

77. GENUS HABRODON, *Schp.*

WHOLE PLANT—Small, creeping, with irregular erect branches; colour of plant dark green; growing on the bark of trees
or bushes; about $\frac{1}{2}$ -in. in height.

STEM—Sub-erect or creeping, branched.

LEAVES—Imbricated, entire, acuminate, nerve short or nerveless, areolation opaque, cells small, quadrate at the apex, round
or dot-like in the centre and base of leaf, marginal cells quadrate or oval, dark green.

INFLORESCENCE—"Dioicous."

Barren Flower (ANTHERIDIA).

Fertile Flower (ARCHEGONIA).

Vaginula.

Capsule—"Oval-oblong, erect, striate."

Calyptra—"Large."

Operculum—"Conical erose."

Peristome—"Single, teeth 16, simple, linear, inserted below the mouth of the capsule" (Hobkirk's Synop., pp. 17).

Annulus.

Spores.

GENERAL HABITAT—"Trunks of elm or white thorn." Fruit:—

SPECIES ILLUSTRATED—*Habrodon Notarisii* (Schimper), *Clasmatodon perpusillus* (Lindberg).

Reference to Plate—*a*, Plant, natural size; *b*, Leaves, $\times 1$ -in.; *bb*, Portion of branch and leaves, $\times 2$ -in.; *c*, Apex of
leaf, $\times \frac{1}{4}$ -in.; *d*, Central and marginal cells of leaf, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

78. GENUS PTEROGONIUM, *Swartz.*

WHOLE PLANT—Perennial, erect, slender, tufted, branched, arched, naked below, light or yellowish green, from 1 inch to 2 inches in height.

STEM—Slender, with fasciculate filiform branches arched above, naked below.

LEAVES—Ovate, imbricated, spreading, concave, acuminate, yellowish-green, glossy, margin plane at the centre and base of leaf, apex serrated, two nerved, short; areolæ small, elliptical, or hexagonal.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)— } Gemmiform.
Fertile Flower (ARCHEGONIA)— }

Vaginula—Oblong.

Capsule—Erect, oblong, reddish-brown, on a long slender fruit stalk.

Calyptra—Cucullate, sometimes slightly hairy.

Operculum—Conical at the base, beak oblique.

Peristome—Double, composed of 16 outer pale yellow lanceolate teeth, trabeculated, and 16 inner narrow processes.

Annulus—Fragmentary, obscure.

Spores—Small.

GENERAL HABITAT—On walls, shady rocks, and the bark of trees in mountainous districts; rare in fruit. Fruit:—Spring and Autumn.

SPECIES ILLUSTRATED—*Pterogonium gracile* (Swartz), and *Pterogonium filiforme* (Hedw.)—in part.

Reference to Plate—*a*, Plant, natural size; *P. gracile*, *b*, Stem leaves, $\times 1$ -in.; *c*, Apex of leaf, same, $\times \frac{1}{2}$ -in.; *d*, Central cells of leaf of same, $\times \frac{1}{4}$ -in.; *f*, Capsule of same, $\times 2$ -in.; *ff*, Capsule, $\times 2$ -in.; *g*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *P. filiforme*, *bb*, Stem leaf, $\times 1$ -in.; *cc*, Apex of leaf, $\times \frac{1}{2}$ -in.; *dd*, Central cellules of leaf, $\times \frac{1}{4}$ -in.; *ff*, Capsule and Operculum, $\times 2$ -in.

This genus is represented in Britain by two species.

79. GENUS ISOTHECIUM, *Bridel.*

WHOLE PLANT—Perennial, growing in tufts on trunks or branches of trees, fruiting freely; colour yellowish-green; from 1 inch to 2 inches in height.

STEM—Somewhat dendroid from a creeping rhizome with incurved fasciculate branches.

LEAVES—Ovate-lanceolate, or ovate-oblong, concave, more or less acute, serrated at the apex, nerve single or forked, reaching almost to the apex, areolæ elliptical. Perichæatial leaves ovate, acuminate, erect.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Gemmiform, axillary.

Fertile Flower (ARCHEGONIA).

Vaginula—Oblong.

Capsule—Erect, symmetrical, slightly bent, reddish-brown, on a curved elongated fruit stalk.

Calyptra—Cucullate.

Operculum—Conical, with an oblique beak.

Peristome—Double, composed of 16 outer pellucid yellow teeth, having a medial line; inner teeth frequently absent.

Annulus—"Dehiscent."

Spores—Small, yellow.

GENERAL HABITAT—On rocks and trunks of trees, not uncommon. Fruit:—October and November.

SPECIES ILLUSTRATED—*Isothecium myurum* (Bridel), *Hypnum curvatum* (Swartz).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *bb*, Perichæatial leaf, $\times 1$ -in.; *c*, Apex of stem leaf, $\times \frac{1}{2}$ -in. *d*, Central and basal cellules, $\times \frac{1}{4}$ -in.; *e*, Outer and inner teeth of Peristome, $\times \frac{1}{4}$ -in.; *f*, Capsules, $\times 1$ -in.; *g*, Operculum, $\times \frac{1}{2}$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, *Vaginula*, $\times 1$ -in.

This genus is represented in Britain (according to Hobkirk) by the species figured. Wilson, in "Bry. Brit.," enumerates three species, which include *Eurynchium myosuroides* (Schmp.), and *Thamnium alopecurum* (Schmp.).—See Plate XXII.

80. GENUS CLIMACIUM, *W. & Morh.*

WHOLE PLANT—Perennial, erect, shrub-like, terminated with a tuft of branches, bearing numerous capsules, which arise from their base on long fruit stalks, from 3 inches to 4 inches in height.

STEM—Tall, erect, lower part bare of branches, thickly branched at the summit; colour yellowish-green.

LEAVES—Small and scale-like on the stem, branch leaves ovate-lanceolate, plicate, concave, nerve reaching nearly to the summit, slightly serratulate at the apex, areolæ hexagonal above, elongate, narrow at the base. Perichæatial leaves lanceolate, nerveless, entire.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)— } Gemmiform.
Fertile Flower (ARCHEGONIA)— }

Vaginula—Oblong.

Capsule—Erect, cylindrical, on a long fruit stalk; colour bright chesnut.

Calyptra—Dimidiate.

Operculum—Conical, erect.

Peristome—Double, composed of 16 long red lanceolate, trabeculated outer teeth with a medial line, and 16 linear yellow inner ones.

Annulus—None.

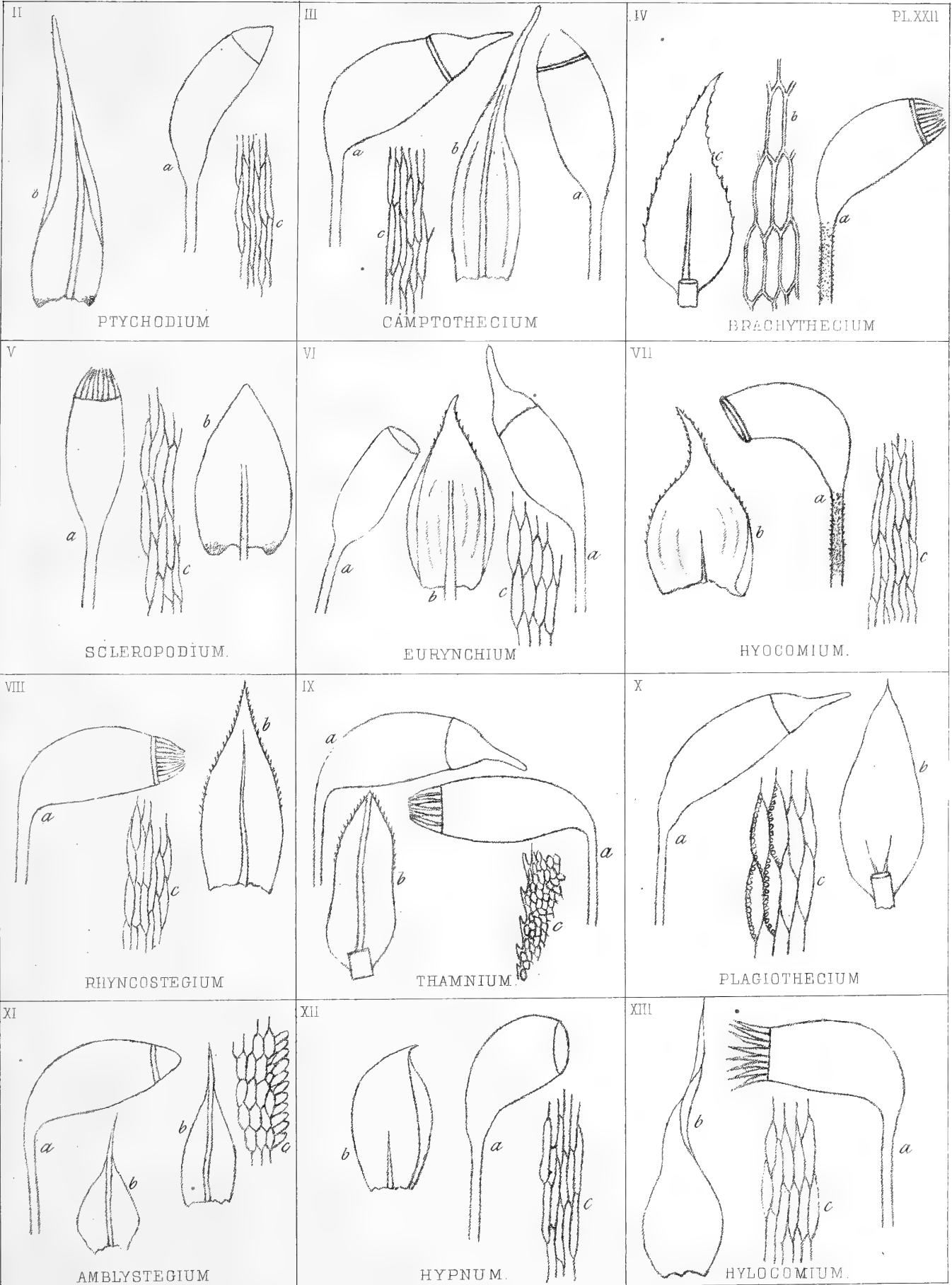
Spores—Very small, greenish-yellow.

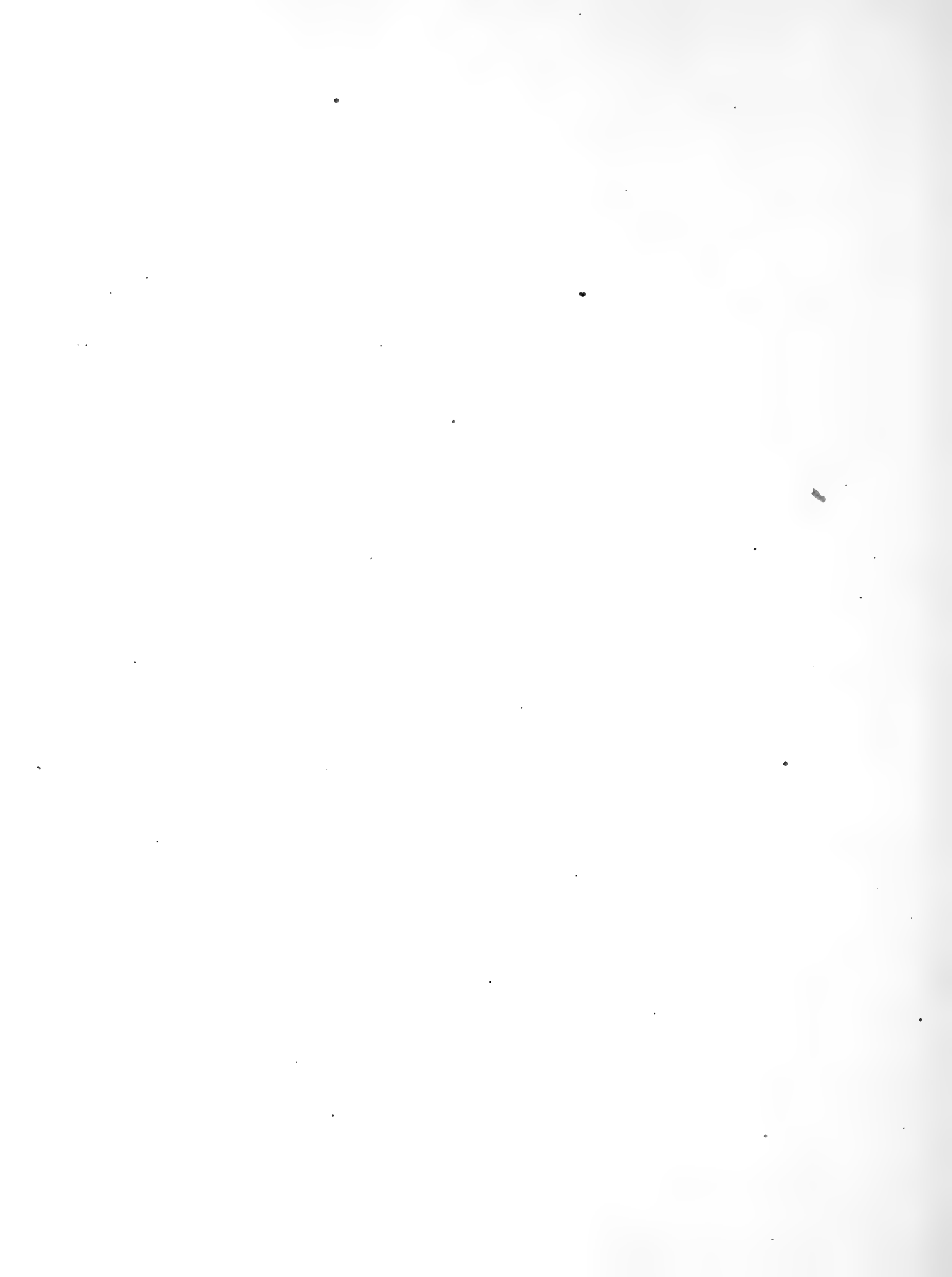
GENERAL HABITAT—Damp meadows and shady places and the borders of bogs. Fruit rather uncommon.—October, November.

SPECIES ILLUSTRATED—*Climacium dendroides* (Web. and Morh.)

Reference to Plate—*a*, Plant, natural size; *aa*, *Vaginula* and perichæatial leaves, $\times 2$ -in.; *b*, Branch leaves, $\times 1$ -in.; *bb*, Perichæatial leaf, $\times 2$ -in.; *c*, Apex of stem leaf, $\times \frac{1}{2}$ -in.; *d*, Mid-leaf cellules, $\times \frac{1}{4}$ -in.; *dd*, Basal cellules, $\times \frac{1}{4}$ -in.; *e*, Outer and inner teeth of peristome, $\times \frac{1}{2}$ -in.; *ee*, same, $\times \frac{1}{4}$ -in.; *f*, Capsules, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.





81. GENUS CYLINDROTHECIUM, *Bry. Eur.*

WHOLE PLANT—Decumbent, growing in yellowish brown patches, with pinnated branches.

STEM—Decumbent, having numerous short, acute, recurved, cuspidate branches, varying from 2 inches or more in length.

LEAVES—Shining, ovate, obtuse, entire, concave, faintly two-nerved at the base, areolæ oblong, basal cells quadrate, pellucid.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)— } Gemmiform, axillary.
Fertile Flower (ARCHEGONIA)— }

Vaginula—Oblong, leafy.

Capsule—Cylindrical, erect, on a straight fruit stalk, chestnut red.

Calyptra—Dimidiate.

Operculum—Conical.

Peristome—Double, with 16 outer lanceolate red teeth, with prominent external cross bars, inner ones 16 alternating, having a medial line.

Annulus—Sometimes wanting, faint yellow.

Spores—Small.

GENERAL HABITAT—On hills in chalky districts, Ben Lawers, Welburn, and Wolstonbury, Sussex. Fruit:—

SPECIES ILLUSTRATED—*Cylindrothecium Montagnei*, *Entodon insidiosus*, (*Bry. Eur.*).

Reference to Plate—*a*, Plant, natural size; *b*, Leaves, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Basal cells, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.

This genus is represented in Britain by the species figured. The fruit has not been found in Britain. Dissections are more fully given in a Supplementary Plate drawn from foreign specimens.

82. GENUS LESKEA, *Hedwig.*

WHOLE PLANT—Perennial, creeping on the trunks and roots of trees, walls and rocks, branched, colour yellowish or bright green, varying in length from $\frac{1}{4}$ to 2 inches; fruit lateral from the lower part of stem.

STEM—Creeping, with irregular branches, which are simple and usually erect.

LEAVES—Ovate, or ovate-lanceolate, tapering to a point, entire, nerved or nerveless, areolæ narrow, elongated.

INFLORESCENCE—Dioicous, or monoicous.

Barren Flower (ANTHERIDIA)—Axillary gemmiform.

Fertile Flower (ARCHEGONIA)—Axillary on the stem, with filiform paraphyses.

Vaginula—Cylindrical.

Capsule—Erect, ovate-cylindrical, on a long straight fruit stalk, colour reddish-brown.

Calyptra—Dimidiate.

Operculum—Conical, with a short oblong beak.

Peristome—Double, composed of 16 outer lanceolate, trabeculated, red teeth; inner teeth 16, yellowish processes.

Annulus—Obscure.

Spores—Small, yellowish.

GENERAL HABITAT—On the trunks and roots of trees, walls and rocks. Fruit:—Spring, Summer, and Winter.

SPECIES ILLUSTRATED—*Leskea sericea* (*Hedw. Dill.*), *Hypnum sericeum* (*Hook. and Tayl.*).

Reference to Plate—*a*, Plant, natural size; *aa*, Capsule, slightly magnified; *b*, Stem leaf, $\times 2$ -in.; *bb*, Perichaetial leaf, $\times 2$ -in.; *c*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *d*, Cellules of leaf, $\times \frac{1}{4}$ -in.; *f*, Capsules, $\times 2$ -in.; *e*, Archegonia and paraphyses, $\times 1$ -in.; *ee*, Archegonia, $\times \frac{1}{4}$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by nine species.

83. GENUS HYPNUM, *Dill. Hedw.*

WHOLE PLANT—Perennial, varying greatly in size and habit, erect or procumbent, colour yellowish-green, pale or dull green, from $\frac{1}{2}$ an inch to 6 inches or more in height. Capsules erect, curved.

STEM—Generally creeping, caespitose, with erect or horizontal branches.

LEAVES—Ovate, or ovate lanceolate, very variable, serrated or entire, of firm texture, nerved or nerveless, nerve variable in length, areolæ narrow and elongated, in some species quadrate or hexagonal at the base.

INFLORESCENCE—Dioicous or monoicous.

Barren Flower (ANTHERIDIA)—Axillary, ovate, mixed with filiform paraphyses.

Fertile Flower (ARCHEGONIA)—Styles long, mixed with long filiform paraphyses.

Vaginula—Cylindrical, leafy at the base.

Capsule—Erect, cernuous, mostly of a rich brown colour, on a long smooth or rough fruit stalk.

Calyptra—Cucullate, small.

Operculum—Conical.

Peristome—Double, composed of 16 reddish-brown or yellowish teeth, equidistant, lanceolate, trabeculated, inner teeth 16, composed of carinate processes.

Annulus—Large or small.

Spores—Variable in size, yellow or reddish.

GENERAL HABITAT—In bogs, marshes, on the trunks and roots of trees, walls, stones, rocks, and sandy banks. Fruit:—Spring and Winter.

SPECIES ILLUSTRATED—*Hypnum cupressiforme* (*Dill. Linn.*).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *ab*, Same, $\times 2$ -in.; *bb*, Perichaetial leaf, $\times 2$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Mid-leaf cells, $\times \frac{1}{4}$ -in.; *dd*, Basal cells, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Vaginula, $\times 2$ -in.

This genus is now divided into 13 sub-genera. For figures see Plate xxiii, and for descriptions I must refer the Student to *Hobkirk's Synopsis*.

84. GENUS OMALIA, *Bridel.*

WHOLE PLANT—Perennial, creeping, rigid, with curved branches, about an inch in length.

STEM—Subpinnate, branched.

LEAVES—Broad, scimitar-shape, complanate, obtuse with a very short point; serratulate at the apex, nerve faint, short areolæ narrow, oblong at the middle and lower part, hexagonal at the apex.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA).

Fertile Flower (ARCHEGONIA).

Vaginula—Obclavate.

Capsule—Ovate, sub-erect, on a somewhat long fruit stalk, colour yellowish-brown.

Calyptra—Cucullate.

Operculum—Conical, rostrate.

Peristome—Double, composed of 16 outer reddish teeth; inner one 16, with equal segments.

Annulus—None, or very obscure.

Spores—Small, yellowish.

GENERAL HABITAT—On trunks of trees and on rocks. Fruit:—October, November.

SPECIES ILLUSTRATED—*Omalia trichomanoides* (Dill.), *Hypnum trichomanoides* (Linn.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem-leaf, $\times 1$ -in.; *bb*, Leaves and portion of stem, $\times 2$ -in.; *ab*, Perichæatial leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Perichæatial leaf cells, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times 1$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Stem leaf-cells, $\times \frac{1}{4}$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by the species figured.

85. GENUS NECKERA.

WHOLE PLANT—Perennial, very handsome and elegant plants, growing on walls, rocks, and the trunks of trees, horizontally, varying from 1 inch to 4 or 6 inches in length.

STEM—Creeping, branches short.

LEAVES—Complanate, ovate-oblong, crowded, undulated generally, glossy, slightly serrated at the apex, somewhat obtuse or apiculate, two-nerved or single nerved, areolæ oblong or hexagonal.

INFLORESCENCE—Dioicous, or monoicous.

Barren Flower (ANTHERIDIA)— } Axillary.
Fertile Flower (ARCHEGONIA)— }

Vaginula—Obclavate.

Capsule—Erect, or slightly bending, roundish-ovate or elliptical of a yellowish-brown or reddish colour.

Calyptra—Cucullate, or dimidiate.

Operculum—Conical at the base, rostrate.

Peristome—Double, composed of 16 outer pale yellowish teeth, with a medial line, and 16 inner teeth.

Annulus—None.

Spores—Large, yellowish, smooth or granular.

GENERAL HABITAT—On calcareous rocks, walls, trunks of trees, &c. Fruit:—October, November, and December.

SPECIES ILLUSTRATED—*Neckera crispa* (Dill. Hedw.), *Neckera complanata* (Bry. Europ.)—in part.

Reference to Plate—*Neckera crispa*, *a*, Plant natural size; *b*, Stem-leaf, $\times 2$ -in.; *bb*, Perichæatial leaf, $\times 2$ -in.; *c*, Apex of stem-leaf, $\times \frac{1}{4}$ -in.; *d*, Cells of same, $\times \frac{1}{4}$ -in.; *e*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *f*, Capsules, $\times 2$ -in.; *g*, Operculum, $\times 2$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, Vaginula, $\times 2$ -in. *Neckera complanata*, *aa*, Plant natural size; *bb*, Stem leaves, $\times 2$ -in.; *cc*, Apex of same, $\times \frac{1}{4}$ -in.; *dd*, Cells of same, $\times \frac{1}{4}$ -in.; *ee*, Teeth of peristome, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by five species.

86. GENUS HOOKERIA, *Smith.*

WHOLE PLANT—Perennial, sub-erect or procumbent, succulent, affecting wet shady places on the ground, of a pale shining green colour, from 1 inch to 3 inches in length.

STEM—Stout, procumbent, sparingly branched, brittle.

LEAVES—Imbricated, large, pellucid, oval, bright, pale green, shining, obtuse, reticulated, entire, nerveless, areolæ large, hexagonal.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA).

Fertile Flower (ARCHEGONIA).

Vaginula—Cylindrical, short.

Capsule—Ovate, horizontal, reticulated, on an upright fruit stalk; colour, red brown.

Calyptra—Conical, reticulated.

Operculum—Round, rostrate.

Peristome—Double, having 16 reddish-brown outer teeth, and 16 inner carinated processes.

Annulus—Wanting.

Spores—Small, yellowish-green.

GENERAL HABITAT—Shady places on moist banks by rivulets, and on wet rocks. Fruit:—November and December.

SPECIES ILLUSTRATED—*Hookeria lucens* (Dill. Linn.).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaves, $\times 2$ -in.; *c*, Apex of same, $\times 1$ -in.; *d*, Cells of mid-leaf, $\times \frac{1}{4}$ -in.; *e*, Teeth of Peristome, $\times 1$ -in.; *f*, Capsule, with Operculum, $\times 1$ -in.; *g*, Calyptra, $\times 1$ -in.

This genus is represented in Britain by two species.

87. GENUS DALTONIA, *Brid.*

WHOLE PLANT—Perennial, small, erect, branched; growing in large dark green tufts, about $\frac{1}{2}$ an inch in height.

STEM—Erect, branched, branches fastigiate.

LEAVES—Spreading, crowded, lanceolate, carinate, dark green, nerve reaching nearly to the apex; areolæ rhomboid in the centre, basal and marginal cells elongated. Perichæatial leaves much smaller.

INFLORESCENCE—"Synoicous or monoicous."

Barren Flower (ANTHERIDIA)

Fertile Flower (ARCHEGONIA)

Vaginula—Cylindrical.

Capsule—Oval-oblong, with a short neck, erect, colour purplish brown, on a partially rough fruit stalk.

Calyptra—Conico-mitriform, fringed at the base.

Operculum—Conico-rostrate.

Peristome—Double, composed of 16 long, subulate pale yellow teeth, trabeculated; inner teeth divided into 16 narrow, slender processes.

Annulus—None.

Spores—Very small, yellow.

GENERAL HABITAT—On moist shady rocks, or near rills on the mountains in Ireland. Fruit:—October, November.

SPECIES ILLUSTRATED—*Daltonia splachnoides* (Hook. and Tayl.), *Hookeria splachnoides* (Taylor).

Reference to Plate—*a*, Plant, natural size; *b*, Stem leaf, $\times 1$ -in.; *c*, Apex of leaf, $\times \frac{1}{4}$ -in.; *d*, Cells of mid leaf, $\times \frac{1}{4}$ -in.; *e*, Basal cells, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 1$ -in.; *g*, Calyptra, $\times 1\frac{1}{2}$ -in.; *h*, Operculum, $\times 1\frac{1}{2}$ -in.; *i*, Teeth of Peristome, outer and inner, $\times \frac{1}{4}$ -in.; *k*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by the species figured.

88. GENUS CRYPHÆA, *Mohr. Bridel.*

WHOLE PLANT—Perennial, decumbent, creeping, branched, branches erect, dark dull, or yellowish green, about an inch in length.

STEM—Creeping from a rhizome, branches bare at the lower part.

LEAVES—Ovate, imbricated, pointed, entire, margin recurved, nerve thick, reaching above half way; areolæ oval, marginal cells larger.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)— } Axillary, lateral.

Fertile Flower (ARCHEGONIA)— }

Vaginula—Cylindrical, very short.

Capsule—Oval or roundish, immersed, erect in the perichæatial leaves.

Calyptra—Conico-mitriform, smooth.

Operculum—Conico-rostrate.

Peristome—Double, composed of 16 subulate teeth converging into a cone, trabeculated; inner peristome divided into 16 filiform processes.

Annulus—Large, deciduous.

Spores—Rather small, yellow.

GENERAL HABITAT—On the branches of low bushes and the trunks of trees in England, "rare in Scotland."

SPECIES ILLUSTRATED—*Cryphæa heteromalla* (Dill., Hedw.), *Daltonia heteromalla* (Hook. and Tayl.). Fruit:—Autumn Winter.

Reference to Plate—*a*, Plant, natural size; *aa*, Portion of stem and capsule, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *ab*, Same $\times 2$ -in.; *bb*, Perichæatial leaf, $\times 2$ -in.; *c*, Outer and inner teeth of peristome, $\times \frac{1}{4}$ -in.; *cc*, inner teeth of peristome, $\times \frac{1}{4}$ -in.; *d*, Mid-leaf and marginal cells, $\times \frac{1}{4}$ -in.; *e*, Archegonia, $\times \frac{1}{4}$ -in.; *f*, Capsule, $\times 2$ -in.; *g*, Operculum, $\times 1$ -in.; *h*, Calyptra, $\times 1$ -in.

This genus is represented in Britain by the species figured.

89. GENUS FONTINALIS, *Dill.*

WHOLE PLANT—Perennial, floating mosses, attaching themselves to stones in water, weakly and flexible plants, branched from six inches to twelve inches or more in length, with oval or ovate immersed capsules; dark green.

STEM—Subdivided, with spreading branches, lower part leafless.

LEAVES—Ovate-lanceolate, or ovate-acuminate, concave, nerveless; areolæ, elongated, rhomboid, uniform throughout the leaf, colour when young of a yellowish-green, olive or dark green when older. Perichæatial leaves sheathing and obtuse.

INFLORESCENCE—Dioicous.

Barren Flower (ANTHERIDIA)—Lateral, oblong with paraphyses.

Fertile Flower (ARCHEGONIA)—Lateral, small, eserted, having paraphyses.

Vaginula—Oval.

Capsule—Ovate, immersed, constricted below the mouth, colour brown, on a short pedicel.

Calyptra—Conical, crenated at the base.

Operculum—Conical, beak short.

Peristome—Double, composed of 16 outer equi-distant beautiful red twisted teeth, prominently trabeculated, and spreading, inner peristome consisting of 16 filiform processes united by horizontal cross-bars, in the whole an elegant object.

Annulus—None.

Spores—Small, green, smooth.

GENERAL HABITAT—In stagnant water and streams, typical species abundant in the South of England, mostly barren. Fruit:—June, July.

SPECIES ILLUSTRATED—*Fontinalis antipyretica* (Linn.), and *F. squamosa* (Linn.) *in part.*

Reference to Plate—*F. antipyretica*. *a*, Fertile branch, natural size; *aa*, Portion of plant, natural size; *b*, Stem leaves $\times 1$ -in.; *bb*, Perichæatial leaf, $\times 1$ -in.; *ab*, Capsule surrounded with perichæatial leaves, $\times 2$ -in.; *c*, Outer teeth of peristome, $\times \frac{1}{4}$ -in.; *cc*, Inner teeth of same, $\times \frac{1}{4}$ -in.; *d*, Cells of stem leaf, $\times \frac{1}{4}$ -in.; *e*, Capsule and Operculum, $\times 2$ -in.; *f*, Stem leaf of *F. squamosa*, $\times 1$ -in.; *g*, cells of same, $\times \frac{1}{4}$ -in.

This genus is represented in Britain by two species.

ADDENDA.

I.

On Plates xxi. and xxii. will be found dissections of the sub-genera of the Genus Hypnum (83) according to "Hobkirk's Synopsis," pp. 145-182, to which the student is referred for more information than can be given here.

83. GENUS HYPNUM, *Dill.*

For descriptions of the following sub-genera of this Genus, see "Hobkirk's Synopsis," pp. 145-182.

SUB-GENUS I.—Thuidium, Schpr. (Plate xxi.).

SPECIES ILLUSTRATED—Thuidium tamariscinum (Hedw.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; Marginal and central cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by five species.

SUB-GENUS II.—Ptychodium, Schl. (Plate xxii.).

SPECIES ILLUSTRATED—Ptychodium plicatum (Schl.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by one species.

SUB-GENUS III.—Camptothecium (Schpr.).

SPECIES ILLUSTRATED—Camptothecium lutescens (Huds.).

Reference to Plate—a, Capsules, $\times 2$ -in.; Stem leaf, $\times 1$ -in.; Cell of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by two species.

SUB-GENUS IV.—Brachythecium (Schpr.).

SPECIES ILLUSTRATED—Brachythecium rutabulum (Linn.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Cells of leaf, $\times \frac{1}{4}$ -in.; c, Stem leaf, $\times 1$ -in.

This sub-genus is represented in Britain by 11 species.

SUB-GENUS V.—Scleropodium (Schpr.).

SPECIES ILLUSTRATED—Scleropodium caespitosum (Wils.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by two species.

SUB-GENUS VI.—Eurynchium (Schpr.).

SPECIES ILLUSTRATED—Eurynchium crassinervum (Tayl.).

Reference to Plate—a, Capsules, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; c, Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by 17 species.

SUB-GENUS VII.—Hyocomium (Schpr.).

SPECIES ILLUSTRATED—Hyocomium flagellare (Dicks.).

Reference to Plate—a, Capsule, $\times 2$ -in.; Stem leaf, $\times 1$ -in.; Cells of same $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by one species.

SUB-GENUS VIII.—Rhynchostegium (Schpr.).

SPECIES ILLUSTRATED—Rhynchostegium confertum (Dicks.).

Reference to Plate—a, Capsule, $\times 1$ -in.; Stem leaf, $\times 1$ -in.; Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by eight species.

SUB-GENUS IX.—Thamnium (Schpr.).

SPECIES ILLUSTRATED—Thamnium alopecurum (Linn.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; Marginal cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by one species.

SUB-GENUS X.—Plagiothecium (Schpr.).

SPECIES ILLUSTRATED—Plagiothecium sylvaticum (Dill. Linn.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 2$ -in.; c, Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by eight species.

SUB-GENUS XI.—Amblystegium (Schpr.).

SPECIES ILLUSTRATED—Amblystegium serpens (Linn.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaves, $\times 1$ -in.; c, Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by eight species.

SUB-GENUS XII.—Eu Hypnum (Dill.).

SPECIES ILLUSTRATED—Hypnum purum (Linn.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; c, Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by 47 species.

SUB-GENUS XIII.—Hylacomium (Schpr.).

SPECIES ILLUSTRATED—Hylacomium loreum (Linn.).

Reference to Plate—a, Capsule, $\times 2$ -in.; b, Stem leaf, $\times 1$ -in.; c, Cells of same, $\times \frac{1}{4}$ -in.

This sub-genus is represented in Britain by seven species.

II.

The following Genus *Campylostelium* (8) was omitted because I had no specimen in my possession, and could not obtain one at the time. I have, however, now received a Sussex specimen through the kindness of Mr. Mitten, and I gladly add it to the series of drawings.

8. GENUS CAMPYLOSTELIUM, Br. & Sch.

WHOLE PLANT—Bi-triennial, small, slender, gregarious plants, growing in tufts on sandstone and granite rocks, closely allied to *Selegeria* in general appearance.

STEM—Scarcely any, simple, very short.

LEAVES—Crowded, linear-subulate, narrow, entire, nerve strong, reaching nearly to, or quite to the apex; areolæ small, dot-like, basal cells larger and colourless.

INFLORESCENCE—Monoicous.

Barren Flower (ANTHERIDIA)—Gemmiform.

Fertile Flower (ARCHEGONIA)—

Vaginula—Cylindrical.

Capsule—Erect, ovate-oblong, or somewhat pyriform, glossy, pale red, on a geniculated fruit stalk.

Calyptra—Mitriform, cleft at the base.

Operculum—Conical at the base, with a long beak.

Peristome—Single, composed of 16 lanceolate, trabeculated red teeth, entire at the base, upper portion divided.

Annulus—Double.

Spores—Very small, pale yellow.

GENERAL HABITAT—Growing on loose sandstone rocks in Sussex, Cheshire, and Yorkshire. Fruit :—“November.”

SPECIES ILLUSTRATED—*Campylostelium saxicola* (Br. and Sch.), *Grimmia saxicola*. (Hook. and Tayl.)

Reference to Plate—*a*, Plant, natural size; *aa*, The same, $\times 2$ -in.; *b*, Stem leaf, $\times 1$ -in.; *c*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *d*, Mid-leaf cells, $\times \frac{1}{4}$ -in.; *e*, Basal cells, $\times \frac{1}{4}$ -in.; *f*, Capsule with Operculum, $\times 1$ -in.; *ff*, Capsule with Peristome, $\times 1$ -in.; *g*, Operculum, $\times 1$ -in.; *h*, Spores, $\times \frac{1}{4}$ -in.; *i*, Apex of stem leaf, $\times \frac{1}{4}$ -in.; *k*, Vaginula, $\times 1$ -in.

This genus is represented in Britain by the species figured.

III.

The fruit of the two following genera being very rarely met with, the drawings given before were made from a plant which I was not allowed to dissect.

Mr. Mitten, of Hurstpierpoint, has, however, recently, kindly given me specimens of fruit for my own use—*Dicranodontium* gathered on the Pyrenees, *Cylindrothecium* (*Entodon rubicundus*, Muller), on N.W. Himalaya; and Dr. Braithwaite has presented me with *Entodon cladorhizans*, gathered at Meran, in the Tyrol, by Dr. Milde. I therefore add dissections of these.

DICRANODONTIUM.

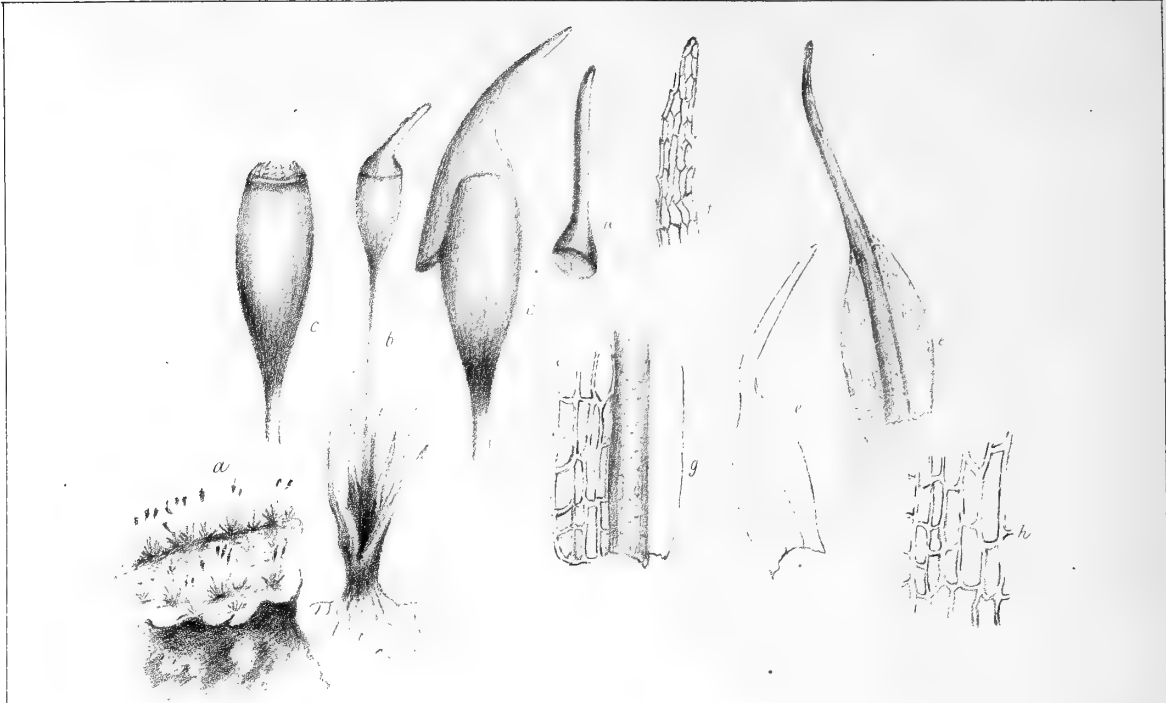
Reference to Plate—*D. longirostre*. *a*, Capsule with Operculum, $\times 2$ -in.; *aa*, Capsule with Peristome, $\times 1$ -in.; *b*, Operculum, $\times 1$ -in.; *c*, Teeth of peristome, $\times \frac{1}{4}$ -in.; *e*, Spores, $\times \frac{1}{4}$ -in.; *f*, Perichaetial leaf, $\times 2$ -in.; *g*, Vaginula, $\times 1$ -in.

CYLINDROTHECIUM, Bry. Eur.

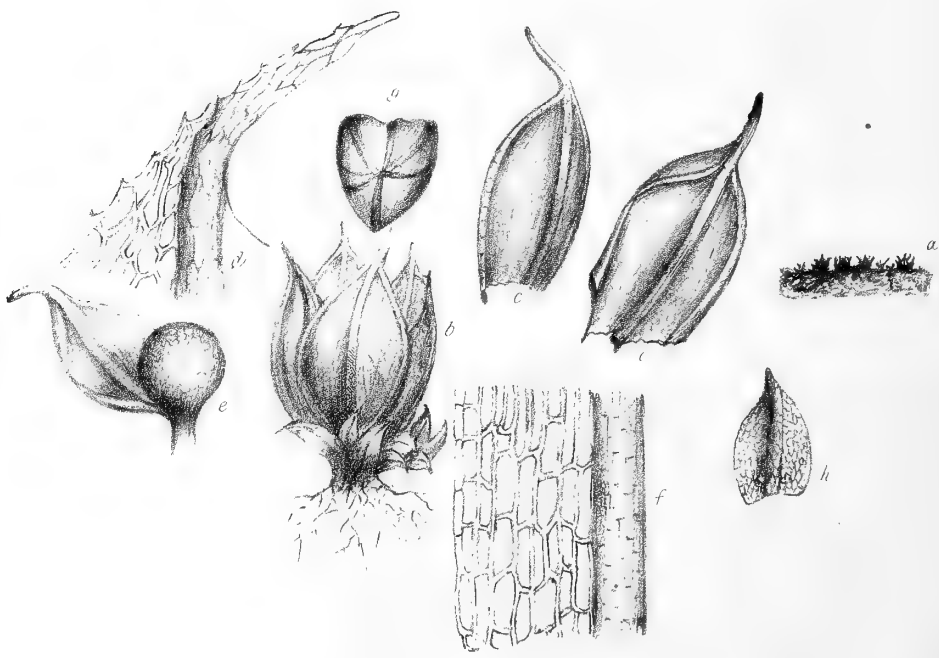
(*ENTODON, C. Muller.*)

Reference to Plate—*E. rubicundus*. *a*, Capsule with Peristome, $\times 2$ -in.; *b*, Capsule with Operculum, $\times 2$ -in.; *c*, Operculum, $\times 1$ -in.; *d*, Stem leaf, $\times 2$ -in.; *e*, Branch leaf, $\times 1$ -in.; *f*, Teeth of Peristome, $\times \frac{1}{4}$ -in.; *g*, Spores, $\times \frac{1}{4}$ -in. *E. cladorhizans*. *aa*, Capsule, $\times 2$ -in.; *bb*, Stem leaf, $\times 1$ -in.; *cc*, Operculum, $\times 1$ -in.

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Seligeria calcicola.



Acaulon triquetrum.

DESCRIPTION OF PLATES.

SELIGERIA CALCICOLA (*Mitten*).

S. PAUCIFOLIA (*Carruthers*).

S. SUBCERNUA (*Schp.*).

“Gregarious, leaves erecto-patent, subulate from an oblong base, margins plane, nerve strong and exserted, areolæ rectangular, capsule upright, on a long seta, lid with a long beak.”

Not uncommon on chalk nodules, protuding from the turf on the sides of disused roads and turf banks, on the northern slopes of the Downs round Lewes. Frequently observed on isolated pieces of chalk in and around Stanmer Park, also on Wolstonbury Hill. “As a British plant it is only found in Sussex.” Not noticed in Wilson’s “Bryologia.”

Reference to Fig. :—*a.* natural size of plant; *b.* the plant, $\times 2$ in.; *c.* capsule, $\times 1$ in.; *cc* capsule and lid, $\times \frac{1}{4}$ in.; *e.* leaves, $\times 1$ in.; *f.* apex of leaf, $\times \frac{1}{4}$ in.; *g.* basal cells of leaf, $\times \frac{1}{4}$ in.; *h.* cells of mid leaf, $\times \frac{1}{4}$ in.

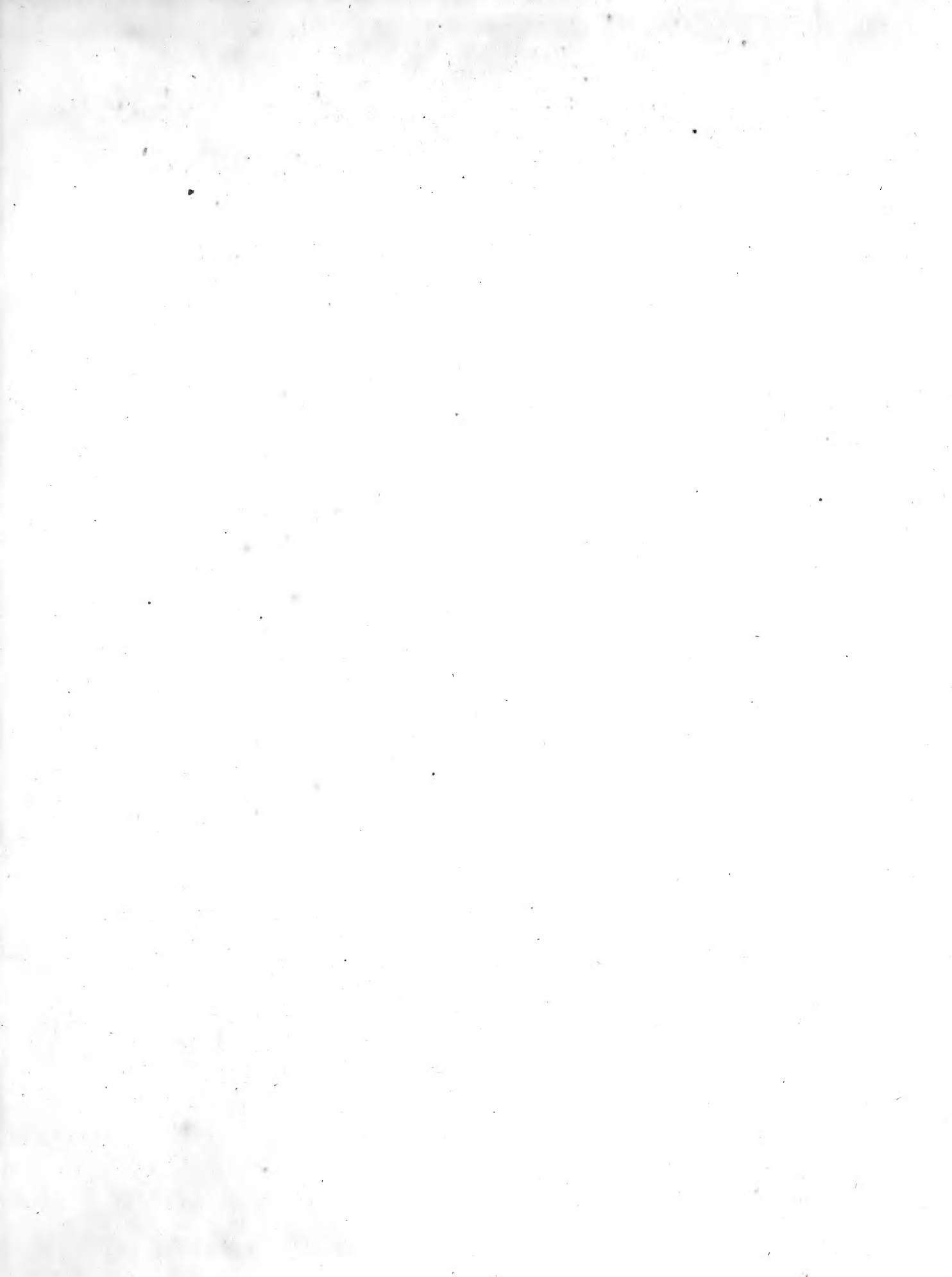
ACAULON TRIQUETRUM (*Spruce*).

PHASCUM TRIQUETRUM.

Stems, scarcely any; leaves cuculate, obovate, sharply keeled, cells large; root leaves minute; margins reflexed; nerve excurrent; apex recurved; capsule spherical, on a curved pedicel immersed.

On the Cliffs between Brighton and Rottingdean and between Rottingdean and Newhaven, frequently associated with *Pottia cavifolia*. A minute periodical plant, occurring only in some years. First discovered by the late Mr. W. Borrer, 1844. Since found occasionally by other Sussex Bryologists, and by “Mr. Mitten, in various parts of the Sussex Coast.”

Reference to Fig. :—*a.* natural size of plant; *b.* the plant, $\times 1$ in.; *c.* stem leaves, $\times 1$ in.; *d.* apex of leaf, $\times \frac{1}{4}$ in.; *e.* capsule, $\times 1$ in.; *f.* basal cells, $\times \frac{1}{4}$ in.; *g.* young plant, enlarged (from Wilson); *h.* root leaf, $\times 1$ in.



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