

This species resembles *T. elongata*, but differs in colour, in the head being smaller and the eyes less prominent, in the thorax being more cylindrical, less cordiform, and with the central depression less marked; the elytra are narrower, less deeply and less numerous punctured, and the surface more smooth and polished.

Myrmecoptera læta.

Elytra with a single white mark on each, beginning just below the shoulder, extending along the middle of the elytron to the centre, where it gets narrower and inclines to the outer margin, which it accompanies but does not quite include; again becoming broader it terminates at the angle of the suture; puncta very numerous and metallic. Also a row of larger impressions likewise metallic near to, and parallel with, the suture. Trochanters, femora, &c., black. Length 6 lines.

Hab. Abyssinia.

This species resembles *M. egregia*, Germar, but is much larger, the head is smaller, and the thorax is longer, narrower, and more cylindrical.

Carabus Boysii.

Dull black. Head rather large and finely punctured; mandibles large; last joints of palpi strongly securiform. Thorax cordiform and finely punctate, with a well-defined central furrow; anterior margin slightly concave and raised into a border; posterior margin also slightly concave, sides sinuous with elevated borders, posterior angles considerably prolonged backwards. Elytra elongate, oval, narrower before than behind, strongly striated, each stria finely punctated and each interval punctated, but more coarsely; each elytron with three rows of deep and regular indentations. Length 14 lines; breadth $4\frac{1}{2}$ lines.

Hab. India.

This species comes near to the *Carabus sylvestris*.

VII.—*Some Remarks on Mosses, with a proposed new Arrangement of the Genera.* By WILLIAM MITTEN, A.L.S.

THE author has been induced to offer to the consideration of bryologists the arrangement proposed below, from an impression that it may engage the attention of others more competent than himself to grapple with the difficulties which continually arise in endeavouring to strike out new arrangements, and whose more extensive knowledge of the vegetable kingdom may enable them at a glance to come to a proper appreciation of the conclusions he has arrived at.

It was in 1847, whilst examining *Phascum multicapsulare* of

Smith, that the author's attention was first arrested by the fact that all the Cleistocarpous Mosses might be distributed among the Stegocarpous genera; since which the subject has been neglected; and he now publishes his ideas from seeing in the most recent works on bryology the continued adhesion to the old plan of keeping up a class of Cleistocarpous genera and species.

In all arrangements of plants, Mosses, *Musci*, and Liverworts, *Hepaticæ*, are placed after Equiseta, Lycopodia, and Ferns, as though these tribes were possessed of a higher degree of development; and even in the last systematic work on Mosses, by M. C. Müller, the definition of the order commences with "*Plantæ Agamæ*," a term altogether inapplicable to *Musci* and *Hepaticæ*, however well it may agree with the tribes above mentioned, which, so far as seems known, are truly agamous.

The *Musci* may be defined as follows:—

Plants with stems bearing horizontal leaves which are mostly composed of one layer of cells and furnished with thickened nerves. Inflorescence surrounded by proper involucreal leaves. Male flowers composed of anthers, *antheridia*: female of pistils, *archegonia*, which, as well as the antheridia, are mixed with slender threads, *paraphyses*. Fruit an unilocular capsule bursting at the sides or operculate, surmounted by a calyptra.

From this definition it is apparent that the *Musci* are neither agamous nor cryptogamous, but are the highest order of Acotyledons, forming the next link to Monocotyledons, and, with *Hepaticæ*, are entitled to take precedence of the Filices, Lycopodia and Equiseta, in which inflorescence is unknown. On one side the *Musci*, with their horizontal nerved leaves and the presence of stomata in their capsules, approach to Monocotyledons; on the other side the *Hepaticæ*, which, with their nerveless semi-vertical or vertical leaves, and the form of their perianths, especially in *Jungermannia*, *Plagiochila* and *Radula*, resembling very closely the involucre of *Hymenophyllum* and *Trichomanes*, come near to the Filices.

The inflorescence of Mosses is dioicous, monoicous, or hermaphrodite. In the growth of the species that are usually termed acrocarpous, the first flower produced appears to be always male; and it is upon an innovation from beneath, or rarely through this, that the female flower and fruit are borne. In some species the antheridia are found in the axils of the comal without proper involucreal leaves; not springing out as a secondary growth, but appearing to be left there by the elongation of the axis, which has passed as it were through the first and male flower to form the female, as seen in *Bryum nutans*. In *Polytrichum undulatum* after the production of a male flower the

growth is resumed by the axis through the centre of the flower, and a female flower produced at a considerable distance. It is only such mosses as these that are strictly acrocarpous. In *Funaria hygrometrica*, which in its mode of growth represents most of the so-called acrocarpous mosses, the plant first forms a male flower, then bears female flowers on innovations arising below it: but if the female flower had been produced at the point whence the innovation proceeded, without the innovation, it must have been considered pleurocarpous, as in *Zygodon compactus* (*Hedwigia æstiva*, Eng. Fl.); although it would in that case be as much acrocarpous as it actually is. In *Fissidens* the flowers are all terminal, or only the female terminal, or both sexes lateral; both of which last cases occur at times in *F. bryoides*. In the Hypnoid Mosses the mode of growth appears more complicated; the principal axis being in many respects like a rhizoma growing at one end and decaying at the other, producing roots at the side and not having the lower end of the axis divided into roots.

The capsules of Mosses are either without a regular opening and bursting at the sides, *astomate*; or furnished with a persistent or deciduous lid, *operculum*, which on its removal leaves the capsules closed by a membrane, *stomate*: the mouth of the capsule naked, *gymnostomate*; or with highly hygroscopic teeth arising from its inner walls, *peristomate*; or with the sporular sac also divided above into processes and cilia, *diploperistomate*.

In some well-marked genera, as *Encalypta*, *Orthotrichum* and *Zygodon*, there exist gymnostomate, peristomate and diploperistomate species, too closely allied in all other respects to be separated generically in any natural arrangement. In *Weissia*, including as of one genus, *Astomum Mittenii*, *Phascum crispum*, *P. rostellatum*, and all the *Hymenostoma*, *Gymnostoma*, and *Weissia* of 'Bryologia Europæa,' are seen species astomate, stomate, gymnostomate, and peristomate; and most of these mosses without the presence of fruit would be difficult enough to distinguish as species, to say nothing of genera;—from which the conclusion seems evident, that as a more or less perfect series of progressive development from astomate to diploperistomate capsules may occur in a single genus, so any degree of development less perfect than the diploperistomate may be considered but an imperfect state of that degree, and of no importance in generic distinctions whenever it is possible to trace a higher.

The calyptra consists of the enlarged upper part of the archegonium, and is dimidiate, mitriform, or calymperoid, the last form being as it were a large mitriform calyptra split on one side; but it well marks the few genera in which it is found.

In the following arrangement, the plan of dividing the genera into groups dependent on the form of the cells of the leaves, as

employed by M. C. Müller in his Synopsis, has been used, with however some considerable modifications, and, unless otherwise stated, the genera correspond with those adopted in that valuable work.

Tribe I. ANDREÆACEÆ.

Cells of the leaves parenchymatous, but very minute and remote. Capsule astomate, bursting regularly at the sides near the apex. Sporular sac adhering throughout to the external wall of the capsule. Calyptra mitriform. Small mosses, mostly of a deep brown or blackish colour: growing on rocks.

Genus 1. *Andreæa*, *Ehrh.*

Tribe II. DICRANACEÆ.

Cells of the leaves partly prosenchymatous and partly parenchymatous, lax or more or less incrassated. Capsules mostly inclining to a cylindrical form, and sometimes arcuate, astomate, gymnostomate and peristomate. Teeth sixteen, each more or less forked or divided down the middle. Calyptra mitriform or dimidiate. Small or very large mosses, having mostly narrow leaves, which are attenuated from a complicate or clasping base, and with broad flattened nerves: growing on the earth, on rocks, or on trees.

Sect. 1. *Leptotrichoideæ*.

Leaves without enlarged cells at the base.

Genus 1. *Archidium*, *Brid.*

2. *Bruchia*, *Schw.*, including *Phascum exiguum*, *Hook. et Wils.*, *Eccremidium*, *eorund.*, and *Garckea phascoides*, *C. Müller* (*Dicranum*, *Hook.*).

3. *Angstroemia*, *B. et S.*, *C. Müller*, including *Astomum*, *Hampe.*

4. *Trematodon*, *Rich.*

5. *Brachyodus*, *Furnr.*

6. *Campylostelium*, *B. et S.*

7. *Seligeria*, *B. et S.*

8. *Symblepharis*, *Mont.*

9. *Leptotrichum*, *Hampe*, including *Lophiodon*, *Hook. et Wils.*

10. *Distichium*, *B. et S.*

11. *Eustichia*, *Brid.*

12. *Drepanophyllum*, *Rich.*

Sect. 2. *Dicranoideæ*.

Leaves with enlarged and mostly coloured cells at the base.

13. *Blindia*, *B. et S.*

14. *Eucamptodon*, *Mont.*

15. *Holomitrium*, *Brid.*

16. *Dicnemon*, Schw.
17. *Pilopogon*, Brid.
18. *Dicranum*, Hedw.

Tribe III. POTTIACEÆ.

Cells of the leaves all parenchymatous, often minute, incrassated and papillose. Capsules astomate, stomate, gymnostomate, peristomate, and diploperistomate. Teeth sixteen or thirty-two, often cohering together: internal peristome of cilia. Calyptra mitriform, dimidiate, or calymperoid. Small or rather large mosses with chlorophyllose lanceolate or strap-shaped leaves, having terete nerves and smooth or striate capsules: growing on the earth, on rocks, and on trees.

Sect. 1. *Trichostomoideæ*.

Peristome of narrow slender teeth.

Genus 1. *Schistidium*, Brid., including *Acaulon*, C. Müller.

2. ? *Gonomitrium*, Hook. et Wils.

3. *Pottia*, Ehrh., C. Müller, including *Phascum bryoides*, P. rectum, P. curviculum, P. cuspidatum, P. subexsertum, P. splachnoides, P. tetragonum, P. cylindricum, and P. Drummondii; but scarcely distinguishable from the next genus.

4. *Trichostomum*, Hedw.

5. *Barbula*, Hedw.

6. *Streptopogon*, Wils.

7. *Ceratodon*, Brid.

8. *Weissia*, Hedw., C. Müller, including *Astomum crispum*, A. Mittenii, A. multicapsulare, and A. rostellatum of Bryol. Europ.

9. *Syrrhopodon*, Schw.

10. *Calymperes*, Sw.

11. *Tridontium*, Hook. fil.

Sect. 2. *Zygodontoideæ*.

Peristome of broad teeth.

12. *Coscinodon*, Spreng.

13. *Glyphomitrium*, Brid.

14. *Brachystelium*, Rchb.

15. *Gumbelia*, Hampe.

16. *Grimmia*, Ehrh.

17. *Cryptocarpus*, Dzy. et Molk.

18. *Drummondia*, Hook.

19. *Zygodon*, Hook. et Tayl.

20. *Orthotrichum*, Hedw.

21. *Macromitrium*, Brid.

22. *Schlotheimia*, Brid.

23. *Encalypta*, Schreb.

Tribe IV. FUNARIACEÆ.

Cells of the leaves parenchymatous, lax. Capsules more or less pyriform, apophysate, astomate, stomate, gymnostomate, peristomate, and diploperistomate. Teeth sixteen or thirty-two, sometimes cohering together: internal peristome of processes and cilia. Calyptra mitriform, dimidiate, or calymperoid. Mosses of great beauty, with chlorophyllose or pale pellucid leaves, and with capsules having sometimes remarkably large and coloured apophyses: growing on the earth or on decaying animal or vegetable matter.

Sect. 1. *Funaroideæ*.

Capsules not remarkably apophysate. Peristome of trabeculate teeth.

Genus 1. *Ephemerum*, *Hampe*.

2. *Ephemerella*, *C. Müller*.

3. *Physcomitrium*, *Brid.*, including *Phascum patens*, *Hedw.*, and *Schistidium serratum*, *Hook. et Wils.*

4. *Pyramidium*, *Brid.*

5. *Entosthodon*, *Schw.*

6. *Discelium*, *Brid.*

7. *Funaria*, *Schreb.*

8. *Amblyodon*, *Pal. de Beauv.*

Sect. 2. *Splachnoideæ*.

Capsules sometimes remarkably apophysate. Peristome of mostly geminate teeth, which are not trabeculate.

9. *Ædipodium*, *Schw.*

10. *Tetraplodon*, *B. et S.*

11. *Tayloria*, *Hook.*, including *Voitia*, *Hsch.*

12. *Dissodon*, *Grev. et Arnott.*

13. *Splachnum*, *Linn.*

Tribe V. BRYACEÆ.

Cells of the leaves in the upper parts prosenchymatous, in the lower parallelogram. Capsules pyriform, clavate or cylindrical, stomate, gymnostomate, peristomate, and diploperistomate. Teeth sixteen: internal peristome of processes and cilia. Calyptra dimidiate. Small or rather large and graceful mosses, mostly with pendulous capsules: growing on the earth, on rocks, and on trees.

Genus 1. *Schistostega*, *Mohr.*

2. *Meilichhoferia*, *Hsch.*

3. *Leptochlæna*, *Mont.*

4. *Orthodontium*, *Schw.*

5. *Bryum*, *Dill.*

Tribe VI. BARTRAMIACEÆ.

Cells of the leaves parenchymatous. Capsules pyriform or globose, gymnostomate, peristomate, and diploperistomate. Peristome as in *Bryum*, but the processes splitting down the middle. Calyptra dimidiate. Small or very large mosses, mostly with rigid papillose leaves, and pyriform or globose capsules : growing on the earth or on rocks.

Genus 1. *Oreas*, *Brid.*

2. *Catoscopium*, *Brid.*

3. *Plagiopus*, *Brid.*

4. *Meesia*, *Hedw.*

5. *Paludella*, *Ehrh.*

6. *Conostomum*, *Sw.*

7. *Bartramia*, *Hedw.*

Tribe VII. MNIACEÆ.

Cells of the leaves parenchymatous, with cartilaginous walls. Capsules oval or cylindrical, gymnostomate, peristomate, and diploperistomate. Teeth four or sixteen : internal peristome of processes and cilia. Calyptra mitriform or dimidiate. Small or very large and beautiful mosses : growing on the earth, on rocks, or on trees.

Genus 1. *Hymenodon*, *Hook. et Wils.*

2. *Fissidens*, *Hedw.*

3. *Octodiceras*, *Brid.*

4. *Mniadelphus*, *C. Müller.*

5. *Daltonia*, *Hook. et Tayl.*

6. *Cinclidotus*, *Pal. de Beauv.*

7. *Scouleria*, *Hook.*

8. *Georgia*, *Ehrh.*

9. *Leptostomum*, *R. Brown.*

10. *Leptotheca*, *Schw.*

11. *Timmia*, *Hedw.*

12. *Mnium*, *Dill.*, including *Cinclidium*, *Sw.*

Tribe VIII. HYPOPTERYGIACEÆ.

Cells of the leaves prosenchymatous. Leaves dimorphous. Capsules gymnostomate? and diploperistomate. Teeth sixteen : internal peristome of processes and cilia. Calyptra mitriform and dimidiate. Very beautiful mosses, with simple or pinnate stems and tristichous leaves, one row of which are smaller and resemble stipules : growing on the earth or on trees.

Genus 1. *Hypopterygium*, *Brid.*

2. *Cyathophorum*, *Pal. de Beauv.*

3. ? *Helicophyllum*, *Brid.*

Tribe IX. HYPNACEÆ.

Cells of the leaves prosenchymatous, but mostly a few quadrate coloured ones at the base of the leaf. Capsules gymnostomate, peristomate, and diploperistomate. Teeth sixteen: internal peristome of processes and cilia. Calyptra mitriform, dimidiate, or calymperoid. Small or large mosses with simple or much branched stems, and nerveless or one or more nerved leaves: growing on the earth, on rocks, or on trees.

Genus 1. *Rhegmatodon*, *Brid.*

2. *Fabronia*, *Raddi.*

3. *Neckera*, *Hedw.*

4. *Aulacopilum*, *Wils.*

5. ? *Wardia*, *Harvey.*

6. *Phyllogonium*, *Brid.*

7. *Pilotrichum*, *Pal. de Beauv.*

8. *Hookeria*, *Smith.*

9. *Hypnum*, *Dill.*

Tribe X. POLYTRICHACEÆ.

Cells of the leaves parenchymatous, firm. Capsules stomate and peristomate. Peristome of numerous inarticulate cilia, free or combined together, and forming short tooth-like processes which are more or less adherent to the tympaniform expansion of the columella at the mouth of the capsule. Calyptra dimidiate. Small or very large mosses, mostly with rigid acute leaves, large, more or less angular, asymmetric capsules, and calyptras mostly covered with hair: growing on the earth.

Genus 1. *Lyellia*, *R. Brown.*

2. *Polytrichum*, *Dill.*

3. *Dawsonia*, *R. Brown.*

Tribe XI. BUXBAUMIACEÆ.

Cells of the leaves partly parenchymatous and partly prosenchymatous. Capsules asymmetric, peristomate and diploperistomate. Teeth beaded, free, or coherent together: internal peristome of a plicate membrane. Small but remarkable mosses, with very large asymmetric capsules: growing on the earth, on rocks, or on trees.

Genus 1. *Diphyscium*, *Web. et Mohr.*

2. *Buxbaumia*, *Haller.*

Tribe XII. LEUCOBRYACEÆ.

Cells of the leaves in one or more layers, dimorphous, external partly parenchymatous and partly prosenchymatous, foraminose on the internal walls, colourless; internal cells placed between

the external layers, minute, chlorophyllose and duct-like. Capsules cylindrical, gymnostomate? and peristomate. Teeth eight or sixteen. Calyptra mitriform or dimidiate. Mosses remarkable for the pale colour, iridescence, and structure of the cells of their leaves: growing on the earth, on rocks, or on trees.

Genus 1. *Octoblepharum*, *Hedw.*

2. *Arthrocnemum*, *Dzy. et Molk.*

3. *Leucophanes*, *Brid.*

4. *Schistomitrium*, *Dzy. et Molk.*

5. *Leucobryum*, *Hampe.*

Tribe XIII. SPHAGNACEÆ.

Cells of the leaves dimorphous, prosenchymatous, the larger colourless, perforate, often containing annular fibres; the smaller chlorophyllose, placed between the larger. Capsules gymnostomate. Calyptra covering the whole capsule. Large mosses, with erect stems, pale or rose-coloured leaves, and globose sessile capsules: growing in bogs.

Genus 1. *Sphagnum*, *Dill.*

PROCEEDINGS OF LEARNED SOCIETIES.

ROYAL INSTITUTION.

Friday, February 7, 1851.

On Metamorphosis and Metagenesis. By Professor OWEN.

THE Lecturer commenced by passing under review the Linnæan characters of Minerals, Vegetables, and Animals, and the subsequent distinctions which had been proposed for the discrimination of the two latter kingdoms of nature. After discussing those founded on motion, the stomach, the respiratory products, the composition of the tissues, and the sources of nourishment, it was shown that none of these singly define absolutely the boundaries between plants and animals; it requires that a certain proportion of the supposed characteristics should be combined for that purpose.

The individuals in which such characters are combined are specially defined members of one great family of organized beings, and the supposed peculiarly animal and vegetable characters taken singly, interdigitate, as it were, and cross that debatable ground and low department of the common organic world from which the specialized plants and animals rise; and there are numerous living beings with the common organic characters that have not the distinctive combined superadditions of either group.

Between the organic and inorganic worlds the line of demarcation may be more definitely drawn. The term 'growth' cannot be used in the same sense to signify the increase of a mineral and of an organism. The mode of increase is different: there is a definite limit to it in the organic kingdom, and something more than mere growth



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