Taylor & Francis
Taylor & Francis Group

Annals and Magazine of Natural History
Series 1

ISSN: 0374-5481 (Print) (Online) Journal homepage: http://www.tandfonline.com/loi/tnah07

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To cite this article: Richard Spruce Esq., F.B.S. (1844) XXVI.—The Musci and Hepaticæ of Teesdale , Annals and Magazine of Natural History, 13:83, 191-203, DOI: 10.1080/03745484409442593

To link to this article: http://dx.doi.org/10.1080/03745484409442593

of *Œ. Phellandrium*, both in form and proportion, have added a satisfactory character to those previously observed.

P.S. I should add that *Œ. fluviatilis*, removed to such a pond as *Œ. Phellandrium* grows in, has preserved the character of its submersed leaves for twelve months, but has not flowered.

Christ's Hospital, Hertford, Dec. 7, 1843.

EXPLANATION OF PLATE III.

Fig. 1..Submersed leaf of *Œnanthe fluviatilis.*
— 2. Upper stem, leaf and umbel of do.
— 3. Ripe fruit.
— 4. Section of unripe fruit.
— 5. Ripe fruit of *Œ. Phellandrium.*
— 6. Section of unripe fruit of do.

Note.—Mr. Borrer has observed *Œ. fluviatilis* in several parts of England, and when a young botanist, and unacquainted with *Cicuta virosa*, he mistook it in the young state for that plant, and it is published on his authority as such as growing at Canterbury and Ashford, in Turner and Dillwyn's 'Botanist's Guide.' I have seen what I believe to be the same plant, but without flowers, in a brook at Cherry Hinton and in the river Cam at Granchester, Cambridgeshire.—C. C. B.

XXVI.—*The* Musci *and* Hepaticæ *of Teesdale.* By Richard Spruce, Esq., F.B.S.*

There is not perhaps in the British Islands a lover of wild plants who has not heard of Teesdale, and who does not preserve in his herbarium, as objects of especial interest, *some*, at least, of its many rarities; and there are not many, with the means in their power, who have denied themselves the exquisite pleasure of seeing these "gems of Flora" in their native wilds, and of gathering them with their own hands. Yet half a century ago no botanist had set foot in Teesdale, and it is little more than thirty years since "old Binks, the miner," discovered *Gentiana verna*, "doomed" till then "to blush unseen," though existing in the greatest profusion. To this beautiful plant he and his friend the late Mr. Oliver of Middleton shortly afterwards added the no less rare *Saxifraga Hirculus*; and within the space of a few years they had become acquainted with nearly every flowering-plant and fern known to grow in Teesdale at the present day. A district so fertile in uncommon Phanerogamous plants might reasonably be expected to produce an equal abundance of Cryptogamia, and a reference to the second volume of Hooker's 'British Flora' will show that it has been very successfully explored for lichens,

* Read before the Botanical Society at Edinburgh, 11th Jan. 1841.

especially by Mr. Robertson and the late Rev. J. Harriman; but if we consult the descriptions of *Musci* and *Hepaticæ* in the same volume, we shall find only a single species (the *Gymnostomum Donianum* of Smith) recorded to grow in Teesdale! Even Baines's 'Yorkshire Flora' contains only four Teesdale mosses, of which the one above mentioned is the only rare species. In order to decide whether this lack of bryological intelligence relative to a tract of country of such promising aspect arose from its real poverty in objects of that class, or, as was more probable, from its having never been properly explored, I have devoted nearly three weeks during the past summer to a careful examination of what is called Upper Teesdale, viz. that portion of the vale of the Tees which lies *above* Middleton in Teesdale; at the same time exploring, but less minutely, the district between Middleton and Barnard Castle, extending in a contrary direction. As I anticipated, Teesdale has proved not less rich in mosses than in flowering-plants and ferns; for besides ascertaining it to produce many of the rarest mosses previously known as British, I have had the pleasure of discovering *six* species quite new to our islands; these are *Bartramia calcarea* (Bruch and Schpr.), *Bryum acuminatum* (Bruch and Schpr.), *Br. obconicum* (Hornsch.), *Br. pallescens* (Schwægr.), *Orthotrichum stramineum* (Hornsch.), and *Hypnum confervoides* (Brid.). Other mosses will be found in the following list, not previously described in any work on British bryology, but in the discovery of which I have been anticipated by other botanists. Amongst the *Hepaticæ*, though few species fructify in the summer months, and the search is consequently prosecuted with diminished interest, I have met with considerable success. A *Jungermannia*, originally discovered near Bantry by Miss Hutchins, and called at first by Hooker *J. Bantriensis*, but afterwards referred by him to *J. bidentata* as a variety, I have, by finding it with male and female fructification, demonstrated to be a very distinct species.

What is above stated will suffice to show that few districts rival Teesdale in their bryological productions; in fact it wants only *wood*, in which it is remarkably deficient, to render it equal to any in the British isles *. Cromaglown, near Killarney, is the only locality I have seen superior to it: in that *Paradise of mosses* every rock is moss-clad, mosses drink the spray of every little waterfall, and the trunk of almost every tree is so thickly begirt with mosses as to appear of double its real diameter! Teesdale can show nothing like this; but the rocky banks of its wild river

* The few trees which exist in Upper Teesdale produce some mosses of such real excellence, that one may well be allowed to regret the destruction of the forests which tradition reports to have once extended over the whole of that region.

nourish many a moss unknown to Cromaglown, and yielding to none in beauty and rarity.

Amongst the mosses which most conspicuously ornament the rocks in Teesdale may be mentioned the various species of the genus *Bartramia*, all of which, with the exception of *B. arcuata*, were covered with their elegant pomiform capsules at the time of my visit. By far the most striking of these is the new *B. calcarea*, and it is besides of such frequent occurrence that the most casual observer could not fail to notice it. The *Brya*, too, were in the greatest variety and perfection, and in this genus alone I gathered not fewer than a hundred forms. Among all the tribes of mosses there is none more difficult than the *Bryaceæ*, and perhaps none has been more imperfectly studied by English botanists; at least, a perusal of the 'Bryologia Europæa' of Bruch and Schimper has shown me how little *I* was previously satisfied to know concerning it; and it is to be hoped that the publication of this unrivalled work will give a new impulse to the progress of bryology in this country,—*a country* which, as Bruch and Schimper themselves confess, possesses "la plus belle végétation cryptogamique" of any in Europe.

As I had not studied the *Brya* very extensively before the present year, I had failed to remark any peculiar beauty in the generality of the species, and I read with a smile that portion of the introduction to the genus *Bryum* in the 'Bryol. Europ.' which relates to their habits and geographical distribution, where their charms are eulogized in the most glowing terms; but what I have seen in Teesdale compels me to admit, that in variety of colour and elegance of appearance the *Brya* yield to no other mosses. In their sixth Fasciculus the authors of the 'Bryol. Eur.' have the following remarks on the alpine *Brya*: "Mountains of moderate height give birth to only a small number of species; there we find in the clefts of rocks *Br. pallescens* and *cæspititium*, on the earth *Br. argenteum* and *atro-purpureum*; but arrived in subalpine and alpine regions, a new and rich vegetation presents itself to the bryologist. Here, where on heights beaten by the winds, in ravines filled with snow, and at the moving foot of eternal glaciers, plants of superior orders disappear or only exist in a diminutive state, many species of *Bryum* render less dreary those isolated solitudes, and charm from afar the eyes of the dejected traveller. And who does not recall with delight the fine swelling tufts of *Bryum turbinatum* var. *Schleicheri*, whose tender green borders the dissolving snows, or conceals fountains clear as crystal? or the deep-green velvet of *Br. Ludwigii*, which lines, alternately with the sombre patches of *Br. cucullatum*, the wintry ravines of the Alps? Even before attaining the alpine region we are agreeably surprised by the fine *Br. alpinum*, which begins to

be covered with its purple capsules, so rare in the low countries, where this beautiful species is only of accidental occurrence; *here,* in company with the magnificent *Br. pseudo-triquetrum,* it spreads over rocks moistened by the water which trickles from the heights. The hollow ways are decked with the elegant *Br. longicollum* (*Br. elongatum,* Dicks.), with its slender and graceful capsules," &c. &c. Though Teesdale possesses no mountains whose height can be compared to those of Switzerland and "Rheinland,"—no eternal snows and glaciers, its more northerly latitude renders it capable of producing many alpine plants at a less altitude than in the Vosges and Alps, or even in the mountains of the more southern parts of our own islands. Thus while my friend Dr. Taylor has to ascend to the summit of Brandon mountain for *Br. Zierii,* I have seen it in Teesdale growing in the greatest luxuriance at the altitude of a thousand feet, which is more than two-thirds less than the former.

For a complete geographical and geological description of Teesdale, I must refer to the second Part of Phillips's 'Geology of Yorkshire,' but the following sketch of part of the course of the Tees, extracted from page 153 of that work, may be acceptable:—

"The Tees rises on the east part of Crossfell, which is 2901 feet high, flows eastward four miles, through the Yoredale limestones to the Tyne bottom limestone, and receives on its right bank a stream called Trout beck, which flows north-eastward from a hollow in the Penine chain on the main limestones 2400 feet above the sea. The united stream flows south-east, first in Tyne bottom limestone, and afterwards in Whin sill, to the Weel, 1489 feet above the sea, then falls over the basaltic rocks of Caldron Snout, about 200 feet, and receives Maize beck. The general course of Maize beck is east-north-east. From Caldron Snout the Tees still runs east-north-east till it receives the long stream of Harewood beck, flowing south-east, which direction it takes and continues in basalt to below the miners' bridge, thence south-eastward in Yoredale limestone, grits and plates, to near Egglestone, having received on the right the Lune flowing east-by-north, thence to Egglestone abbey in plates and grits above main limestone, receiving on the right the waters of Balderdale and Deepdale, east-by-north. Two miles below it receives the Greta."

Of the other streams alluded to in the following list, Ettersgill beck runs into the Tees, on the Durham side, between the High Force and Winch Bridge; its course is almost entirely in limestone. "Hell Cleft" is the name given to a ravine (excavated in the limestone) above the village of Newbiggen; it is also traversed by a considerable stream. Blea beck comes tumbling down over basaltic rocks on the north side of Green Fell

(in Yorkshire) and joins the Tees a little above the High Force. The beautiful cascade called White Force is formed by a stream which falls over Cronkley Scarr, and joins the Tees not far from Winch Bridge; here the granular or "sugar limestone" may be seen both above and below the basalt: according to Professor Phillips, "portions of the upper members, limestone and shale, are raised up and enveloped in the Whin, which penetrates in two wedge-shaped expansions between the limestones and shale." The High Force is well known to be one of the finest waterfalls in England, and it is scarcely necessary to mention that here the whole body of the Tees is hurled over a precipice of 63 feet in height*, the lower portion of which consists of limestone and the upper of basalt.

The triangular space between the Tees, the Lune and Maize beck, constituting the north-west angle of Yorkshire, is occupied by a mountain range which stretches from west to east, and of which Mickle Fell, the westernmost and loftiest summit, is 2600 feet high. Proceeding hence in an easterly direction, we come successively upon Cronkley Fell, Green Fell and Holwick Fell, each of which is less lofty than the one preceding, until we finally descend to the eastern angle of the triangle, at the junction of the Lune and Tees, which may be 900 feet above the level of the sea. Cronkley and Holwick Fells terminate to the north in a long and lofty range of basaltic cliffs, called "Scarrs;" and Falcon Clints or Widdy-bank Scarr is a similar range (but with a southern aspect) extending from Caldron Snout about a mile down the left or Durham bank of the Tees. The mountain limestone formation expands over the whole of this triangle, except where the basalt is interposed, which it is indeed "in such masses as to predominate in the general aspect of the region, and give to Upper Teesdale the character of a basaltic formation."

I am not aware that I gathered a single moss in Teesdale on any other rock than those above mentioned, and I was from the first careful to note which of the two every species appeared to prefer; but it was with some degree of disappointment I ascertained that very few mosses were absolutely confined to either, and there are not more than half-a-dozen species in the following list which I expect would obstinately refuse to grow on one or other of them. Even the flowering-plants which we most usually find on limestone, such as *Avena alpina* and various *Orchideæ*, appear equally partial to the basalt. *Helianthemum canum*, which is confined to the "sugar limestone" on Cronkley Fell, is perhaps the only one which it would surprise me to see growing on the basalt; but as to *Bartsia alpina, Elyna caricina, Carex capil-*

* The height of the fall may be a few feet less than this.

laris, Polygonum viviparum, Saxifraga stellaris and *aizoides,* and many other of the "glories" of Teesdale, which it gave me great pleasure indeed to *see,* but which I was content to leave untouched, they assuredly grow in equal luxuriance on both formations.

But my object was not so much to ascertain the distribution as to determine the limits of the different species; and what follows is not a mere list of localities, but contains the result of extensive observation in the field, and careful investigation and comparison in the cabinet. I have adopted the generic distribution of the 'Bryologia Europæa,' so far as the published numbers of that work extend, because it is by far the most natural of any I have seen, and I have no doubt will be adopted, in great part at least, by the bryologists of this country, when its merits come to be fully known*. I have also in many cases quoted from the same work the specific characters of such mosses as have not been previously described in any work on British bryology; but the numerous analyses and descriptive remarks are entirely deduced from my own observations.

The total number of species observed in Teesdale amounts to 208, of which 167 are *Musci* and 41 *Hepaticæ*; but this can only be regarded as an approximation to the existing number; and a residence of three or four years in the centre of the district, with an attentive examination of localities at all seasons, would not more than suffice to ascertain the exact amount of its treasures. I have to add, that my collection contains a few mosses which from their imperfect state I have been unable to determine satisfactorily; these are not included in the foregoing enumeration.

Musci.

1. *Andræa alpina,* Hedw. Limestone rocks on Cronkley Fell.
2. *A. Rothii,* Mohr. Cronkley Fell, on limestone; Falcon Clints, on basalt.
3. *A. rupestris,* Hedw. Frequent on rocks and stones. I gathered a large var. on Cronkley Fell, growing with *A. alpina,* and scarcely to be distinguished from it at sight.
4. *Anictangium ciliatum,* Hedw. White Force, Falcon Clints and other places, yet nowhere abundant.
5. *Anomodon curtipendulum,* H. and T. Walls near Romaldkirk and below the High Force inn. Especially abundant in the wood by the Tees' side below Holwick, and in fruit, but out of season.
6. *A. viticulosum,* H. and T. Trees and rocks, frequent.
7. *Aulacomnion palustre,* Schwægr. (Bryum palustre, *H. and T.*) Bogs and moist rocks.

* Wherever the nomenclature differs from that of 'Musc. Brit.,' the synonyms of this work are always added.

8. *Aulacomnion androgynum*, Schwægr. (Bryum androgynum, *Hedw.*; *H. and T.*) Shaded rocks below the High Force, with gemmæ.

9. *Barbula fallax*, Hedw. (Tortula fallax, *H. and T.*) By the Tees' side.

10. *B. muralis*, Timm. Walls.

11. *B. ruralis*, Hedw. Walls, &c. between Middleton and Barnard Castle.

12. *B. subulata*, Brid. Banks and rocks, both in the high and low grounds.

13. *B. tortuosa*, W. and M. Frequent on limestone rocks. A small var. occurs on the sugar limestone near the summit of Cronkley Fell, which forms low spreading patches of a brownish hue; the leaves are shorter than in the ordinary form, their nerve less broad and strong, and the capsules are always curved.

14. *B. unguiculata*, Hedw. Common.

15. *B. vinealis*, Brid. "Cæspitosa, dioica; foliis recurvo-patentibus, ovato- et elongato-lanceolatis; capsula ovato-oblonga vel oblongo-cylindrica, erecta, *annulata*, *brevirostra*; peristomii membrana conjunctiva *longiore*, dentibus *semel* contortis."—*Bryol. Europ.*

B. vinealis, *Brid. Bryol. Univ.* i. *Suppl.* p. 830.

On a wall by the road leading from Barnard Castle to Lartington, with capsules just coming to maturity, June 23rd. It grows intermixed with *Weissia curvirostra*, and the reddish stems are so much alike in both, that a casual observer would hardly distinguish them.

B. vinealis is very closely allied to *B. fallax*, but differs from it as follows. *Leaves* longer and narrower, spreading and somewhat recurved (but not squarrose), with nearly plane margins; the inner perichætial leaves scarcely differing from the rest, but in *B. fallax* much broader in their lower half and loosely sheathing the pedicel: *capsule* annulate: *operculum* shorter: *peristome* only *once* (in *B. fallax three or four times*) twisted. Besides, as Bruch and Schimper observe, "les fruits mûrissent en été, époque à laquelle ceux de *B. fallax* sont passés depuis longtemps." At the time I now write (Nov. 9th) the capsules of *B. fallax* are just beginning to ripen.

I cannot account myself the discoverer of this moss in Britain, for Mr. Wilson has lately sent me specimens gathered by himself at Nant-y-Belan, near Wrexham, in 1833; and he suggests that even the *Zygotrichia cylindrica* described by Dr. Taylor in the 'Flora Hibernica' may be the same species.

16. *Bartramia arcuata*, Brid. Heathy and rocky situations, abundant, but I did not succeed in finding capsules.

17. *B. calcarea*, Br. and Sch. "Procera, foliis secundis vel subsecundis, confertis, longioribus, *crassicostatis*, *laxius* reticulatis; perigonialibus omnibus *acute acuminatis*, solidi-costatis; peristomii minoris dentibus *remote* articulatis."—*Bryol. Europ.*

Moist springy places, frequent, both on the limestone and basalt.

Very fine by the road-side between the High Force inn and Winch Bridge.

This magnificent species was detected a few years ago by Bruch near Deux Ponts, and it has since been observed in the Vosges, Jura, and other mountain regions of continental Europe. The authors of 'Bryol. Europ.' state that they have never found intermediate states between it and *B. fontana*, and that it constantly preserves the characters they have assigned to it. I have similar testimony to offer; for I distinguished the two, by habit alone, almost on my entering Teesdale, and during my stay I continued to observe them almost daily without detecting any feature calculated to shake my conviction of their being specifically distinct. I shall now state the differences which appear amply to justify their separation. In *B. calcarea* the *stems* are stout, densely cæspitose; *leaves* secund (usually patent in the other), of larger size, narrower, and tapering to a longer point, *all* lanceolato-acuminate (not ovato-acuminate and lanceolate on the same plant): areolation wider: nerve remarkably strong and solid, and offering a great contrast to that of *B. fontana*. These differences are most striking on the floriferous branches of the male plants. The male flowers consist of fewer leaves, *all of which are acuminate and nerved throughout*; but the inner perigonial leaves in *B. fontana* are *very obtuse*, with an abbreviated or obsolete nerve*. The peristome is smaller, the outer teeth shorter and broader, and the texture of the outer paries of the capsule is less dense near its mouth.

18. *B. fontana*, Sw. Less frequent than the last, but fruiting beautifully in Hell Cleft.

19. *B. gracilis*, Flörke. At the White Force, attaining a large size; rocks below the High Force.

20. *B. Halleriana*, Hedw. In the clefts of basaltic rocks near the High Force, with fruit in a good state.

21. *B. ithyphylla*, Brid. Frequent on basaltic rocks, especially on Cronkley and Holwick Scarrs.

22. *B. pomiformis*, Hedw. Rocky situations near the High Force, &c.; less frequent than the last. Var. *β. crispa*, intermixed with *B. Halleriana*.

23. *Bryum acuminatum*, B. and S. "Monoicum; caule simplici innovationibus ramoso, basi radicante; foliis caulinis inferioribus parvulis, remotis, ovato-lanceolatis, erectis, superioribus fastigiatis, confertis, duplo-majoribus, lineari-lanceolatis, 1—2 plicatis, margine valde revolutis, apice serratis, costa ad apicem producta; capsula longicolla, gracili, horizontali, operculo conico."—*Bryol. Eur.*

* The term 'ecostata' applied to them by Bruch and Schimper is too strong.

Pohlia acuminata, *Hoppe and Hornsch, Bot. Zeit.* 1819, p. 94; *Brid. Bryol. Univ.* i. p. 610.

Near the west end of Holwick Scarr, very scarce, and I did not succeed in finding more than a few *dead* capsules.

It has also been discovered more lately by Mr. Wilson in Wales ("Cwm Idwel, Aug. 1843"), and from a comparison of his specimens, which are in very good state, with others of *Br. elongatum*, Dicks., I am inclined to regard them distinct. In both species the inflorescence is monoicous, but in the former the *antheridia* are included in *gemmæ* seated at the base of the female flower; whereas in the latter, they stand in pairs in the axils of the perichætial leaves. Besides, in the former the *leaves* are of a deeper green, shorter and broader yet with a more slender point, less decidedly serrate, with margins more strongly recurved, a much stronger nerve and smaller areolation. In the form of the capsule, the two mosses present scarcely any difference.

Br. acuminatum appears to be of frequent occurrence on the continent, and many varieties and subvarieties are described in the 'Bryol. Europæa.'

24. *Bryum albicans*, Wahl. Near the High Force and other places, but barren.

25. *Br. alpinum*, L. Frequent on low moist rocks; I saw no fruit.

26. *Br. annotinum*, Hedw. In fruit near the High Force inn, and on the moor as you go to Cronkley Bridge, but scarce.

27. *Br. argenteum*, L. Frequent.

28. *Br. cæspititium*, L. On a wall near Barnard Castle. The only station observed in Upper Teesdale was upon a wall near the farmhouse on the hill above the High Force.

29. *Br. capillare*, L. On walls between Barnard Castle and Middleton; on rocks in Upper Teesdale.

30. *Br. carneum*, L. Moist sandy situations.

31. *Br. cernuum*, B. and S. "Caule ramoso, radicante; foliis patulis ovato-acuminatis, concavis, costa excurrente mucronatis; capsula in pedicello elongato magis minusve curvato nutante vel pendula, pyriformi, operculo parvulo, convexo, acuminato, annulo magno; peristomio interno externo adglutinato."—*Bryol. Europ.*

On walls by the road-side all the way from Barnard Castle to the High Force inn, especially abundant about Romaldkirk and Mickleton; it is also frequent on the rocky banks of the Tees, growing along with *Br. inclinatum*.

Hedwig, having failed to observe the inner peristome (in consequence of its being closely soldered to the outer), included this moss in his genus *Cynodontium*, to which he assigned the following character: "Peristomium simplex octo aut sedecim parium. Sporangium absque apophysi. Flos terminalis hermaphroditus."

By Swartz it was placed in *Didymodon*! Hornschuch formed of it his genus *Ptychostomum*, and divided it into several spurious species. But I am doubtful whether it can be considered distinct from *Br. inclinatum*; the adhesion of the inner peristome to the outer is often only partial, and if this character be abstracted little is left to separate them. After having compared a great many states of both mosses, I can only find that the leaves of *Br. cernuum* are broader, yet tapering more suddenly into a slender point, and that the outer peristome is shorter. If these characters prove constant, *perhaps* they may suffice to maintain *Br. cernuum* in the rank of a species, but at present I hardly expect such will prove to be the case.

32. *Bryum crudum*, Huds. Abundant, especially in the crevices of shady rocks. This species, though in habit one of the most marked of all *Brya*, varies considerably in the direction of its capsules: sometimes, as in specimens gathered by Ettersgill beck, they are nearly or quite erect; at others perfectly pendulous, as on Cronkley Fell.

33. *Br. inclinatum*, B. and S. "Hermaphroditum; caule breviusculo, radiculoso-tomentoso, parce ramoso; foliis ovato-lanceolatis, longius acuminatis, integris; capsula nutante vel pendula, ventricoso- vel ovato-pyriformi, microstoma, annulata, operculo convexo, apiculato; peristomio interno libero, ciliis rudimentariis seu nullis."—*Bryol. Europ.*

Pohlia inclinata, *Swartz, Musc. Suec.*, pp. 45, 96. t. 5. f. 11; *Brid. Mant. Musc.*; *Schwægr. Suppl.* i. pt. ii. p. 73. t. 63.

Br. turbinatum, var. *Muscol. Brit.*; *Walker-Arnott, Dispos. meth.*

However questionable may be the propriety of disuniting *Br. cernuum* and *inclinatum*, I cannot doubt that the latter is a very distinct species. I gathered in Teesdale, between the two, above twenty varieties, *all* equally distinct from *Br. cæspititium*, to which, in point of fact, *Br. inclinatum* is far more closely allied than to *Br. turbinatum*, whither it has been referred by Walker-Arnott and the authors of 'Musc. Brit.' *Br. inclinatum* may be distinguished at sight from *Br. cæspititium* by its *capsule* tapering nearly equally to each extremity (often exactly spindle-shaped) and by its far smaller and more pointed operculum; besides, the *leaves* have less of that silky appearance to be observed in the other, their nerve is less produced, and they are furnished with a border of three rows of narrow cellules. The *inflorescence* is constantly hermaphrodite (dioicous in *Br. cæspititium*); the *inner peristome* wants the intermediate cilia, or, if present, they are imperfect and destitute of the large and well-developed lateral hooks (appendiculæ) so remarkable in *Br. cæspititium*; and lastly, *the seeds are three times the diameter* of those of *Br. cæspititium*.

Although *Br. inclinatum* and *cernuum* exist abundantly in Teesdale, only a single alpine habitat was observed for *Br. cæspititium*.

In accordance with this is the remark of Bruch and Schimper on the latter species, "montes editiores vix apud nos ascendere videtur."

34. *Bryum julaceum*, Smith. Caldron Snout, very scarce.

35. *Br. nutans*, Schreb. Heathy situations, as well as on walls and stones.

36. *Br. obconicum*, Hornsch. in litt. "Dioicum, innovando ramosum; foliis ovatis, oblongo-ovatis, acuminatis, costa procurrente cuspidatis, submarginatis, margine non incrassato revoluto-recurvis, integris, concavis, apicem versus carinatis, erectiusculis, siccis vix tortilibus; capsula subpendula, pendula, longicolla, clavata, operculo hemisphærico, papillato."—*Bryol. Eur.*

On a wall, under the shade of trees, by the road leading out of Barnard Castle to Lartington, along with *Br. capillare* and *cernuum*.

This beautiful species, which is mentioned by the authors of 'Bryol. Eur.' as being "e rarioribus," is distinguished from *Br. capillare* at first sight by its long slender capsule, emulating that of *Br. elongatum*, yet "plurimo tempore perfecte pendula," and by the pedicel being curved in its upper portion into a much wider arc. It may be further distinguished by the following characters. *Leaves* tapering more gradually to a point, less distinctly marginated, of a fine deep green (those of *B. capillare* mostly with a yellowish or brownish tinge), their nerve stronger and always excurrent. Texture of the outer paries of the capsule very compact near its mouth, the 4—5 uppermost rows of cellules being far smaller than the rest, while in *B. capillare* only one or two of the rows near the mouth are slightly contracted in dimensions. *Operculum* larger, more convex. *Annulus* very large, nearly twice the breadth of that of *B. capillare*. Teeth of outer peristome with a broader red base, within the capsule.

Br. torquescens, B. and S. (of which I have not yet seen any specimen), is mentioned by Bruch and Schimper as a species which might be confounded with *Br. obconicum*, but the latter (say they) may be distinguished by its more slender capsule, with a longer neck, and by the leaves, which are of a different form and twist less regularly in drying. Besides, the inflorescence of *Br. torquescens* is hermaphrodite.

37. *Br. pallescens*, Schwægr. "Monoicum, cæspitosum; caule ramoso, radiculoso-tomentoso; foliis ovato-lanceolatis, integerrimis, margine reflexis, costa sub vel paulo ultra apicem evanida; capsula horizontali, inclinata, pyriformi-oblonga, collo longiusculo, operculo convexo, longius acute acuminato."—*Bryol. Eur.*

Br. pallescens, *Schwægr. Suppl.* i. pt. ii. p. 67. t. 75; *Brid. Bryol. Univ.* i. p. 645.

Br. speciosum, *Voit.*

On rocks as well as on sandy deposits, by the Tees below Winch Bridge; Hell Cleft, very sparingly.

Var. *β. boreale.* (Br. boreale, *Schw.*) Rocks in Ettersgill beck.

Although fully satisfied that this is the moss described in the 'Bryol. Eur.,' having compared it with an original specimen from Bruch (given me by Mr. Wilson), I have had great difficulty in persuading myself of the validity of its specific claims; but this has chiefly arisen from my having got hold of some puzzling varieties, and I now think it may prove a genuine species; at the same time leaving it to further observation finally to decide the question. Bruch and Schimper's remark, "Cette espèce varie infiniment," would prepare one to expect some anomalies.

From *Br. inclinatum*, growing along with it and not very dissimilar in habit, *Br. pallescens* is to be distinguished by the following characters:—The *leaves* are cuspidate (not acuminate), except on the ramuli and innovations, where they are often narrower and run out into a longer point; their margins only *reflexed*, not *revolute* as in the other: the *inflorescence* is *normally* monoicous: the *capsule* has a longer neck and is mostly subclavate: the operculum is longer: the peristome is larger: the outer teeth far longer, tapering to a very slender point, and closely trabeculate; and the *seeds* are somewhat smaller. To this may be added, that the outer teeth are *strongly inflexed* by drying, while the processes of the inner *stand erect* between the interstices: this never occurs in the other.

The form which grows on the sandy margin of the Tees has the inner peristome very fragile, and the cilia scarcely appendiculate.

The large and beautiful var. from Ettersgill beck has the pedicels widely curved, and twisted just below the collum so as to bring the lower face of the capsule uppermost. I have found *antheridia* mixed with *archegonia* in two out of five or six fertile flowers that I have examined; yet separate gemmaceous male flowers are abundant on the same plants; and in all the other states of this species I have been unable to detect a single hermaphrodite flower*.

Bryum intermedium, Brid., is considered the nearest ally of *Br. pallescens* by Bruch and Schimper, from whom I quote the following diagnosis: "Quelque grande que soit la ressemblance, même dans les variétés, du *Br. pallescens* avec le *Br. intermedium*, ces deux espèces ne sauroient cependant pas se confondre, vu la différence dans la fleuraison. La première espèce se reconnaît en outre, et déjà à la première vue, à la couleur plus pâle de la

* I do not conclude from the accidental occurrence of androgynous flowers in a monoicous species, that the authors of 'Bryol. Eur.' have been altogether in error in adopting the inflorescence as a character for discriminating species: nature always refuses to be bound by our artificial rules, and there is no character *taken singly* which may not admit of exception. Sexual anomalies exist amongst flowering-plants as well as mosses: *e. g.* in the genus *Carex*, *Myrica Gale*, *Lychnis dioica*, *Bryonia dioica*, &c.

capsule, dont l'opercule ne porte toujours qu'une pointe mousse très-courte, et se détache facilement quand le fruit est mis en contact avec l'humidité. Il faut encore remarquer que la capsule est toujours symmétrique, et que son col n'est jamais courbé vers le bas, comme cela se voit si souvent dans le *Br. intermedium*; à l'état sec, même quand elle est encore fermée par son opercule, elle se trouve toujours rétrécie sous l'orifice. Le péristome est plus grand, *et tous les fruits mûrissent à la même époque.*"

38. *Bryum pseudotriquetrum*, Schwægr. (Br. ventricosum, *Dicks.*; *H. and T.*)

Abundant on the rocky banks of streams, and in moist springy places on the mountains. I gathered numerous forms, varying chiefly in habit and in the length of the capsule, but presenting no essential difference.

39. *Br. turbinatum*, Swartz. Rocky situations near streams, but with fruit scarcely mature. A small and broad-leaved var. of this occurs below Winch Bridge, in which the tufts are beautifully zoned with red and purple, their upper portion being green. A similar var. of *Br. pseudotriquetrum* grows on Cronkley Fell.

40. *Br. Zierii*, Dicks. Basaltic rocks at the High Force, Holwick Scarr, Caldron Snout, &c., in moist shaded situations: the capsules immature at the time of my visit. The vinous tinge of the foliage on the lower part of the stem distinguishes this species at sight from *Br. argenteum* and *julaceum*.

[To be continued.]

XXVII.—*On the Nidi of* Purpura lapillus *and of* Buccinum reticulatum. By Mr. Charles Wm. Peach.

Purpura lapillus.

In my former communication relating to this shell, I had only noticed it depositing its nidi from January to June of that year; since that time I find that it deposits them all the year round, but is most active from January to April. The young leave the nidi in about four months from the time of their being fixed on the rocks; they are fixed to rocks only. My eldest boy took one of the whelks from the rock, when it deposited a nidus on his hand in my presence which was perfectly formed, quite transparent; and although the granular marks were plainly to be seen, *no appearance of shells could be traced under a powerful pocket lens on the bursting of the nidus.* The nidus was so frail, that it fell to pieces on being touched.

Buccinum reticulatum.

This shell differs from the former in fixing its nidi on rocks, algæ, and the wicker-work of "hullies," or the store-pots of the