

This article was downloaded by: [Virginia Tech Libraries]  
On: 25 February 2015, At: 04:29  
Publisher: Taylor & Francis  
Informa Ltd Registered in England and Wales Registered Number:  
1072954 Registered office: Mortimer House, 37-41 Mortimer Street,  
London W1T 3JH, UK



## Annals and Magazine of Natural History: Series 2

Publication details, including instructions for  
authors and subscription information:

<http://www.tandfonline.com/loi/tnah08>

### XLVIII.—The Musci and Hepaticœ of the Pyrenees

Richard Spruce

Published online: 16 Dec 2009.

To cite this article: Richard Spruce (1849) XLVIII.—The Musci and Hepaticœ of the Pyrenees , Annals and Magazine of Natural History: Series 2, 3:18, 478-503, DOI: [10.1080/03745485909495644](https://doi.org/10.1080/03745485909495644)

To link to this article: <http://dx.doi.org/10.1080/03745485909495644>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

XLVIII.—*The Musci and Hepaticæ of the Pyrenees.*

By RICHARD SPRUCE.

[Continued from p. 380.]

Tribus 20. BRUCHIACEÆ, C. Muell.

44. *Astomum*, Hampe.

256. *A. nitidum*, Hedw. Musc. Frond. i. t. 34 (sub *Phasco*); Br. Europ. *Phascum*, p. 12. t. 6; M. P. 322.

*Hab.*  $Z_{0-1}$  P. c. in argillosis humidis secus viarum latera in valle Trébons, rarissime! P. occ. circa Dax (Grateloup in Fl. Française).

257. *A. alternifolium*, Brid. Mant. Musc. p. 10 (sub *Pleuridio*). *Phascum altern.*, Br. Europ. ! l. c. p. 15. t. 7 (non Dicks., nec Schwgr.).

“Var. 1, antheridiis in floribus cauligenis gemmiformibus; etiam paraphysibus absque antheridiis (rarissime antheridiis nonnullis abortivis adjectis) in axillis foliorum superiorum dispositis;” M. P. 323.—*Hab.*  $Z_1$  in arenosis humidis circa Jurançon.

“Var. 2, antheridiis absque paraphysibus in floribus gemmiformibus, et insuper antheridiis paraphysatis numerosis (nonnunquam *quinis*) in foliorum superiorum axillis;” M. P. 324.—*Hab.*  $Z_{0-1}$  in arenosis circa St. Sever, Pau et B.-de-Bigorre.—“Florescentia valde variabilis; species distincta tamen à *Ph. subulato* foliis perichaetialibus videtur. Confer Br. Europ.,” M. P. l. c.

The inflorescence of *Phascum alternifolium* and of several other mosses (*e. g.* certain *Brya*) is by no means so constant to the type assigned in ‘Bryologia Europæa’ as the authors of that work would lead one to suppose; and fully prepared as I am to acknowledge the importance of the characters derived from the inflorescence, it appears to me that science will lose rather than gain if we shut our eyes to the aberrations which it undeniably presents. To assume a greater degree of invariableness in the inflorescence than exists in any other part of the plant, is as illogical as in practice it is found to be inaccurate.

Tribus 21. SELIGERIACEÆ.

(*Seligeriaceæ* et *Campylosteliaceæ*, Bryol. Europ.)

45. *Campylostelium*, Bryol. Europ.

258. *C. saxicola*, W. et M. Bot. T. p. 167 (sub *Dicrano*); Br. Europ. *Campylost.* p. 3. t. 1.

*Hab.*  $Z_2$  P. c. locis umbrosis in saxis arenaceis. Labassère. V. de Castelloubon.

46. *Brachyodus*, Fürnrohr.

259. *B. trichodes*, Mohr, Crypt. Gew. p. 85 (sub *Gymnostomo*);

Mr. R. Spruce on the *Musci and Hepaticæ of the Pyrenees*. 479

Br. Europ. *Brachyodus* (cum icone). *Weisia trichodes*, H. et T. !  
Musc. Brit. p. 82. t. 15 ; M. P. 228.

*Hab.* Z<sub>1</sub> P. c. in rupibus argillaceo-schistosis prope thermas  
dict. de Salut, B.-de-Bigorre, rarissime.

47. *Seligeria*, Bryol. Europ. (ex parte).

260. *S. Doniana*, Smith, E. Bot. t. 1582 (sub *Gymnostomo*) ;  
C. Muell. Syn. Musc. p. 420. *Anodus Donianus*, Br. Europ.  
(cum icone).

*Hab.* Z<sub>1</sub> P. c. in rupibus calcareis occultis prope B.-de-Bigorre  
(Philippe!).

261. *S. pusilla*, Hedw. Musc. Frond. ii. t. 29 (sub *Weisia*) ;  
Br. Europ. *Seligeria*, p. 4. t. 1 ; M. P. 227.

*Hab.* Z<sub>1-3</sub> P. occ. in rupibus calcareis udis ad *Narcastet* prope  
*Pau*. P. c. in rupibus schistosis vallis *Castelloubon* et in ascensu  
ad *Port de Bénasque*.

262. *S. recurvata*, Hedw. Musc. Frond. i. t. 38 (sub *Grimmia*) ;  
Br. Europ. *Seligeria*, p. 6. t. 3 ; M. P. 229.

*Hab.* Z<sub>1</sub> P. c. in rupibus graniticis et arenaceis, locis *Gavar-*  
*nie*, *V. de Castelloubon* et *Lesponne*, *Labassère* et *Superbagnères*.

Tribus 22. DICRANACEÆ, Bryol. Europ. (ex parte).

48. *Ceratodon*, Bridel.

263. *C. purpureus*, Linn. (sub *Mnio*) ; Br. Europ. *Ceratodon*,  
p. 5. t. 1, 2. *Dicranum purpureum*, Hedw. Sp. Musc. p. 136. t. 36.

*Hab.* Z<sub>0-4</sub> ad terram, in habitationum vicinia præcipue, socio  
*Funaria hygrometrica*.

264. *C. cylindricus*, Hedw. Sp. Musc. t. 24 (sub *Trichostomo*) ;  
Br. Europ. *l. c.* p. 6. t. 3 ; M. P. 201. *Angstræmia cylindrica*,  
C. Muell. Syn. Musc. p. 441.

*Hab.* Z<sub>1</sub> P. c. in rupibus arenaceis fragilibus montis *Superba-*  
*gnères* : nusquam alias observatus.

49. *Cynodontium*, Bryol. Europ.

265. *C. Bruntoni*, Smith, E. Bot. t. 2509 (sub *Dicrano*) ; Br.  
Europ. *Cynodontium* (cum ic.) ; M. P. 210. *Didymodon obscu-*  
*rus*, Kaulf. ; Grev. ! Scot. Cr. Fl. t. 193.

*Hab.* Z<sub>1</sub> in sylvis, rupestre. P. occ. *Bagès* prope les *Eaux*  
*Bonnes*. P. c. *V. du Lys* ; *Bois de Gouerdère* ; *V. de Lesponne*  
(Philippe!). P. or. in radice montis *Canigou* (Montagne!).

50. *Dicranum*, Hedwig.

§ 1. POLYCARPA, Br. Europ.

266. *D. polycarpum*, Hedw. Musc. Frond. ii. p. 85. t. 31 (sub  
*Fissidente*) ; M. P. 209.

*Hab.* Z<sub>1</sub> sup.-2 in virgultis, rupestre.

480 Mr. R. Spruce on the Musci and Hepaticæ of the Pyrenees.

Var.  $\beta$ . *strumiferum*, Br. Europ. *Fissidens strumifer*, Hedw.  
—*Hab.* in rupibus umbrosis convallium Jéret et Castelloubon.

§ 2. VIRENTIA, Br. Europ.

267. *D. virens*, Hedw. Musc. Frond. iii. p. 77. t. 32.

*Hab.*  $Z_{2-3}$  P. c. in sylvis humidis vallis Lesponne (Dufour ! Philippe !). P. or. V. d' Eynes (Arnott !).

§ 3. SQUARROSA, Br. Europ.

268. *D. flavescens*, Dicks. Crypt. fasc. 2. p. 4 (sub *Bryo*). *Dicranum flav.*, Smith ! Fl. Brit. p. 1224 et E. Bot. t. 2263 ; M. P. 213. *D. pellucidum* var.  $\gamma$ . *serratum*, Br. Europ.

*Hab.*  $Z_{1\text{sup}}$  P. occ. in arena torrentis ad latus boreale montis Goursi prope les Eaux Bonnes. P. c. loco simili vallis Lesponne.

269. *D. pellucidum*, L. Sp. Pl. p. 1583 (sub *Bryo*) ; Schwgr. Suppl. t. 48 ; M. P. 214.

*Hab.*  $Z_{1-2}$  in rivulorum glareosis.

270. *D. squarrosus*, Schrad. Bot. Journ. v. p. 68 ; Br. Europ. *Dicranum*, p. 17. t. 5. *Angstræmia squarr.*, C. Muell. Syn. Musc. p. 438.

*Hab.*  $Z_{1-2}$  in arena rivulorum : haud vulgare et semper absque fructu. V. de Lesponne, &c.

§ 4. CRISPA, Br. Europ.

271. *D. Schreberi*, Hedw. Sp. Musc. p. 144. t. 33 ; Br. Europ. l. c. p. 18. t. 6. *Angstræmia Schr.*, C. M. Syn. Musc. p. 438.

*Hab.*  $Z_{0-1}$  P. occ. in rupibus ophiticis humidiusculis Sti. Pandelon prope Dax : fertile sed rarissimum. P. c. ad terram in occultis prope B.-de-Bigorre : sterile.

§ 5. RUFESCENTIA, Br. Europ.

272. *D. varium*, Hedw. Musc. Frond. ii. t. 34 ; M. P. 222. *Angstræmia varia*, C. M. Syn. Musc. p. 435.

*Hab.*  $Z_{0-1}$  in terra nuda subhumida, haud vulgatum.

273. *D. rufescens*, Turn. Musc. Hibern. p. 66 ; Smith ! Fl. Brit. p. 1210, et E. Bot. t. 1216 ; M. P. 223. *Angstræmia ruf.*, C. M. Syn. Musc. p. 436.

*Hab.*  $Z_1$  P. occ. et c. in argillaceo-arenosis circa Pau et B.-de-Bigorre, sat frequens.

§ 6. HETEROMALLA, Br. Europ.

274. *D. curvatum*, Hedw. Sp. Musc. t. 31 ; M. P. 221. *Angstræmia curv.*, C. M. Syn. Musc. p. 433.

*Hab.*  $Z_{1-2}$  P. c. in declivibus graminosis umbrosis vallis Lesponne et monticuli Olivet, ut et in sylva dict. Bois de Gouerdère : socio *Trichost. homomallo*. P. occ. ad terram in valle Jéret.

275. *D. heteromallum*, L. Sp. Pl. p. 1583 (sub *Bryo*) ; Br.

Europ. *Dicranum*, t. 15. *Angstræmia heter.*, C. M. Syn. Musc. p. 432.

*Hab.*  $Z_{0-2}$  in solo arenaceo.

Var. caespitibus elongatis compactis; capsulis nonnullis subrectis; M. P. 220.—*Hab.* in rupibus ophiticis et arenaceis P. c. locis *Labassère et Superbagnères.*

§ 7. *FALCATA*, Br. Europ.

276. *D. Starkii*, W. et M. Bot. T. p. 189; Br. Europ. *Dicranum*, p. 27. t. 17. “*D. falcatum*,” M. P. 219.

*Hab.*  $Z_{3-4}$  in montibus editioribus, rupestre. P. c. *Mt. Mala-detta*; *Mt. Crabioules*; *Esquierry*; *Lac d’Espingo*; *En montant au Lac Lehou* (Dufour!). P. or. loco non designato (Arnott!).

I gave this in ‘*Musci Pyrenaici*’ as *D. falcatum*, as being the older name and under the supposition that *D. Starkii* was not a distinct species; but I had then seen no *authentic D. falcatum*. The latter I am now convinced differs essentially in the smaller size, the *more rigid habit*, the *leaves more strongly* and uniformly *hooked*, with slenderer points, not flexuose when dry; the *shorter* and redder *capsules*, which are not subcylindrical but *obovate*, and are *not strongly sulcate when dry*; lastly in the redder teeth, which are also wider and less deeply cloven.

277. *D. falcatum*, Hedw. Sp. Musc. t. 32; Br. Europ. *l. c.* t. 18.

*Hab.*  $Z_{3-4}$  P. c. secus lacus *Lehou* ripas (Philippe!).

§ 8. *ORTHOCARPA*, Br. Europ.

278. *D. montanum*, Hedw. Sp. Musc. p. 145. t. 35. “*D. flagellare*, Hedw.” M. P. 208.

*Hab.*  $Z_1$  P. occ. et c. ad truncos vetustos in sylvis supra pagum *Jurançon* et circa *B.-de-Bigorre*.

279. *D. fulvum*, Hook. Musc. Exot. t. 149; Sullivant! Musci Allegh. n. 159; M. P. 207. *D. interruptum*, Brid. Musc. Rec. 2. P. 1. p. 159, fide Bryol. Europ. (non *D. interruptum*, Smith! Fl. Brit. p. 1205).

*Hab.*  $Z_1$  sup. P. c. ad saxa granitica in sylvis convallium *Burbe* et *du Lys* prope *B.-de-Luchon*.

280. *D. Sauteri*, B. et S.! Br. Europ. *l. c.* p. 33. t. 24; M. P. 206.

*Hab.*  $Z_{2-3}$  P. occ. in abiegnis nigris vallis *Jéret*; P. c. in regione inferalpina montis *Crabioules*: saxa granitica obtegens.

281. *D. longifolium*, Hedw. Musc. Frond. 3. p. 24. t. 9; M. P. 205.

*Hab.*  $Z_2$  P. c. ad saxa granitica in nemore nigro secus cataractam dict. *Cascade du Cœur*, etiam in monte *Superbagnères*. P. or. *Port Nègre* (Arnott!).

*Ann. & Mag. N. Hist.* Ser. 2. Vol. iii.

§ 9. SCOPARIA, Br. Europ.

282. *D. scoparium*, Linn. ! Sp. Pl. p. 1582 (sub *Bryo*). *Dicranum scop.*, Hedwig; Smith ! Fl. Brit. p. 1201; Br. Europ. l. c. t. 26; M. P. 217.

*Hab.* Z<sub>1-2</sub> in sylvaticis, copiose.

283. *D. fuscescens*, Turn. ! Musc. Hibern. p. 60 (1804); Smith ! Fl. Brit. p. 1204 (1804), et E. Bot. t. 1597; M. P. 218. *D. congestum*, Brid. Sp. Musc. l. p. 176 (1806); Br. Europ. l. c. t. 29.

*Hab.* Z<sub>1 sup.-2</sub> P. occ. ad rupes graniticas et argillaceo-schistosas in vicinia oppiduli *Cauterets*, locis *Pont d'Espagne* et *Gorge de Cauterets*.

§ 10. SPURIA, Br. Europ.

284. *D. spurium*, Hedw. Musc. Frond. 2. t. 20; Smith ! Fl. Brit. p. 1222, et E. Bot. t. 2167; M. P. 215.

*Hab.* Z<sub>0-1</sub> P. occ. in ericetis Agri Syrtici loco *Landes de Mu-griet*, necnon in monte *Goursi*.

§ 11. UNDULATA, Br. Europ.

285. *D. undulatum*, Schrad.; Smith ! Fl. Brit. p. 203; Sullivant ! Musci Allegh. n. 156. *D. polysetum*, Sw. Musc. Suec. p. 34 et 87; Schwgr. Suppl. t. 41; M. P. 216.

*Hab.* Z<sub>1</sub> in campis sylvarum gramineis, semper absque fructu. P. occ. *Bois de Jurançon*, &c. P. c. *V. de Serris*.

286. *D. majus*, Smith ! Fl. Brit. 3. p. 1202, et E. Bot. t. 1490; Br. Europ. l. c. t. 37.

*Hab.* Z<sub>2</sub> P. c. in rupibus umbrosis subhumidis vallis *Lesponne*; nullo alio loco in Pyrenæis mihi notum !

§ 12. (= ARCTOA, Br. Europ.)

287. *D. fulvellum*, Dicks. Crypt. fasc. 4. t. 11. f. 1 (sub *Bryo*). *Dicranum fulvellum*, Smith; H. et T. ! Musc. Brit. p. 103. t. Suppl. 3; M. P. 224. *Arctoa fulvella*, Br. Europ. *Arctoa*, p. 4. t. 1; et *A. hyperborea*, Br. Europ. ! l. c. p. 5. t. 2.

*Hab.* Z<sub>4</sub> P. c. in rupibus subhumidis. *Esquierry*. *Crabioules*. *Lac Lehou*.

The Pyrenean specimens have the leaves of *Arctoa fulvella* (Br. Europ.), and the striated capsules of *A. hyperborea*. All the British specimens that I have seen under the name of *Dicranum fulvellum* have the capsule striated, while the leaves exhibit all intermediate forms between those attributed to *A. fulvella* and to *A. hyperborea*; hence I do not hesitate to consider these two mosses mere forms of one and the same species.

51. *Blindia*, Bryol. Europ.

288. *B. acuta*, Hedw. Musc. Frond. 3. t. 35 (sub *Weisia*); Br. Europ. *Blindia* (cum ic.); M. P. 225.

*Hab.* Z<sub>2</sub> P. occ. et c. in rupibus humidis vallis Jéret, necnon ad rupes cataractæ Cascade du Cœur humectatas : rarior.

52. *Campylopus*, Bridel.

289. *C. longirostris*, W. et M. Bot. Tasch. p. 155 (sub *Didymodonte*) ; M. P. 202. *Cynodontium longir.*, Schwgr. Suppl. t. 29. *Dicranodontium longir.*, Br. Europ. fasc. 41 (cum icone). *Dicranum denudatum*, Brid. ; C. M. Syn. Musc. p. 403.

*Hab.* Z<sub>1-2</sub> P. occ. et c. supra ligna putrida, rarius ad rupes. Vallées de Lutour et du Lys, &c.

290. *C. fragilis*, Br. Europ. ? fasc. 41. p. 4. t. 2. *Dicranum Funkii*, C. M. Syn. Musc. p. 392.

*Hab.* Z<sub>2</sub> P. occ. in sylvis subhumidis circa les Eaux Bonnes : sterilis.

291. *C. atrovirens*, De Not. Syllab. Musc. p. 221 ; Br. Europ. fasc. 41. p. 5. t. 4. *Dicranum atr.*, C. M. Syn. Musc. p. 413.

*Hab.* Z<sub>2</sub> in sylvarum rupibus humidis, sterilis. P. occ. Mt. Goursi. P. c. V. de Castelloubon.

292. *C. longipilus*, Brid. Bryol. Univ. 1. p. 477 ; Br. Europ. fasc. 41. p. 6. t. 5 ; M. P. 203. *Dicranum longip.*, C. M. Syn. Musc. p. 411.

*Hab.* Z<sub>1</sub> P. occ. in saxis graniticis prope oppidulum Laruns.

† *C. elongatus*, Bridel : "caule indiviso elongato radiculoso-tomentoso apice fastigiato-ramoso, ramulis penicillatis, foliis caulinis inferioribus dissitis superioribus dense imbricatis omnibus appressis lineari-lanceolatis nervo latissimo obsoleto."

"*Hab.* circa Dax Aquitanix ubi D. Grateloup legit. Herb. Cand." Br. Univ. 1.

I suspect there is some mistake about the station attributed to this moss, which has a habit quite different from that of any European *Campylopus*. May it not have been inadvertently transposed from Dr. Grateloup's exotic Cryptogamia (from the Mauritius, Guadeloupe, &c.) to his collection of native French species ?

Tribus 23. WEISIACEÆ.

(*Weisiaceæ* et *Antectangiaceæ*, Bryol. Europ.)

53. *Eucladium*, Bryol. Europ.

293. *E. verticillatum*, L. Sp. Pl. p. 1585 (sub *Bryo*) ; Br. Europ. *Eucladium* (cum ic.) ; M. P. 226.

*Hab.* Z<sub>1</sub> in declivibus calcareis subhumidis.

54. *Rhabdoweisia*, Bryol. Europ.

294. *Rh. fugax*, Hedw. Sp. Musc. t. 13 (sub *Weisia*) ; Br. Europ. *Rhabdow.* p. 4. t. 1. *Dicranum striatum*, M. P. 211.



*Hab.*  $Z_{1-2}$  P. occ. et c. ad rupes schistosas umbrosas, haud infrequens. In rupium madidarum fissuris faucium *Gorge de Caunterets* dict., pulcherrime !

295. *Rh. denticulata*, Brid. Suppl. Musc. 1. p. 108 (sub *Weisia*) ; Br. Europ. l. c. p. 5. t. 2. *Dicranum denticulatum*, M. P. 212.

*Hab.*  $Z_{1-2}$  in rupium fissuris P. c. circa *B.-de-Luchon*, locis *V. du Lys*, *Bois de Gouerdère* et *Lac de Séculéjo*.

# 55. *Weisia*, Hedwig.

296. *W. cirrhata*, Hedw. Sp. Musc. p. 69. t. 12 ; Br. Europ. *Weisia*, p. 9. t. 6 ; M. P. 230.

*Hab.*  $Z_0$  P. occ. in *Pini Piceæ* trunco in Agro Syrtico loco *Landes de Mugriet*. *Les Terres des Landes* (Gratcloup).

297. *W. crispula*, Hedw. Sp. Musc. p. 68. t. 12 ; Br. Europ. *Weisia*, p. 9. t. 7 ; M. P. 231.

*Hab.*  $Z_{2-5}$  per *Pyrenæos* in saxis graniticis et schistosis, e subalpinis usque ad nives æternas.

Var.  $\beta$ . *atrata*, Br. Europ. l. c. (=  $\beta$ . *nigrescens* et  $\gamma$ . *atrata*, Br. Germ. p. 67. t. 30) ; M. P. 232.—*Hab.* in rupium subhumidarum fissuris loco *Port de Bénasque*.

This moss is equally alpine and arctic, and there is scarcely any other which flourishes and fructifies in such high latitudes and altitudes. It was gathered abundantly in Captain Parry's northern voyages, and Wahlenberg remarks of it, "in albis omnibus altius ascendit prope nivem perennem, quam quis alius muscus (excepto forsân *Polytricho juniperino*)."

298. *W. viridula*, L. Sp. Pl. p. 1584 (sub *Bryo*) ; Brid. Br. Univ. 1. p. 334 ; Br. Europ. *Weisia*, p. 5. t. 2, 3. *W. contraversa*, Hedw. Musc. Frond. 3. t. 5 ; M. P. 233.

*Hab.*  $Z_{0-2}$  in terra ubique.

"Var. foliis nervo crasso instructis ; capsula inclinata, ovali et ovali-cylindrica, stomate subobliquo rubello ; peristomii dentibus brevibus, irregularibus, albidis ; floribus masculis gemmiformibus in ramis propriis terminalibus : rarissime antheridiis 1-2 in perichætio fœmineo ;" M. P. 235.—*Hab.* in muris prope *Pau*, socio *Hymenost. tortili*.

This seems to be the var.  $\delta$ . *amblyodon* of the 'Br. Europ.' ; *W. amblyodon*, Brid. Br. Univ. 1. p. 805 ; *W. amblyodon*, *gymnostomoides* and *microdonta*, Br. Germ. t. 25 et 37. In the rigid habit and in the form of the leaves it precisely resembles *Hymenost. tortile*, along with which it grew.

299. *W. Wimmeriana*, Sendtner in Denkschr. d. Regensburg. (sub *Gymnostomo*) ; Br. Europ. *Weisia*, p. 4. t. 1. "*W. contraversa* var. 2, antheridiis 2-3nis in axillis fol. superiorum dispo-

sitis;" M. P. 234; et *Hymenostomum murale*, M. P. 236 (*forma hymenostomoides*).

*Hab.* Z<sub>1</sub> P. occ. in arenosis circa Pau et Oloron; No. 236. M. P. in muris prope Ste. Marie d'Oloron.

The moss published in 'Musci Pyrenaici' as *Hymenostomum murale* (n. sp.) I have ascertained to be a form of *Weisia Wimmeriana*. Not one of the capsules I at first examined showed the least trace of peristome, but by renewed search I have at length found a capsule in which there are a few pale rudimentary teeth, scarcely rising above the annulus. As some excuse for this, it may be mentioned that *Weisia Wimmeriana* was originally referred to *Gymnostomum* by both Sendtner and Schimper.

#### 56. *Hymenostomum*, R. Brown.

300. *H. microstomum*, Hedw. Musc. Frond. p. 71. t. 30 (sub *Gymnostomo*); Br. Europ. *Hymenost.* p. 4. t. 1.

*Hab.* Z<sub>1</sub> ad terram, rarissime! B.-de-Bigorre. Pyrénées Orientales (Montagne!).

301. *H. tortile*, Schwgr. Suppl. t. 10 (sub *Gymnostomo*); M. P. 237.

*Hab.* Z<sub>1</sub> inf. P. occ. in muris prope Pau. P. c. in rupibus calcareis juxta thermas dict. de Salut, B.-de-Bigorre. Circa Montpellier et Vacluse (Arnott!).

#### 57. *Gymnostomum*, Hedwig.

302. *G. calcareum*, H. et N. Bryol. Germ. p. 183. t. 10; Br. Europ. *Gymnostomum*, p. 6. t. 3, 4; M. P. 239.

*Hab.* Z<sub>1</sub> in calce arenato murorum ad pedem Pyr. occidentaliū.—Var. *β. tenellum*, Br. Europ. l. c.; Pau, Jurançon, &c.—Vars. *γ. viridulum* (= *G. viridulum*, Brid.) et *δ. gracillimum* (= *G. gracillimum*, Br. Germ.); Rontignon et Pau.

This species varies exceedingly in the length of the leaves and in the form of their apices. A small variety on walls at Pau has the leaves shortly ligulate, mostly widest above the middle, and often quite rounded at the summit. In the village of Rontignon, which is seven or eight miles higher up the banks of the Gave de Pau, the varieties *γ.* and *δ.* grow intermixed, both having the leaves for the most part subacute. All the forms observed in the Pyrenees have far wider and shorter leaves than specimens I have received from the Alps, and I never once met with the form considered by Bruch and Schimper as the type of the species. [Confer 'Bryol. Europæa,' monogr. *Gymnost.* p. 7; where however it is said by mistake that my specimens were gathered "in schisto micaceo;" but it is nevertheless true that the mortar used in the neighbourhood of Pau, being made of lime mixed with the sand of the Gave de Pau, contains particles of mica, granite, &c. brought down from the mountains by this stream and its tributaries.]

303. *G. rupestre*, Schwgr. Suppl. t. 10; H. et T. ! Musc. Brit. ed. 2. p. 19. t. Suppl. 2; M. P. 238.

*Hab.*  $Z_{1-2}$  in rupibus humidis tam calcareis tam argillaceo-schistosis, frequens. *Pierrefitte*; *Penticosa*; *Gavarnie*, &c. *V. d'Eynes* (Arnott!).

304. *G. curvirostrum*, Hedw. Musc. Frond. 2. t. 24; Br. Europ. l. c. p. 8. t. 7, 8; M. P. 240.

*Hab.*  $Z_{2-3}$  in rupibus humidis præcipue argillaceo-schistosis. P. occ. circa thermas *les Eaux Bonnes* et *les Eaux Chaudes* dictas. P. c. circa *B. de Luchon*, locis *Esquierry* et *Lac de Séculéjo*\*.

58. *Anæctangium*, Schwaegr.

305. *A. compactum*, Schwgr. Suppl. t. 11; Br. Europ. *Anæctangium*, p. 5. t. 1; M. P. 241.

*Hab.*  $Z_2$  P. c. ad rupes irroratas circa *Bagnères-de-Luchon*, locis *Lac de Séculéjo*, *Cascade du Cœur* et *Superbagnères*: plerumque fertile.

Tribus 24. ZYGODONTÆ, Bryol. Europ.

59. *Zygodon*, Hooker et Taylor.

306. *Z. Mougeotii*, B. et S. ! Br. Europ. fasc. 4. p. 7. t. 1; M. P. 242.

\* In the Supplement to the 1st volume of Bridel's 'Bryologia Universa' the two following gymnostomous mosses are described, and said to grow near Dax:—

"*Gymnostomum homomallum*, Brid.; caule erecto simplicissimo, foliis lanceolatis acutis integerrimis supremis e nervo crasso excurrente longissime subulatis secundis, thecæ oblongæ operculo conico-rostrato incurviusculo.

"Circa Dax ad terram cæspitosam legit D. Grateloup; clar. Candolleus communicavit.

"A *Didymodonte homomallo*, quem habitu proxime refert dignoscitur statura duplo minore, caule simplicissimo, foliorum supremorum longitudine et areolatione, præprimis stomate nudo."—Br. Univ. 1. p. 757.

May not this be *Trichostomum subulatum*, Bruch, with which it agrees well enough except as to the peristome, which may have been overlooked?

"ENTOSTHYMENIUM, Brid.

"*Character essentialis.* Stoma externe nudum; interne membrana angusta annulari margine tandem lacinulata instructum. Calyptra cuculliformis. Theca subinæqualis, apophysata.

"*E. tristichum*, Brid.; caule erecto ramosiusculo, foliis patentibus siccitate incurvis subtristichis ovato-lanceolatis acutiusculis solidinerviis, thecæ ovatæ subinclinatæ apophysi basilari parva.

"In Gallia australi circa Dax D. Grateloup detexit; Candolleus communicavit. Cæspitibus fastigiatis vivit.

"*Barbulam* e toto habitu, foliorumque forma et areolatione diceret, at membrana annularis et apophysis proprium genus declarant."—Br. Univ. 1. p. 761.

I confess myself unable to form a probable guess as to what this moss really is: the possessors of the Bridelian herbarium must decide.

*Hab.*  $Z_{1-2}$  per Pyrenæos sylvaticos, rupestris, frequens sed rarissime fructificans; juxta lacum *Séculéjo* capsulis deoperculatis, 22 Sept. 1845, legi.

307. *Z. viridissimus*, Smith, Fl. Brit. p. 1224 (sub *Dicrano*); Br. Europ. l. c. p. 7. t. 1; M. P. 243.

*Hab.*  $Z_1$  ad arbores circa *Pau* et *Bagnères*, plerumque sterilis.

308. *Z. conoideus*, Schwgr. Suppl. 2. p. 138. t. 137; Br. Europ. l. c. p. 8. t. 2.

*Hab.*  $Z_1$  P. c. in truncis populi vetustis juxta pagum *Pouzac*! (Philippe!). *Estafforte*, *Hte. Garonne* (Brondeau in hb. Dufour).

In these specimens the leaves are often nerved throughout, and the nerve even excurrent into a short mucro. The sporular sac rises above the mouth of the capsule before it is divided into cilia, which are two cellules in breadth near the base, sometimes sixteen in number, the intercalary cilia being far shorter than the others.

#### Tribus 25. PTYCHOMITRIÆ.

##### 60. *Ptychomitrium*, Bryol. Europ.

309. *P. polyphyllum*, Dicks. Crypt. fasc. 3. p. 7 (sub *Bryo*); Br. Europ. *Ptychom.* p. 4. t. 1; M. P. 244.

*Hab.*  $Z_{1-3}$  in saxis graniticis regionum sylvaticarum: e vulgarissimis.

310. *P. incurvum*, Muehl. Cat. Plant. Amer. Sept. p. 98 (sub *Grimmia*). *Weisia incurva*, Schwgr. Suppl. 2. p. 51. t. 116. *Grimmia Muehlenbergii*, Brid. Br. Univ. 1. p. 181. *Ptychomitrium pusillum*, B. et S.! Br. Europ. *Ptychom.* p. 5. t. 1; Sullivant! Musci Allegh. n. 135.

*Hab.*  $Z_1$  P. occ. in muro prope *Oloron*. Cæspitem unicum inveni.

Leaves composed of two layers of cellules except near the base; the margins often thickened (= 2 cellules); the nerve = 3-5 cellules; the obtuse apex cucullate.

#### Tribus 26. ORTHOTRICHACÆ, Bryol. Europ. (ex parte).

##### 61. *Orthotrichum*, Hedwig.

*Obs.* This genus includes but few rupestral species, and only two of these (*O. anomalum* and *cupulatum*) have their normal station on calcareous rock. Of the species which inhabit the bark of trees, it is remarkable that those with an exerted capsule (*Ulot*, Bridel) prefer young oaks, while those with an immersed capsule prefer poplars.

##### § 1. (= *Ulot*, Bridel.)

311. *O. crispulum*, Bruch. Mst. in Brid. Br. Univ. 1. p. 793; Br. Europ.! *Orthotrichum*, p. 23. t. 12; M. P. 245.

*Hab.*  $Z_{1\text{inf}}$  ad arbores in sylvis Pyren. occidentaliū, locis *Jurançon*, *Gan*, &c.

312. *O. crispum*, Hedw. Musc. Frond. 2. t. 35; Br. Europ. !  
l. c. p. 23. t. 12; M. P. 246.

*Hab.*  $Z_{1-2}$  ad arborum truncos. In monte *Lhieris* peristomio interno 16-ciliato occurrit.

313. *O. Bruchii*, Brid. Br. Univ. 1. p. 744 (sub *Ulot*a). *O. coarctatum*, Br. Europ. l. c. p. 21. t. 11 (non P. Beauv.).

*Hab.*  $Z_1$  P. occ. ad arborum truncos in valle d'*Ossau* prope *Gan*, rarissime !

314. *O. Hutchinsiae*, Smith, E. Bot. t. 2523; H. et T. ! Musc. Brit. p. 131. t. 21; Br. Europ. l. c. t. 10; M. P. 247.

*Hab.*  $Z_{1\text{sup}}$  ad saxa granitica per Pyrenæos occidentales, in vicinia *Cauterets* et *Pierrefitte* præcipue.

315. *O. coarctatum*, Pal. Beauv. Prodr. p. 80. *O. Ludwigii*, Schwgr. Suppl. t. 51; Grev. ! Scot. Cr. Fl. t. 133; Br. Europ. l. c. t. 4; M. P. 248.

*Hab.*  $Z_{1-2}$  P. occ. et c. ad fruticem ramulos, frequens. *Mte. Verte*; *V. du Lys*; *Labassère*, &c.

316. *O. anomalum*, Hedw. Musc. Frond. 2. t. 37; Br. Europ. p. 10. t. 3; M. P. 249.

*Hab.*  $Z_1$  in saxis calcareis; in arborum truncis ad viam quæ ducit a pago *Loudervielle* ad *Port de Peyresourde* in Pyr. centralibus.

§ 2. (=ORTHOTRICHUM, Bridel.)

317. *O. leiocarpum*, B. et S. Br. Europ. l. c. p. 28. t. 15; M. P. 250. *O. striatum*, Schwgr. Suppl. t. 54 (vix Hedwigii); H. et T. Musc. Brit. ! p. 128. t. 21.

*Hab.*  $Z_1$  ad arborum corticem, frequens.

318. *O. Lyellii*, Hook. et Tayl. ! Musc. Brit. p. 76. t. 22; Br. Europ. l. c. p. 27. t. 16.

*Hab.*  $Z_1$  in arboribus, rarius. P. occ. *V. d'Ossau*. P. c. *B.-de-Bigorre*.

319. *O. diaphanum*, Schrad. Spicil. Fl. Germ. p. 69; Br. Europ. l. c. t. 14; M. P. 251.

*Hab.*  $Z_{0-1}$  ad arbores præcipue populos.

320. *O. patens*, Bruch in Brid.; Br. Europ. ! l. c. p. 17. t. 7.

*Hab.*  $Z_{1-\text{inf}}$  ad populorum truncos, rarissimum. P. occ. *Pau*; *Jurançon*. P. c. *B.-de-Bigorre* (Philippe !).

321. *O. stramineum*, Hsch.; Brid. Br. Univ. 1. p. 789; Br. Europ. ! l. c. p. 23. t. 13; M. P. 252.

*Hab.*  $Z_{0-2}$  ad truncos, vulgatissimum. *Oloron*; *Cauterets*; *V. de Campan*, &c.

"Var. 2, collo capsulæ longioris sporangium æquante, ciliis 8, vaginula vix pilosa;" M. P. 253.—*Hab.* ad populorum truncos in valle d'*Ossau* prope *Lourie*.

I am not certain that the authors of 'Bryol. Europ.' would not refer this to their *O. fastigiatum* (l. c. t. 8) : the vaginula is however always slightly hairy.

322. *O. pallens*, Bruch in Brid. Br. Univ. 1. p. 788 ; Br. Europ. l. c. p. 24. t. 13. "*O. stramineum*, var. 3. foliis capsulisque tenerioribus, vaginula nuda, ciliis semper 16;" M. P. 254.

*Hab.* Z<sub>1</sub> P. occ. ad arbores campestris prope *Louvie et Caute-rets*.

323. *O. speciosum*, Nees in Sturm. Deut. Fl. Crypt. hft. 16 ; Br. Europ. ! l. c. p. 19. t. 9 ; M. P. 255.

*Hab.* Z<sub>1</sub> ad frutices in sepibus, rarissimum. P. occ. *Luz.* P. c. *Vallée d'Aure* ; *B.-de-Bigorre* (Philippe !).

324. *O. affine*, Schrad. Spicil. Fl. Germ. p. 67 ; Br. Europ. l. c. p. 17. t. 7 ; M. P. 256.

*Hab.* Z<sub>0-2</sub> ad arborum truncos.

325. *O. tenellum*, Bruch in Brid. Br. Univ. 1. p. 786 ; Br. Europ. ! l. c. t. 6 ; M. P. 257.

*Hab.* Z<sub>0-1</sub> ad arborum truncos. P. occ. *St. Sever* ; *Pau.* P. c. *B.-de-Bigorre*.

Var. capsula *emersa*, subclavata ; calyptra *magna*, capsulam totam obtegente, straminea.—*Hab.* prope *St. Sever*.

326. *O. pumilum*, Schwgr. Suppl. t. 50 ; Br. Europ. ! l. c. p. 14. t. 5 ; M. P. 258.

*Hab.* Z<sub>1 inf.</sub> P. occ. et c. ad populos prope *Pau* et *B.-de-Bigorre*.

327. *O. rupestre*, Schleich. ; Schwgr. Suppl. t. 53 ; Br. Europ. ! l. c. p. 19. t. 9 ; M. P. 259. *O. rupicola*, Funck. ; Grev. ! Scot. Cr. Fl. t. 105.

*Hab.* Z<sub>1-2</sub> in saxis præsertim graniticis, frequens. *Les Eaux Chaudes* ; *Pierrefitte* ; *V. du Lys*, &c. In arborum cortice supra *Cauterets*.

328. *O. urnigerum*, Myrin Cor. Flor. Upsal. p. 71 ; Br. Europ. ! l. c. p. 29. t. 17 ; M. P. 260.

*Hab.* Z<sub>1</sub> in arboribus et saxis graniticis prope *Pierrefitte* et *Cauterets*, socio *Leskea nervosa* : rarissime.

329. *O. Sturmii*, H. et H. Bot. Zeit. 1819, p. 89 ; Br. Europ. l. c. p. 9. t. 2.

*Hab.* P. or. *St. Martin du Canigou* et in convalle d'*Eynes* (Montagne, l. c.).

330. *O. cupulatum*, Hoffm. Deutsch. Flor. 2. p. 26 ; Br. Europ. l. c. t. 2 ; M. P. 261.

*Hab.* Z<sub>1</sub> in saxis calcareis, haud vulgatum. *Les Eaux Bonnes*, &c.

331. *O. obtusifolium*, Schrad. Crypt. Germ. p. 14; Br. Europ. l. c. p. 13. t. 1; M. P. 262.

*Hab.*  $Z_1$  inf. P. occ. et c. circa Pau et B.-de-Bigorre in populorum truncis.

Tribus 27. ENCALYPTEÆ, Bryol. Europ.

62. *Encalypta*, Schreber.

332. *E. streptocarpa*, Hedw. Sp. Musc. t. 10; Br. Europ. fasc. 4. p. 15. t. 7; M. P. 295.

*Hab.*  $Z_1$  in calce arenato murorum et ad terram calcaream in sylvis omnium Pyrenæorum, plerumque fertilis. *Forêt de Lhieris; Les Eaux Bonnes, &c.*

333. *E. rhabdocarpa*, Schwgr. Suppl. t. 17; Br. Europ. l. c. p. 13. t. 6; M. P. 296.

*Hab.*  $Z_{3-5}$  in rupibus schistosis, rarissime. P. occ. *V. de Combascou*, ut et in summo montium jugo loco *Port de Cauterets*. P. c. *Lac Lehou*.

334. *E. ciliata*, Hedw. Sp. Musc. p. 61; Br. Europ. l. c. p. 10. t. 3; M. P. 297.

*Hab.*  $Z_2$  in rupibus umbrosis, ad viarum latera, &c. passim.

335. *E. vulgaris*, Hedw. Sp. Musc. p. 60; Br. Europ. l. c. p. 9. t. 2.

Var.  $\beta$ . *gymnostoma*, Br. Europ.—*Hab.*  $Z_1$  in solo calcareo prope *Les Eaux Chaudes*, rarissime.

Var.  $\gamma$ . *mutica*, Brid. et Br. Europ.; M. P. 298.—*Hab.* ad viarum latera prope *Gavarnie*.

Var.  $\epsilon$ . Br. Europ. (= *E. pilifera*, Funk).—*Hab.* *Forêt de Transoubdt*, socio *Grimmia anodonte* (Philippe!).

336. *E. commutata*, N. et H. Br. Germ. 2. t. 15; Br. Europ. l. c. p. 8. t. 1; M. P. 299.

*Hab.*  $Z_{2-4}$  in terra denudata rupium. P. occ. *Mt. Lizé*. P. c. *Gavarnie; Lac Lehou; Lac de Séculéjo*.

337. *E. ? ligulata*, Spruce in Musci Pyr. n. 331: dense cæspitosa; caule erecto, simplici dichotomove, tenui, fragili; foliis confertis, e basi suberecta patulo-subreflexis, lineari-spatulatis, obtusis, acute carinatis, margine inferiori recurvis, nervo paulo ante apicem evanido, areolatione præter ad basin (ubi laxiori) minutissima, obscura.

*Hab.*  $Z_1$  sup. in rupibus humidis præsertim ophiticis, locis *La-bassère, Superbagnères* et *Gorge de Cauterets*.

*Planta* tota tenerrima,  $\frac{1}{4}$ –1 unc. longitudine. *Caulis* dense foliosus et inter folia radiculis propriis pallidis tenuissimis ramosis flexuosis vestitus. *Folia* lurido-rufescentia, chlorophyllo destituta, terminalibus pallido-viridibus chlorophyllosis exceptis, hic illic confertiora majora

subcomantia, e basi angusta sensim et usque ad  $\frac{4}{5}$  folii latiora, longitudine tota = 4-5 latitudinem ubi latissima, apice ipso rotundato-obtusa, *carinata, inferne complicata*, superne subexplanata; *cellulæ omnes subparallelogrammæ, parietibus crassis, inferiores magnæ* longitudine = 2 lat., *superiores 4-6ies breviores subæquilatæræ, versuum 3-4 marginalium crassiores et ex eo folia inferiora rufo-marginata, superiora pallido-marginata.*

Tribus 28. HEDWIGIACEÆ, Bryol. Europ.

63. *Hedwigia*, Ehrhart.

338. *H. imberbis*, Smith, E. Bot. t. 2237 (sub *Gymnostomo*); M. P. 263. *Hedwigidium imberbe*, Br. Europ. p. 3. t. 1.

*Hab.* Z<sub>1</sub> P. occ. ad saxa granitica prope *Laruns*. P. c. in rupibus schistosis prope *Pouzac* et *Gazos* (Philippe!).

339. *H. ciliata*, Hedw. Musc. Frond. 1. t. 40; Br. Europ. *Hedwigia*, p. 5. t. 1, 2; M. P. 264.

*Hab.* Z<sub>1-4</sub> in saxosis, ubique vulgata. "*Pic du Midi vers 2600 mètres d'altitude*" (Desmoulins).

Tribus 29. GRIMMIACEÆ, Bryol. Europ.

64. *Schistidium*, Bridel (ex parte).

340. *S. apocarpum*, L. Sp. Pl. p. 1579 (sub *Bryo*); Br. Europ. ! p. 7. t. 3, 4; M. P. 265.

*Hab.* Z<sub>0-5</sub> in saxis, passim.

341. *S. confertum*, Funk, Moos-Tasch. t. 12 (sub *Grimmia*); Br. Europ. l. c. p. 7. t. 2. *S. apocarpum* var. *confertum*, M. P. 266.

*Hab.* Z<sub>1-5</sub> P. c. in rupibus humidiusculis graniticis et argillaceo-schistosis. *Vallée de Castelloubon. Port de Bénasque!* (Arnott!). *B.-de-Bigorre* et *Labassère* (Philippe!).

†*S. ? recurvifolium*, Wils. in litt. ad R. S.

*Hab.* Z<sub>1</sub> sup. P. occ. in rupibus argillaceo-schistosis vallis d' *Ossau* supra *Béost*, sterile.

This moss has been found in a barren state in several parts of England. It approaches very closely to *S. apocarpum*, yet it may be a *Tortula* or a *Didymodon*.

65. *Coscinodon*, Sprengel.

342. *C. cribrusus*, Hedw. Musc. Frond. 3. t. 31 (sub *Grimmia*); M. P. 267. *Coscinodon pulvinatus*, Spreng.; Br. Europ. *Coscinodon* (cum ic.).

*Hab.* Z<sub>1-2</sub> P. occ. in rupibus schistaceis prope *Pierrefitte*. P. c. locis similibus vallis *Castelloubon* loco *les Scieries de Gazos*, etiam in mortario murorum ad pagum *Asté*, ubi am. Philippe detexit. P. or. locis *Bellegarde* et *Concampa* (Arnott!).



“Folia nonnunquam *trinervia*, i. e. plicis lateralibus e strato duplici cellularum constitutis.” M. P. *l. c.*

On the mountain (*Superbagnères*) which rises at the back of the town of *Bagnères-de-Luchon*, I gathered a *Coscinodon*, which differs considerably in the foliage from my specimens of *C. cribrus*, but the fruit is too immature to afford any character. The leaves are smaller, *erect at the base, then widely spreading, and finally incurved at the summit*, strongly keeled, but quite destitute of plicæ: those of the perichætium remarkably large, three times the length of the stem-leaves.

#### 66. *Grimmia*, Ehrhart.

*Obs.* The species of this genus are in the Pyrenees perhaps more conspicuous than those of any other. *G. orbicularis* and *crinita* were observed only on calcareous formations, and the latter only on mortar in walls: both in exposed sunny situations\*, not rising to the region of coniferous trees. *G. sulcata* was noticed only on argillaceous schist. The only species which never descend into the woody region are *G. sulcata* and *atrata*. The following species are subalpine or alpine: *G. patens*, *elatior*, *funalis*, *spiralis*, *incurva*, *Doniana*, *alpestris* and *ovata*; but nearly all of these are occasionally seen below the coniferous region, or towards the upper limit of  $Z_1$ . The following species are characteristic of the lower mountains, namely *G. leucophæa* on granite or schist, and *G. orbicularis* on limestone. The region of coniferous trees ( $Z_2$ ,  $Z_3$ ) is marked by the frequent occurrence of *G. ovata*, *commutata* and *elatior*. The essentially alpine species (above-mentioned) are too sparingly distributed to impart any peculiarity to the vegetation.

343. *G. anodon*, Br. Europ. *Grimmia*, p. 8. t. 1.

*Hab.*  $Z_2$  P. c. *V. du Lys* in saxis graniticis; in rupibus micaeo-schistosis sylvæ *Transoubât* supra *Oubât* (Philippe!).

344. *G. crinita*, Brid. Mant. p. 32; Br. Europ. ! *l. c.* p. 10. t. 2; M. P. 268.

*Hab.*  $Z_{0-1}$  P. occ. in muris prope *Pau*. P. c. ad casarum muros in pago *Pouzac* prope *B.-de-Bigorre*! (Philippe!).

Specimens communicated by Dr. Arnott from Montpellier have the perichætial leaves alone piliferous, even the terminal ones of the sterile branches being mucous. In this character it precisely agrees with *G. plagiopodia*, Hedw.; yet the calyptra is dimidiate, not mitriform as in that species.

345. *G. pulvinata*, L. Sp. Pl. p. 1586 (sub *Bryo*); Br. Europ. *l. c.* p. 12. t. 4; M. P. 269.

*Hab.*  $Z_{0-1}$  in muris rupibusque umbrosioribus.

346. *G. orbicularis*, B. et S. ! Br. Europ. *l. c.* p. 13. t. 5; Wil-

\* In the Eastern Pyrenees, Dr. Arnott observed walls covered on the south side with *G. orbicularis*, and on the north side with *G. pulvinata*.

son ! in E. Bot. Suppl. t. 2888 ; M. P. 270. *G. africana*, Arnott ! Disp. Meth. p. 21 ; Duby, Bot. Gall. p. 574.

*Hab.* Z<sub>0-1</sub> in muris rupibusque calcareis apricis circa Pau et B.-de-Bigorre. *Pyrénées Orientales* (Arnott !). Circa Burdigalam (Grateloup !).

347. *G. spiralis*, H. et T. in Drumm. Musc. Scot. v. 2. n. 29; Grev. ! Scot. Cr. Fl. t. 203 ; Br. Europ. l. c. p. 14. t. 7 ; M. P. 271.

*Hab.* Z<sub>2-4</sub> P. occ. in saxis graniticis circa *Cauterets*, locis *Mt. Lizé*, *Source de la Raillère* et *Lac de Gaube*, pulcherrime ! P. c. *Lac Lehou* (Philippe !). P. or. *V. d'Eynes* (Arnott !).

348. *G. torta*, H. et Nees, Br. Germ. 2. t. 22. *G. torquata*, Hook. ; Grev. ! Scot. Cr. Fl. t. 199. *G. spiralis* var. *torta*, M. P. 272.

*Hab.* Z<sub>2-3</sub> in rupibus udiusculis. P. occ. secus rivuli *Gave de Marcadaou* ripas, socio *Zygodonte Mougeotii*. P. c. *Lac de Séculéjo*.

*Zygodon* species vult cel. Schimper.

349. *G. incurva*, Schwgr. Suppl. 1. § 1. p. 9 ; § 2. t. 97. "*G. trichophylla*," M. P. 273.

*Hab.* Z<sub>1-2</sub> P. occ. in saxis graniticis vallis *Combascou*, ut et prope *Pierrefitte*.

350. *G. trichophylla*, Grev. Scot. Cr. Fl. t. 100 ; Br. Europ. *Grimmia*, p. 16. t. 9.

*Hab.* P. or. ad *St. Antoine de Galamus* in montibus *Corbariis* (Montagne, l. c.).

351. *G. funalis*, Schwgr. Suppl. 1. § 1. p. 150. t. 37 (sub *Trichostomo*) ; Br. Europ. *Grimmia*, p. 17. t. 11.

*Hab.* Z<sub>1 sup.</sub> P. c. in rupibus argillaceo-schistosis, locis *Labasère* et *V. de Castelloubon*.

352. *G. elatior*, B. et S. ! Br. Europ. l. c. p. 17. t. 10 ; M. P. 274.

*Hab.* Z<sub>2-3</sub> in saxis graniticis secus rivulos Pyrenæorum totorum, sed nusquam copiosa. *Cauterets*. *Penticosa*. *Ruisseau d'Ardalos*, &c. *Mont Louis* et *Seo d'Urgel* (Arnott !). In summo monte *Canigou* (Montagne !).

353. *G. patens*, Dicks. Crypt. fasc. 2. p. 6 (sub *Bryo*) ; Br. Europ. l. c. p. 18. t. 10 bis.

*Hab.* Z<sub>2-4</sub> ad rupes madidas regionum sylvaticarum alpinarumque. *Pont d'Espagne*. *Port de Cauterets*, &c.

354. *G. commutata*, Hueben. Musc. Germ. p. 185 ; Br. Europ. l. c. p. 25. t. 19 ; M. P. 276. *Dicranum ovale*, Hedw. Sp. Musc. p. 140.

*Hab.*  $Z_{2-3}$  in rupibus graniticis secus rivulos. *Gave d'Ossau*. *Pont d'Espagne*. *Penticosa*. *Mont Louis* (Arnott!).

355. *G. leucophæa*, Grev. ! Act. Soc. Wern. 4. t. 6; Br. Europ. *l. c.* p. 23. t. 20; M. P. 277.

*Hab.*  $Z_1$  in saxis graniticis schistosisque montium humiliorum, frequens. *Cauterets*. *B.-de-Bigorre*. *Séo d'Urgel* (Arnott!). In tepidariis *Vernet les bains* (Montagne!).

356. *G. ovata*, W. et M. Iter Suec. t. 2; Br. Europ. ! *l. c.* p. 21. t. 17; M. P. 278.

*Hab.*  $Z_{1\text{ sup.}-3}$  in saxis graniticis Pyrenæorum totorum sylvaticorum.

Var.  $\delta$ . *cylindrica*, Br. Europ. *l. c.* t. 18; M. P. 279. *G. cylindrica*, Br. Germ. *Hab.* ad lacus Séculéjo ripas.

357. *G. Doniana*, Smith, Fl. Brit. p. 1198; H. et T. ! Musc. Brit. p. 72. t. 13; M. P. 280. *G. obtusa*, Schwgr.; Br. Europ. *l. c.* p. 20. t. 13.

*Hab.*  $Z_{2-3}$  P. c. in saxis graniticis vallis *Castelloubon*, loco *les Scieries de Gazos*; *Vallon du Peyrosse* (Philippe!); *Mt. Maladetta* (DeC. in Fl. Française).

Var. *curvula*, M. P. 281. *Grimmia curvula*, Br. Europ. *l. c.* p. 11. t. 3. *Hab.* *V. de Castelloubon*, cum forma normali; *Gorge de Labassère*; *Port de Bénasque* (Arnott!).

"Pedicellus in statu etiam normali *curvulus* est;" M. P. *l. c.*

358. *G. alpestris*, Schleich. Pl. exsic. Helvet.; Br. Europ. ! *l. c.* p. 27. t. 15; M. P. 282.

*Hab.*  $Z_3$  P. occ. circa *Cauterets*, in saxis graniticis ad marginem lacus *Lac de Gaube* dicti, etiam in monte *Lizé* et secus ripas *Gave de Marcadaou*. P. c. *derrière le Pic Montaigu à côté de Gazos* (Philippe!). P. or. *Mt. Canigou* (Arnott!).

359. *G. sulcata*, Sauter, Br. Europ. ! *l. c.* p. 27. t. 16; M. P. 283.

*Hab.*  $Z_4$  in rupibus udis argillaceo-schistosis loco *Port de Bénasque*. In summis Pyrenæis sine loco designato (Endress in Br. Europ.).

*Folia* in parte superiore e serie duplici triplicive cellularum constituta.

360. *G. atrata*, Mielich. Bot. Zeit. 1819, p. 85; Br. Europ. ! *l. c.* p. 30. t. 24; M. P. 284.

*Hab.*  $Z_4$  P. c. in rupium schistosarum fissuris ad marginem lacus dict. *Lac Lehou*; *Pic de la Peyre* (Philippe!); *Port de Bénasque* (Arnott!). P. or. *Pic de Crabère* (Arnott!).

67. *Racomitrium*, Bridel.

361. *R. fasciculare*, Schrad. Spicil. Fl. Germ. p. 61 (sub *Trichostomo*); Br. Europ. *Racomitrium*, p. 8. t. 4; M. P. 285.

*Hab.*  $Z_{2-3}$  in rupibus udis regionis arborum conifer., frequens. *Pont d'Espagne*. *V. de Lesponne*, &c.

362. *R. lanuginosum*, Hedw. Musc. Frond. 3. p. 3. t. 2 (sub *Trichostomo*); Br. Europ. *l. c.* p. 11. t. 6.

*Hab.*  $Z_{1-2}$  per Pyrenæos, fere semper sterile, fertile tamen juxta les *Eaux Bonnes* legit am. Southby.

According to the 'Bryologia Europæa' this species is never fertile in the plains, but in England I have gathered well-fruited specimens on moors in the vale of York, at an elevation of not more than 50 feet above the sea.

363. *R. canescens*, Hedw. Musc. Frond. 3. t. 3 (sub *Trichostomo*); Br. Europ. *l. c.* p. 12. t. 7; M. P. 286.

*Hab.*  $Z_{1-2}$  in sylvis terrestre et rupestre, haud raro fertile.

364. *R. sudeticum*, Funk. Crypt. n. 670 (sub *Trichost.*); Br. Europ. ! *l. c.* p. 7. t. 1; M. P. 287. *Trichostomum microcarpon*, Hedw.; H. et T. ! Musc. Brit. p. 107. t. 19.

*Hab.*  $Z_{2-4}$  in rupibus graniticis schistosisque humidiusculis. *P. c. V. de Castelloubon*; *Ruisseau d'Ardalos*; *Route du Lac Lehou* (Dufour !); *Base du Pic du Midi* (Philippe !). *P. or. Cambrédazes* (Arnott !).

Var. minus, habitu *Grimmiæ ovatæ*; foliis plerumque muticis; *dentibus peristomii* 16 *subintegrè bifidisve*, nunquam usque ad basin partitis. *Hab.* in loco alpino *Port de Bénasque* dicto.

The teeth of the peristome are united at the base into a membrane rising above the mouth of the capsule, by which this variety is distinguished from *Grimmia ovata*. The basal cellules of the leaf have three or four marked indentations on each side, and the margins are slightly incrassated upwards.

365. *R. heterostichum*, Hedw. Musc. Frond. 2. t. 25 (sub *Trichostomo*); Br. Europ. *l. c.* p. 9. t. 2 *bis* et 3; M. P. 288.

*Hab.*  $Z_{1 \text{ sup.}-3}$  in saxis rupibusque, vulgatissimum.

366. *R. protensum*, Al. Braun; Br. Europ. *l. c.* p. 6, t. *Drypt.* 2; M. P. 289. *Dicranum aciculare*  $\gamma$ , Turn. ! Musc. Hibern. p. 67.

*Hab.*  $Z_2$  in rupibus udis secus rivulos. *P. occ. Mte. Verte.* *P. c. Labassère*; *V. de Castelloubon*; *Forêt de Transoubât*.

367. *R. aciculare*, Hedw. Musc. Frond. 3. t. 33 (sub *Dicrano*); Br. Europ. *l. c.* p. 6, t. *Drypt.* 1; M. P. 290.

*Hab.*  $Z_2$  in saxis rivulorum, frequens.

Tribus 30. RIPARIACEÆ, Bryol. Europ.

68. *Cinclidotus*, Pal. Beauv.

368. *C. riparius*, W. et M. Bot. T. p. 120 (sub *Trichostomo*); Br. Europ. ! *Cinclidotus*, p. 10. t. 2; M. P. 291.

*Hab.*  $Z_{1-2}$  P. occ. et c. (*forma typica*) in rivulo *Gave d'Ossau* dicto prope *Gabas*.

Var.  $\beta$ . *terrestris*, Br. Europ. ! *l. c.* p. 11. t. 2; M. P. 292.—*Hab.* ad saxa arborumque radices prope *Narcastet* et *Jurançon*. *Montgaillard*, secus ripas fl. *Adour* (Philippe!).

369. *C. fontinaloides*, Hedw. Musc. Frond. 3. t. 14 (sub *Trichostomo*); Br. Europ. *l. c.* p. . t. 3; M. P. 293.

*Hab.*  $Z_{1-2}$  in saxis demersis rivulorum.

370. *C. aquaticus*, Hedw. Musc. Frond. 3. t. 11 (sub *Hedwigia*); Br. Europ. ! *l. c.* p. 8. t. 1; M. P. 294.

*Hab.*  $Z_1$  P. c. prope *B.-de-Bigorre*, in flum. *Adour* ut et in rivulo juxta monasterium *Médous*, saxis demersis adhærens: planta ♂ sola. *Rivière du Hérault*, *Vauchuse* (Arnott!).

Tribus 31. FONTINALEÆ, Bryol. Europ.

69. *Fontinalis*, Dillenius, Linnæus.

371. *F. antipyretica*, L. Sp. Pl. p. 1571; Br. Europ. *Fontinalis*, t. 2.

*Hab.*  $Z_1$  in aquis fluentibus Pyrenæorum, haud vulgaris. P. occ. prope *les Eaux Bonnes* (Dufour!) etiam juxta pagum *Bétharam* pulchre fructiferum (Grateloup!).

Tribus 32. FISSIDENTEÆ, Bryol. Europ.

70. *Fissidens*, Hedwig.

372. *F. grandifrons*, Brid. Suppl. Musc. 1. p. 170 (1806); Br. Europ. fasc. 17, *Fissidens*, p. 11. t. 6; M. P. 311. *Dicranum adiantoides*  $\beta$ . *atrovirens*, DeCand. Fl. Fr. *D. palmiforme*, Ramond, Pyr. ined. (1815).

*Hab.*  $Z_1$  per totos Pyrenæos in rupibus tophaceis irroratis, præcipue secus cataractas: semper sterilem vidi. Prope *B.-de-Bigorre*, in vallecula *Elysée Cottin* dicta, floribus masculis detexerunt Philippe et R. S.

*Flores masculi* medio caule positi, in foliorum duplicatura nidulantes, raro proxime sequentes foliis caulinis autem 2–3 inanibus inter singula folia florigera, iis *F. adiantoidis* similes, 5–8-phylli. *Folia floralia* propria 2–3, ovata, concava, dorso haud alata apice tamen laminula parva (=  $\frac{1}{4}$  folii) instructa. *Antheridia* 4–9, oblongo-cylindrica, paraphysibus destituta.

373. *F. adiantoides*, L. Sp. Pl. p. 1588 (sub *Hypno*); Br. Europ. *l. c.* p. 10. t. 5; M. P. 312.

*Hab.*  $Z_{1-3}$  in scaturiginosis pratisque humidis, frequens.

374. *F. taxifolius*, L. Sp. Pl. p. 1587 (sub *Hypno*); Br. Europ. *l. c.* p. 9. t. 4; M. P. 313.

*Hab.*  $Z_{0-1}$  in sylvaticis, terrestribus.

375. *F. osmundioides*, Hedw. Sp. Musc. t. 40; Br. Europ. *l. c.* p. 8. t. 3; M. P. 314.

*Hab.*  $Z_2$  P. c. in saxis irroratis cataractæ dict. *Cascade du Cœur*.

376. *F. incurvus*, Schwgr. Suppl. t. 49; Br. Europ. ! *l. c.* p. 6. t. 1; M. P. 315.

*Hab.*  $Z_{1\text{ inf}}$  P. c. in terra arenosa. P. occ. prope *Gélos*. P. c. prope *B.-de-Bigorre*.

Along with the usual state of the species at *Gélos* grows a delicate form which I am undecided whether or not to regard as a distinct species. It has the calyptra conico-subulate, *quite entire, barely sheathing the operculum*. The antheridia are enclosed in a bud springing from the base of the stem, precisely as in *F. taxifolius*: I have not seen one terminating a branch, as in *F. incurvus*.

377. *F. fontanus*, Schimper; M. P. 316. *F. incurvus* var. *fontanus*, Br. Europ. *l. c.* t. 1. f.  $\beta$ . 1.

*Hab.*  $Z_1$  ad saxa emersa rivuli *Adour de Lesponne* prope *B.-de-Bigorre*.

378. *F. bryoides*, Hedw. Musc. Frond. 3. t. 29; Br. Europ. *l. c.* t. 2; M. P. 317.

*Hab.*  $Z_{0-1}$  ad terram arenosam et argillaceo-arenosam.

"Var. *rivularis*, foliis 12–20 jugis, *elongatis, limbo valde incrassato circumductis*, capsula plerumque horizontali;" M. P. 318.—

*Hab.* *B.-de-Bigorre* in lapidibus rivuli supra fontem *la fontaine ferrugineuse* dictum.—An species propria? (*F. Pyrenaicus*, mst.)

#### 71. *Conomitrium*, Montagne.

379. *C. Julianum*, Savi, Poll. Fl. Veron. 3. p. 385 (sub *Fontinali*); Mont. in Ann. des Sc. nat. tom. 8. p. 250. t. 4. *Octodicerus Julianum*, Brid. Br. Univ. 2. p. 678; Br. Europ. fasc. 17 (cum icone).

*Hab.*  $Z_0$  P. occ. *Dax*, in fontibus tepidis (Dufour! Grateloup!).

#### Tribus 33. LEUCOBRYACEÆ, C. Muell. Syn. Musc.

##### 72. *Leucobryum*, Hampe in Linnæa, 13. p. 42.

380. *L. glaucum*, L. Sp. Pl. p. 1582 (sub *Bryo*); C. M. Syn. Musc. p. 74. *Dicranum glaucum*, Hedw.; Schwgr. Suppl. t. 48; M. P. 204.

*Hab.*  $Z_{0-1}$  in sylvis Pyrenæorum humiliorum ut et Agri *Ann. & Mag. N. Hist.* Ser. 2. Vol. iii. 32

*Syrtici, truncos Castanearum decurtatarum cariosos pulcherrime vestiens.*

Nothing can exceed the beauty of this moss when in a state of luxuriant fructification, as it is seen in the forests at the foot of the French Pyrenees. There it spreads over fallen timber and the decaying trunks of polled chestnut-trees, and the rich brown capsules, each half-enveloped in its silvery calyptra, stud its swelling and snowy tufts as with so many gems. The structure of its leaves is very remarkable and appears not to have been well understood by bryologists. I consider the leaves to be as *truly nerved* as those of *Dicranum longifolium*, *Campylopus fragilis*, e. a., where the existence of a nerve is now generally admitted. The nerve, in fact, occupies nearly the whole of the leaf, with the exception of a narrow limb on each side, of one cellule in thickness and 10 or 12 cellules in breadth near the base, which disappears about half-way up the leaf, or a little beyond where the margins begin to be strongly inflexed: this is quite analogous to what is observed in the species just referred to. [See PLATE I., where figures 1 and 2 represent transverse sections of the leaf, the former made near the apex and the latter near the base; *a b* the nerve, *a a* and *b b* the limb on each side: magnified about 240 times.] The nerve consists of only two layers of cellules, towards the apex, and on the axis down to the very base; but in its lower half one or two additional layers are imposed on both the upper and under surfaces, the greatest thickness being about midway between the axis and the limb on each side (fig. 2), in consequence of which the leaf is usually somewhat channeled on the back towards the base. The cellules composing the nerve are elongated prisms, quadrangular on the longitudinal and 5-7-gonal on the transverse section. Their *internal* walls exhibit large circular perforations (see figs.), one in each end and 1-3 in each side of every cellule. I have been unable to detect any openings whatever in the *external* walls of those cellules which constitute the upper and under surfaces of the nerve; the foramina, which appear in great numbers on regarding a leaf with a tolerably high power, being proved, by accurately adjusting the lens, and especially by cutting various sections of the leaf, to belong, *not to the external surface*, but to the walls separating contiguous cellules; so that, while there is ample provision for a *free communication between the cellules of the nerve*, there is none whatever for their communicating with the external medium, or at least none but what exists in all cellular tissue, which is at variance with what we observe in the genus *Sphagnum*, to which *Leucobryum* is often (and not inaptly) compared, as to its mode of growth and general aspect\*. In the cellules of the limb I have been unable to detect either external or internal perforations. A transverse section is seen to be traversed by a tolerably regular medial line, which indicates the junction of the two principal layers of cellules, and is marked by

\* It is worthy of remark, that the cellules of some *Sphagna*, e. g. *S. cymbifolium*, communicate laterally with each other by means of pores in the adjacent walls.

a series of lozenge-shaped openings at the cellular angles. These openings are the sections of slender chlorophyllose cellules, running in lines from the base to the apex of the leaf, and having no communication by pores with the perforated tissue in which they are interposed. [See fig. 3, which represents part of a longitudinal section through one of these series of chlorophyllose cellules, magnified about 600 times.] These at once suggest the slender vermiform cellules similarly interposed in the prosenchymatous tissue of the *Sphagna*, of which the office is precisely the same, namely to contain the grains of chlorophyll\*.

Tribus 34. SPHAGNACEÆ, C. Mueller.

73. *Sphagnum*, Dillenius.

381. *S. acutifolium*, Ehrh. Crypt. exsicc. n. 72; Schwgr. Suppl. t. 5; M. P. 325.

*Hab.* Z<sub>2</sub> P. c. in rupibus humidis vallis *Lesponne* et secus lacum *Séculéjo*.

382. *S. cuspidatum*, Ehrh. Crypt. 251; Schwgr. Suppl. t. 6.

*Hab.* Z<sub>0</sub> P. occ. in turfosis prope *Dax* (Grateloup!).

383. *S. squarrosum*, W. et M. It. Succ. t. 2. f. 1; Schwgr. Suppl. t. 4; M. P. 326.

*Hab.* Z<sub>2-3</sub> P. occ. et c. in rupibus humidis, locis *Lesponne*, *Labassère* et *Mt. Crabioules*.

384. *S. cymbifolium*, Ehrh. Hann. Mag. 1780, p. 235; M. P.

327. *S. obtusifolium*, Ehrh.; H. et T. Musc. Brit. p. 13. t. 4.

*Hab.* Z<sub>0-1</sub> P. c. in rupibus humidis faucis *Gorge de Labassère* dictæ. P. occ. in palude turfæco montis *Goursi*. Nusquam alias in montibus Pyrenæis mihi notum! In turfosis Agri Syrtici (Grateloup!).

385. *S. compactum*, Brid. Suppl. Musc. 1. p. 18; Schwgr. Suppl. t. 3; M. P. 328.

*Hab.* Z<sub>0</sub> P. occ. in Agro Syrtico, loco *Landes de Mugriet*, copiose.

Tribus 35. ANDREÆACEÆ, C. Mueller.

74. *Andreaea*, Ehrhart.

386. *A. Rothii*, W. et M. Cr. Germ. p. 386. t. 11; Schwgr. Suppl. t. 106; M. P. 329.

*Hab.* Z<sub>2-4</sub> P. c. in rupibus graniticis juxta lacum *Séculéjo*, necnon in valle *Castelloubon*; in rupibus micaceis ad marginem lacus *Lehou* (Philippe!).

\* Since this account was drawn up, *Leucobryum glaucum* has appeared in the 'Bryologia Europæa' under the name of *Oncophorus glaucus*, and a description is given of its structure differing I believe in some slight particulars from what is here stated.



*Florescentia monoica*: flores feminei constanter trigyni; flores masculi polyandri, paraphysibus claviformibus præditi. Folia in dimidio superiori plerumque (in varietate *Grimsulana* præcipue) e seriebus cellularum duabus conflata.

M. Philippe's specimens have the terminal leaves distinctly repando-dentate, and thinner than in the ordinary form of the species.

387. *A. rupestris*, L. Sp. Pl. p. 1601 (sub *Jungermannia*); Hedw. Sp. Musc. t. 7; M. P. 330.

*Hab.* Z<sub>2-4</sub> P. c. cum priore; etiam in rupibus dict. *Chaos* prope *Gavarnie*.

*Florescentia monoica*: flores feminei di-trigyni; flores masculi tetrandri, paraphysibus carentes, nonnunquam in planta propria pseudo-alares.

## Ordo HEPATICÆ.

### Tribus 1. JUNGERMANNIÆ, Nees ab E.

#### Hemicyclum 1. *Foliosæ*.

#### Subtribus 1. GYMNOMITRIA, N. ab E.

##### 1. *Gymnomitrium*, N. ab E.

1. *G. concinnatum*, Lightf. Fl. Scot. 2. p. 786 (sub *Jungermannia*); Gottsche, Lindbg. et Nees, Syn. Hepat. p. 3; H. P. 1.

*Hab.* Z<sub>2-4</sub> in rupibus humidis P. occ. et c., locis *Pont d'Espagne* et *Port de Bénasque*.

##### 2. *Sarcoscyphus*, Corda.

2. *S. adustus*, N. ab E. Europ. Leberm. 1. p. 120 (sub *Gymnomitrio*); Syn. Hep. p. 4.

*Hab.* Z<sub>1</sub> P. c. ad saxa in monticulo *Olivet* prope *B.-de-Bigorre*, socio *S. Funckii*.

The habit of this species, the difficulty with which it is distinguished from small forms of *S. Funckii*, and above all the structure of the perianth, demand that it should be removed to the genus *Sarcoscyphus*. I find in all cases a *true perianth* present, the origin of which is derived from the union of two leaves quite concealed by the perichætal leaves, with which it is *concrete* for nearly half its length: it is pale and of very delicate texture (cellules three times as large as those of the perichætium), erose and inflexed at the summit and sometimes 2-lipped. The perianth of *S. Funckii* is formed on the same type. In some true *Gymnomitria* (e. g. *G. concinnatum*) I observe within the perichætium two leaves (rarely only one) which are much shorter, wider and more tender than the perichætial leaves, and unequally trifid with toothed segments; but these are neither *connate* with each other nor *concrete* with the perichætium, hence they cannot be called a *perianth*, although obviously supplying the place of one. Still it would perhaps be more logical to consider *Gymnomitrium* as only a section or subgenus of *Sarcoscyphus*. I am happy

to add that Dr. Gottsche quite concurs with me in the removal of *Gymnomitrium adustum* to *Sarcoscyphus*.

3. *S. Funckii*, W. et M. Bot. p. 422 (sub *Jungermannia*); Syn. Hep. p. 8; H. P. 3.

*Hab.*  $Z_{0-1}$  locis umbrosis ad terram saxaque. P. occ. *St. Sever*; *Jurançon*; *Val de Jéret*. P. c. *Bagnères-de-Bigorre*; *Vallée du Lys*.

4. *S. emarginatus*, Ehrh. Beitr. 3. p. 80 (sub *Jungermannia*); H. P. 2; Hook. Br. Jung. t. 27. *Sarcoscyphus Ehrharti*, Syn. Hep. p. 7.

*Hab.*  $Z_{0-5}$  ad rupes humidæ Pyrenæorum totorum; ad terram in sylvis Agri Syrtici.

### 3. *Alicularia*, Corda.

*Obs.* The two European species of this genus are both found in the Pyrenees, where *A. compressa* attains its southernmost recorded limit.

5. *A. compressa*, Hook. Brit. Jung. t. 58 (sub *Jung.*); Syn. Hep. p. 12; H. P. 4.

*Hab.*  $Z_1$  P. occ. locis scaturiginosis faucibus *Gorge de Cauterets* dictæ.

6. *A. scalaris*, Schrad.; Hook. Br. Jung. t. 61 (sub *Jung.*); Syn. Hep. p. 10; H. P. 5.

*Hab.*  $Z_{0-5}$  in rupibus, ad terram, &c., a planitie usque ad summos Pyrenæos ascendens.

### 4. *Southbya*, nov. gen.\*

*Char. essent.* Perianthium terminale, involucro *emersum*, cum eodem *ab inferiori parte concretum*, primitus cylindricum dein *a lateribus subcompressum*, breviter *bilabiatum*, labiis subconniventibus, haud plicatum *suturis* tamen *duabus*, altera ventrali altera dorsali, notatum.

Genus inter *Aliculariam* et *Jungermannias integrifolias* medium locum tenens.

7. *Southbya tophacea*. (*Jungerm. tophacea* nobis in Hep. Pyren. n. 23.)

*Hab.*  $Z_{1\text{ inf}}$  in imis Pyrenæis occidentalibus, supra pagos *Jurançon* et *Gélos* in rupibus topha obiectis, cæspites *Weisia verticillatæ* marcidis haud raro vestiens; immo ad muros subhumidos in ipsa urbe *Pau*. E Lusitania sine nomine missa in herbario beati Taylor nuperius vidi.

\* To no one can I with more propriety dedicate a new genus of Pyrenean Cryptogamia than to Dr. Southby, my companion in so many interesting excursions in those mountains, and a gentleman accomplished in almost every branch of natural history.

*Plantæ* pusillæ, tenerrimæ,  $\frac{1}{4}$ — $\frac{3}{4}$  unc. longæ, cæspitosæ, matrice arcte adfixæ, instar *Jg. bicrenatæ* suaveolentes. Caulis simplex, rarius furcatus, e perianthii basi innovationes 1 vel 2 ante capsulæ maturationem involucri inclusas semper proferens, prostrata, apice fertili tamen assurgens, longis radiculis pallidis radicans. *Folia* pallide viridia, *inferiora* semiverticaliter affixa, subopposita, angulis dorsalibus subcontiguis nonnunquam connatis, reflexo-patula, ovata vel ovali-oblonga, apice rotundata, integerrima; *superiora* verticalia, plerumque conferta, *basi dorsali per paria conjuncta*, apice margineque ventrali solis reflexa, raro apice retusa, obtuse emarginata vel angulato-repanda; *involucralia* caulinis superioribus simillima, paulo majora, apice eroso-denticulata, cum perianthio ad basin concreta. *Amphigastrium* involucrale, ovato-lanceolatum, obtusum, nonnunquam adest; cæterum caulis omnino examphigastriata est. *Perianthium* terminale involucri subæquans (in plantis minoribus densifoliis nonnunquam involucri vix æquat, in elatioribus autem sparsifoliis involucri plus minus superat), e foliis duobus plus minus alte connatis conflatum et ex eo compressum bilabiatumque, labiis subconniventibus, post capsulæ emissionem haud raro collapsis, ore tametsi apertum, eroso-denticulatum rarius subincisum. *Textura* foliorum et perianthii est laxa, subpellucens, e cellulis majoribus in reti typice sexangularibus, limitibus angustis, intercalaribus nullis, granis chlorophyllicis magnis haud numerosis. *Calyptra* obovata, pallida, membranacea. *Capsula* fusca, subglobosa, tenera, laxè areolata, ad basin usque 4-valva aut, valvula una alterave bifida, 5–6-valva, pedicello pallido exserta. *Semina* grandiuscula, globosa, granulosa. *Elateres* torti, bispiri, apicibus subobtusis.

*Florescentia* dioica videtur. *Plantæ mascule* foemineis tenuiores, tota fere longitudine staminifera. *Folia perigonalia* minora, semper per paria connata, basi ventricosa, apice patula, stamina singula binave brevi-pedicellata circumscissim rumpentia in axillis foveantia.

TAB. III. Fig. 1, *plantæ nat. magn.*; fig. 2, *surculus sterilis a dorso visus*; fig. 3, *planta fertilis a latere visa*; fig. 4, *apex plantæ masc.*; fig. 5, *folia inferiora*; fig. 6, *folia superiora*; fig. 7, *apex folii*; fig. 8, *perianthium cum involucri a dorso visum*; fig. 9, *perianthium (effæctum et collapsum) a latere, cum folio involucrali arcte retroflexo: omnia aucta.*

*Obs.* A first glance at this pretty species reminds one of *Alicularia scalaris*, but important differences are disclosed on a nearer examination; still, an extensive comparison of apparently cognate forms has convinced me that the *Aliculariæ* are in truth its closest allies. If a perianth of *Southbya* and one of *Alicularia scalaris* be vertically divided, and laid side by side, the relationship will be clearly obvious: the involucre is alike in both, and in both is it concrete below with the perianth, which also is formed on the same type in each. Could we now suppose the perianth of *A. scalaris* to be a little elongated, or that of *Southbya* to be a little abbreviated, the sole important difference would vanish. In reality, small forms of *Southbya* have the perianth sometimes barely visible beyond the involucre.

There is also a section of *Jungermannia*, consisting entirely of exotic species, which approaches *Southbya*, though more remotely. The type of this section is *Jg. turgescens*, Tayl. et Hook. fil. in Crypt. Antarctica, p. 38, t. 64, which has the *perianth slightly compressed laterally and truncate, but quite discrete from the involucre*. The habit too is widely different, the *stems being much divided, scarcely radiculose, the leaves very concave, with a minute guttulate areolation* (the cellules round, separated by wide interstices), and there are *bifid stipules* present. *Alicularia strongylophylla*, Eorund. l. c. p. 34, t. 62, has the *perianth exactly as in Jg. turgescens*, quite free and sometimes *twice as long as the involucre*; the chief differences being the *less concave leaves* and the wider areolation (yet still equally guttulate): *it is therefore not an Alicularia*, and with *Jg. turgescens* might well constitute a new genus, of which other species are probably *Jg. æquata* and *humilis* of the same authors. Possibly their *Alicularia occlusa* and the *Jungermannia Liebmanniana* of Lindenberg and Gottsche may go into the same genus, but of these I have not seen specimens. These species seem all intermediate between *Southbya* and the true *Jungermanniæ*, which they approach through *Jg. Taylora* and its allies.

On another side, *Southbya* has some affinity with a small group, of which *Jungermannia hyalina* is the European representative; but these differ from it in the *red radicles*, and in the *perianth being contracted and numerously plicate towards the mouth*.

[To be continued.]

---

**XLIX. *Algæ Orientales* :—Descriptions of new Species belonging to the genus Sargassum. By R. K. GREVILLE, LL.D. &c.\***

[Continued from p. 257.]

[With a Plate.]

At the moment when I have brought these descriptions of *Sargassa* to a close, I have learned that the first volume of the 'Genera et Species Algarum' by the younger Agardh, has appeared. This I was, of course, unprepared for, having never, in fact, even seen the work advertised. I would gladly have deferred bringing forward my present series of papers until I could have had the benefit of consulting that work, but it is now too late, and some confusion in nomenclature will be the probable result. It will be remembered that in commencing these descriptions I stated, that with few exceptions the subjects had been transmitted to me by my friend Dr. Wight for publication in the second volume of the 'Prod. Fl. Ind. Orientalis,' and that the interruption which had occurred in the continuation of that undertaking had induced me, after retaining my notes and drawings for many years,

\* Read before the Botanical Society of Edinburgh, April 12, 1849.