

A Contribution to the Freshwater Algæ of West Ireland.

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(PLATES XVIII.—XXIV.)

DURING the July of 1890 I went to the West of Ireland and made some hundreds of gatherings of Algæ from this most prolific district. The localities were varied as much as possible considering the limited time that I had, yet there was a lack of material from the more elevated parts of the district, on account of the unfavourable weather which prevailed preventing any ascent of the higher mountains. Notwithstanding this slight drawback, the collections have proved to be extremely rich in species, some of those which are usually considered rare proving to be locally common, while a number of species and varieties are entirely new.

A few good gatherings were made in and near lakes both north and south of Westport. The small lakes and moor-pools of South-west Mayo towards Leenane, as well as those of Galway towards Clifden, were also found to be rich localities; but the best-yielding district was undoubtedly that traversed between Clifden and Roundstone, and thence through Connemara by way of Ballynahinch and Glendalough to Oughterard, the land here being studded with innumerable small lakes. A walk from Ballyvaughan over the terraced limestone hills of Burren in N. Clare to Gort yielded hardly any Algæ. A few days spent in the neighbourhood of Muckross proved that district to be well worth investigating. These were the only places in which I collected, except that one small bottle was filled from the river at Mallow while waiting for a train.

In the August of 1891 I again went to the S.W. of Ireland; although the weather was most unfavourable, the rain seldom ceasing, still a very large number of gatherings were made. Many species were obtained from pools and other places near the Lower Lake of Killarney and O'Sullivan's Cascade. Some excellent gatherings were made on Carrantuohill, especially to the S.E. and W. of the summit, and between it and Glen Caragh. Between Glen Caragh and Glengarriff, going past Lough Brin and through

Kenmare, some good species were collected. Perhaps the best gatherings, however, were made during a walk down Bantry Bay, past the foot of Sugar Loaf mountain, through Adrigole, past the base of Hungry Hill to Castletown, and from small lakes near the coast S.W. of the latter locality. In returning to Kenmare a brief stay was made at Cloonee Lough in driving rain, which resulted in the collection of some interesting species.

Washings and squeezings from submerged plants such as the following were found to yield many of the smaller species:—*Nymphæa*, *Nuphar*, *Myriophyllum*, *Ceratophyllum*, *Utricularia*, *Eriocaulon*, *Lobelia*, *Callitriche*, *Scirpus fluitans*, *Chara*, *Nitella*, *Sphagnum subsecundum* var. *contortum*, *S. cuspidatum* var. *plumosum*, *Hypnum scorpioides*, *H. exannulatum*, *Rhynchostegium ruscifolium*, *Scapania resupinata*, *Dumortiera irrigua*, and *Aneura multifida*.

I am greatly indebted to my son G. S. West (National Scholar in Biology), who has assisted me most ably in preparing this paper, for without his valuable help its appearance would certainly have been considerably delayed. I have also to thank him for his careful work in the execution of the Plates. My son Wm. West has also rendered considerable help in the literary work of this paper.

As the collections were practically all made in two distinctly separate districts of the W. of Ireland, the prefixed Roman numerals I. and II. are here used to denote the Northern (Galway and Mayo) and Southern (Kerry and Cork) districts respectively.

One dagger (†) prefixed to a species indicates that it is new to the British Isles as far as I can ascertain; two daggers (††) indicate that it is hitherto undescribed. Asterisks denote subspecies.

Although the list is very extensive and has entailed a great amount of work, I do not consider the material to be exhausted.

A very interesting feature of these gatherings has been the refinding of a large number of the species previously found by Archer, many of which are from other districts.

Summary of Species, Varieties, and Forms observed.

Genera.	No. of species.	No. of subspecies.	No. of varieties.	No. of forms.
Batrachospermum	2			
Coleochæte	2			
Bulbochæte	3			
Edogonium	13	.....	2	1
Conferva	4	.....	1	
Cladophora	1			
Draparnaldia	1	.....	1	
Chatophora	1			
Aphanochæte	2			
Prasiola	1			
Hormiscia	1			
Ulothrix.....	1			
Trentepohlia.....	1			
Mougeotia	4			
Spirogyra	5			
Zygnema	3	.....	.....	2
Gonatozygon	5			
Sphærozozma	4			
Spondylosium	4			
Onychonema	1			
Hyalotheca	3	.....	1	1
Gymnozyga	1			
Desmidiium	3			
Docidium	2	.....	1	
Pleurotænium	7	.....	4	
Closterium.....	37	.....	2	2
Penium	19	.....	9	5
Cylindrocystis	3	1		
Mesotænium	3	.....	1	
Tetmemorus	3	.....	2	1
Spirotænia.....	3			
Micrasterias	13	.....	2	5
Euastrum	26	1	7	2
Cosmarium	108	2	19	9
Xanthidium	9	.....	5	1
Arthrodesmus	10	.....	3	1
Staurastrum	81	2	22	4
Eudorina	1			
Pandorina	1			
Gonium	1			
Pediastrum	7	.....	1	
Selenastrum	1			
Sorastrum	1			
Staurogenia	2			
Cœlastrum	5			
Sciadium	1			
Ophioeytium	1			
Dictyosphærium	1			
Apicystis	1			
Hydrianum	1			
Nephroeytium	2			

Table (continued).

Genera.	No. of species.	No. of subspecies.	No. of varieties.	No. of forms.
Oocystis	3			
Porphyridium	1			
Pleurococcus	2			
Acanthococcus	2			
Chlorococcum	2	.....	1	
Glæocystis.....	4			
Eremosphæra	1			
Botryococcus.....	2			
Urococcus	1			
Rhaphidium	1	.....	1	
Scenedesmus	6	.....	4	
Polyedrium	5			
Nostoc	1			
Cylindrospermum.....	1			
Anabæna	2			
Calothrix	1			
Rivularia	3			
Tolypothrix	2			
Petalonema	1			
Scytonema	2			
Stigonema	2			
Oscillaria	7			
Microcoleus	1			
Lyngbya	1			
Spirulina	2			
Chroococcus	2			
Glæocapsa.....	3			
Synechococcus	1			
Merismopedia	4			
Tetrapedia.....	1			
Aphanocapsa	1	.....	1	
Glæocystis	1			
Microcystis	2			
Aphanothece	1			
Coslospharium	1			
Cyclotella	2			
Melosira.....	2			
Surirella	7	.....	1	
Cymatopleura	2			
Epithemia.....	7			
Eunotia	11	.....	1	
Ceratoneis	1			
Cymbella	4			
Cocconema	4			
Encyonema	2			
Amphora	1			
Cocconeis	3			
Achnanthidium.....	2			
Achnanthes	2			
Odontidium	3			
Fragilaria	1			
Diatoma	2			

Table (continued).

Genera.	No. of species.	No. of subspecies.	No. of varieties.	No. of forms.
Synedra	8	.....	1	
Asterionella	1			
Amphipleura	1			
Nitzschia	8			
Nitzschiella	1			
Navicula	18	.....	1	2
Pinnularia	15	.....	2	
Frustulia	1			
Pleurosigma	1			
Stauroneis	3	.....	.....	1
Pleurostaurum	1			
Mastogloia	1			
Gomphonema	9	.....	1	
Meridion	2			
Tabellaria	2			
Total	617	6	97	37

The above total number consists of 345 species, 6 subspecies, 78 varieties, and 31 forms of Desmidiaceæ belonging to 21 genera; 128 species, 7 varieties, and 3 forms of Diatomaceæ belonging to 32 genera; the remaining 144 species, 12 varieties, and 3 forms are distributed over 65 genera.

34 species, 7 subspecies, 47 varieties, and 28 forms are here described for the first time.

I. ALGÆ.

Class FLORIDEÆ.

Ord. HELMINTHOCLADIÆ.

1. *BATRACHOSPERMUM MONILIFORME*, Roth. (*Rabh. Fl. Europ. Alg.* iii. p. 405.)

II. Glen Caragh; Mallow.

2. *B. VAGUM*, Ag. (*Rabh. l. c.* p. 406.)

I. Ballynahinch.—II. Tore Mt.

Class CONFERVOIDÆ HETEROGAMEÆ.

Ord. COLEOCHÆTACEÆ.

1. *COLEOCHETE SCUTATA*, Bréb. (*Rabh. Fl. Europ. Alg.* iii p. 390.)

I. Lakes, Clifden to Roundstone, and near Recess.

†2. COLEOCHÆTE IRREGULARIS, *Prings.* (*Rabh. Fl. Europ. Alg.* p. 390.)

Diam. cell. veget. 12·5–20 μ .

I. Lough Creggan; Roundstone.

Ord. CÉDOGONIACEÆ.

1. BULBOCHÆTE GIGANTEA, *Prings.* (*Wittr. Monog. Cédog.* p. 48.)

Crass. cell. veget.....	17–28 μ ;	altit. 3–4plo major;
„ „ androspor.....	23 μ ;	„ 15 μ ;
„ oospor.	67–75 μ ;	„ 55–62 μ ;
„ nannandr.	10–12·5 μ ;	„ 30–60 μ ;
„ spermogon.	12·5 μ ;	„ 13 μ .

I. Lough Creggan.

2. B. MIRABILIS, *Wittr.* (*Monog. Cédog.* p. 50.)

Crass. cell. veget..... 15–20 μ ; altit. 5–6plo major;

„ oospor. 30 μ ; „ 48 μ .

II. Lower Lake of Killarney.

3. B. PYGMÆA, *Prings. pro parte.* (*Wittr. Monog. Cédog.* p. 52.)

I. Lakes, Clifden to Roundstone.

1. CÉDOGONIUM CRYPTOPORUM, *Wittr.* (*Monog. Cédog.* p. 7.)

Crass. cell. veget.... 7·5–8·5 μ ; altit. 5–8plo major;

„ „ suffult. 12·5 μ ; „ 1½ „ „

„ oogon..... 22·5 μ ; „ 20 μ ;

„ oospor. 20 μ ; „ 16 μ .

I. Roundstone.

Var. VULGARE, *Wittr.* (*Monog. Cédog.* p. 7.)

Crass. cell. veget.... 5 μ ; altit. 5–6plo major;

„ oogon. 21–22 μ ; „ 15–17·5 μ ;

„ oospor. 18–20 μ ; „ 14–15 μ .

I. Lough Creggan.

2. CÉ. PLATYGYNUM, *Wittr.* (*Monog. Cédog.* p. 17.)

Crass. cell. veget.... 5–8 μ ; altit. 3–5plo major;

„ oogon. 26–30 μ ; „ 16–27 μ ;

„ oospor. 23 μ ; „ 13 μ .

I. Ballynahinch; Lakes, Clifden to Roundstone.—II. Castletown.

††Forma MAJOR. (Pl. XVIII. fig. 1.)

Crass. cell. veget.....	11-11.5 μ ;	altit. 2-3plo major ;
„ „ suffult. ...	12.5 μ ;	„ „ „
„ oogon.	26 μ ;	„ 16 μ ;
„ oospor.	23 μ ;	„ 13 μ .

I. Ballynahinch.

†3. *ÆDOGONTIUM LONGICOLLE*, Nord. (*Alg. Aquæ dulc. et Char. Sandvic.* p. 20, tab. 2. figs. 11-12), var. *SENEGALENSE*, Nord. (*De Alg. et Char.* i. p. 13, tab. 16. fig. 23).

Crass. cell. veget....	4.5 μ ;	altit. 3plo major ;
„ oogon.	16-18 μ ;	„ 18-23 μ ;
„ oospor.	16 μ ;	„ 11 μ .

II. Upper Lake of Killarney.

4. *Æ. UNDULATUM*, A. Br. (*Wittr. Monog. Ædog.* p. 20.)

I. Derryclare Lough ; Lakes, Clifden to Roundstone ; near Oughterard.

5. *Æ. BRAUNII*, Kuetz. (*Wittr. Monog. Ædog.* p. 22.)

Crass. cell. veget....	12.5-13.5 μ ;	altit. 4plo major ;
„ oogon.....	31 μ ;	„ 35 μ ;
„ oospor.	27.5 μ ;	„ 30 μ .

I. Clifden.

†6. *Æ. SUECICUM*, Wittr. (*Monog. Ædog.* p. 30.) (Pl. XVIII. fig. 2.)

Crass. cell. veget.....	11-12 μ ;	altit. 6-7plo major ;
„ oogon.....	34 μ ;	„ 42 μ
„ oospor. (s. spin.)	28 μ ;	„ 39 μ .

I. Ballynahinch.

††7. *Æ. PILOSPORUM*, nov. sp. (Pl. XVIII. fig. 3.)

Æ. (dioicum ?) ; oogonis singulis oblongo-ellipsoideis inflatis, utroque polo paullum productis ; oosporis subglobosis, membranis crassis et dense pilosis cum pilis brevibus ; cellula basali simile aliis.

Crass. cell. veget.....	11-12 μ ;	altit. 5-6plo major ;
„ oogon.	23 μ ;	„ 48 μ ;
„ oospor. (sine acul.)	17 μ ;	„ 18 μ ;
„ „ (cum „)	19 μ ;	„ 21 μ .
„ membr. oospor....	2 μ .	

I. Arderry Lough.

The oosporis of this species showed indications of an apical operculum, but an open one was not seen.

8. *ÆDOGONIUM CALCAREUM*, Cleve. (*Wittr. Monog. Ædog.* p. 32.)

I. Lough Aunierin; Ballynahinch.

9. *Æ.* sp.

Crass. cell. veget..... 9·5–10 μ ; altit. 3½–5plo major;
 „ oogon. 30 μ ; „ 28 μ ;
 „ oospor. 26 μ ; „ 25 μ .
 „ membr. oospor. 2·5–3 μ .

II. Upper Lake of Killarney.

This is probably *Æ. pachydermatosporum*, Nord. (*Alg. Sandv.* p. 21, tab. 2. figs. 13–15), but it was only seen in small quantity; the oogonia observed were solitary and had a superior pore; the oospores had the thick membrane of this species.

10. *Æ. PRINGSHEIMII*, Cram. (*Wittr. Monog. Ædog.* p. 33.)

Crass. cell. veget.... 14–16 μ ; altit. 2½–3½plo major;
 „ oogon. 37–40 μ ; „ 37–42 μ ;
 „ oospor. 32 μ ; „ 32 μ .

I. Ballynahinch.

11. *Æ. PUNCTATOSTRIATUM*, De Bary. (*Wittr. Monog. Ædog.* p. 34.)

I. Lough Derryclare; Lakes, Clifden to Roundstone.—II. Upper Lake of Killarney.

12. *Æ. LONDINENSE*, Wittr. (*Monog. Ædog.* p. 39.)

Crass. cell. veget.... 10·5–11·5 μ ; altit. 4–5plo major;
 „ oospor. 35 μ ; „ 35 μ .

I. Derryclare Lough.

††Var. *COMPRESSUM*, nov. var. (Pl. XVIII. figs. 10–12.)

Var. oogoniis singulis compresso-globosis; oosporis compresso-globosis, membrana glabra punctatave; cellulis vegetativis minoribus.

Crass. cell. veget.... 9–10 μ ; altit. 2½–4½plo major;
 „ oogon. 32–37 μ ; „ 25–27 μ ;
 „ oospor. 30–32 μ ; „ 22–25 μ .

II. Upper Lake of Killarney.

13. *Æ.* sp.

Membrana distincte punctata.

Crass. cell. veget. 30 μ ; altit. 1–1½plo major.

II. Lower Lake of Killarney.

Class CONFERVODEÆ ISOGAMÆ.

Ord. CONFERVACEÆ.

†1. CONFERVA STAGNORUM, *Kuetz.* (*Wille, Hvil. hos Conf.* p. 20, tab. 1. figs. 12–27, tab. 2. fig. 50.)

Crass. fil. 8·5–10 μ .

I. Near Westport; Ballynahinch.—II. Upper Lake of Killarney.

†2. C. PACHYDERMA, *Wille.* (*Hvil. hos Conf.* p. 20, tab. 1. figs. 28–35.)

I. Derryclare Lough.—II. 8 m. S. of Kenmare.

3. C. BOMBYCINA, *Ag.*, *GENUINA, *Wille.* (*Hvil. hos Conf.* p. 20, tab. 1. figs. 41–43, tab. 2. figs. 51–54.)

Crass. fil. 8·5 μ .

I. Ballynahinch; near Westport; Arderry Lough.

**MINOR, *Wille.* (*Hvil. hos Conf.* p. 21, tab. 1. figs. 36–40, tab. 2. figs. 55, 56.)

Crass. fil. 5–7·5 μ .

I. Athry Lough; Ballynahinch; Creggan Lough.

†4. C. ABBREVIATA, *Wille.* (*Hvil. hos Conf.* p. 21, tab. 2. figs. 58, 59.)

II. Cloonee Lough.

1. CLADOPHORA FLAVESCENS, *Ag.* [*C. glomerata* f. *flavescens*, *Rabh. Fl. Europ. Alg.* iii. p. 342.]

I. Near Westport.

1. DRAPARNALDIA PLUMOSA, *Ag.* (*Rabh. Fl. Europ. Alg.* iii. p. 382.)

II. Lower Lake of Killarney.

Var. PULCHELLA, *Rabh. in Fl. Europ. Alg.* iii. p. 382.

I. Near Leenane.

1. CHÆTOPHORA PISIFORMIS, *Ag.* (*Rabh. l. c.* p. 383.)

I. Baheh Loughs.

1. APHANOCHÆTE GLOBOSA, *Wolle.* [*Herposteiron globosa*, *Nord. (Alg. Sandvic.* p. 23, tab. 2. figs. 22–23).]

II. Cromagloun; Lower Lake of Killarney; Glengarriff.

2. *APHANOCHÆTE REPENS*, *A. Br.* (*Rabh. Fl. Europ. Alg.* iii. p. 391.)

II. Carrantuohill.

Ord. ULVACEÆ.

1. *PRASIOLA FURFURACEA*, *Menegh.* (*Rabh. Fl. Europ. Alg.* iii. p. 309.)

I. Roundstone.

Ord. ULOTRICHACEÆ.

1. *HORMISCIA BICOLOR*, *Cooke.* (*Br. Fr. Wat. Alg.* p. 181, pl. 70. fig. 7.)

II. Lower Lake of Killarney.

1. *ULOTHRIX RADICANS*, *Kuetz.* (*Rabh. Fl. Europ. Alg.* iii. p. 367.)

II. Kenmare Street; Castletown.

Ord. CHROOLEPIDEÆ.

1. *TRENTEPOHLIA AUREA*, *Mart.* [*Chroolepus aureus*, *Kuetz.* (*Rabh. l. c.* p. 371.)]

II. Torc Mt.

Class CONJUGATÆ.

Ord. MESOCARPEÆ.

1. *MOUGEOTIA PARVULA*, *Hass.* [*Mesocarpus parvulus*, *De Bary.* (*Rabh. Fl. Europ. Alg.* iii. p. 257.)]

Crass. cell. veget. 11–12 μ (7plo longioribus); long. spor. 24 μ ; lat. spor. 18 μ .

II. Lough Guitane.

2. *M. CAPUCINA*, *Ag.* [*Staurospermum capucinum*, *Kuetz.* (*Rabh. Fl. Europ. Alg.* iii. p. 259.)]

I. Kylemore; Ballynahinch.

3. *M. VIRIDIS*, *Wittr.* (*Om Gotl. och Ol. Sotv. Alg.* p. 39.)

I. Oughterard.

†4. *M. ELEGANTULA*, *Wittr.* (*Om Gotl. och Ol. Sotv. Alg.* p. 40, tab. 3. figs. 5–8.)

††FORMA MICROSPORA. (Pl. XVIII. fig. 17.)

Crass. cell. veget. $4\ \mu$ (16plo longioribus); long. spor. $18\ \mu$.

I. Creggan Lough.

Ord. ZYGNEMACEÆ.

1. SPIROGYRA BELLIS, *Crouan*. (*Petit, Spir. des Environs de Paris*, p. 31, tab. 10. figs. 1-3.)

Crass. cell. veget. $56-60\ \mu$ ($3\frac{1}{2}-4$ plo longioribus); diam. zygosp. $72-80\ \mu$; crass. zygosp. $50\ \mu$.

II. Water-lily pool near the Lower Lake of Killarney.

2. S. VARIANS, *Kuetz*. (*Petit, l. c.* p. 19, tab. 4. figs. 1-8.)

Forma zygosporis diametro $1\frac{1}{2}$ plo longus.

II. Cloonee Lough.

3. S. CATENÆFORMIS, *Kuetz*. (*Petit, l. c.* p. 17, tab. 3. figs. 9-12.)

Crass. cell. veget. $20\ \mu$; long. zygosp. $47-60\ \mu$; lat. zygosp. $22-24\ \mu$.

I. Lakes, Clifden to Roundstone.

4. S. TENUISSIMA, *Kuetz*. (*Petit, l. c.* p. 6, tab. 1. figs. 1-3.)

Crass. cell. veget. $14-15\ \mu$ (6plo longioribus); crass. spor. cell. $35\ \mu$; long. spor. cell. $87\ \mu$; crass. zygosp. $27\ \mu$; long. zygosp. $40\ \mu$.

I. Roundstone.

5. S. sp.

Cellulæ diametro ($34-40\ \mu$) $2\frac{1}{2}-3\frac{1}{2}$ plo longioribus, extremitatibus nunquam replicatis, fascia spirali anfractibus $2\frac{1}{2}-5\frac{1}{2}$.

Pool, Burren Hills, Co. Clare.

1. ZYGNEMA LEIOSPERMUM, *De Bary*. (*Rabh. Fl. Europ. Alg.* iii. p. 249.)

Forma cum cellulis sterilibus diametro $1\frac{1}{2}-3$ plo longioribus.

Crass. cell. veget. $20-21\ \mu$; long. $1\frac{1}{2}-3$ plo major; diam. zygosp. $25-27.5\ \mu$.

II. Glen Caragh.

††FORMA MINOR.

Forma cum cellulis sterilibus et zygosporis parvioribus.

Crass. cell. veget. 16–17 μ ; long. 2–2 $\frac{1}{2}$ plo major; diam. zygosp. 20–23 μ .

II. Cloonee Lough.

††Forma MEGASPORA. (Pl. XVIII. figs. 4–5.)

Forma sporis multum largioribus.

Crass. cell. veget. 27–28 μ ; diam. zygosp. 40–45 μ .

I. Lough Shindilla.

2. ZYGNEMA, sp.

Cellulæ diametro (18–20 μ) 2–3plo longioribus; diam. cell. veget. cum vag. 35–40 μ .

I. Lakes, Clifden to Roundstone.

††3. Z. (ZYGOGONIUM) MOMONIENSE, nov. sp. (Pl. XXIV. fig. 26.)

Z. cellulis sterilibus diametro 1 $\frac{1}{2}$ –2plo longius, tubo connexivo multe inflato; zygosporis late ellipticis (axe longiori parallelo ad filamentos), membrana glabra.

Crass. cell. veget. 20–22 μ ; long. 1 $\frac{1}{2}$ –2plo major; long. zygosp. 30–33 μ ; lat. 25–27 μ .

II. Castletown.

This species differs from *Z. Ralfsii*, De Bary, in its larger size, its shorter sterile cells, and its much larger, differently shaped zygospores.

Ord. DESMIDIACEÆ.

1. GONATOZYGON RALFSII, *De Bary*. (*Cooke, Brit. Desm.* p. 2, tab. 1. fig. 1.)

I. Near Westport; near Recess; Baheh Loughs.—II. Muckross; Glengarriff.

2. G. BREBISSEI, *De Bary*. (*Cooke, Brit. Desm.* p. 2, tab. 1. fig. 2.)

Long. 157 μ ; lat. 9 μ ; lat. apic. 7 μ .

I. Near Westport; Baheh Loughs; Lakes, Clifden to Roundstone; Roundstone; Lough Aunierin; Athry Lough.—II. Lough Guitane; Upper and Lower Lakes of Killarney; Adrigole; Castletown; Glengarriff; Carrantuohill; Cloonee Lough.

3. G. MINUTUM, *West*. (*Fr. Wat. Alg. of N. Wales*, p. 282, tab. 5. fig. 1.)

Long. 62–85 μ ; lat. 3–5 μ ; lat. apic. 3–4 μ .

I. Roundstone; Ballynahinch; Lakes E. of Lough Bofin; Athry Lough.—II. Lough Guitane; near Lough Brin.

4. GONATOZYGON KINAHANI, *Rabh.* (*Fl. Europ. Alg.* iii. p. 156.)

Long. 232 μ ; lat. 12.5 μ ; lat. apic. 12.5 μ .

I. Lakes near Recess; Ballynahinch.

5. G. LÆVE, *Hilse.* [G. læve, *West (Fr. Wat. Alg. of N. Yorks., in Journ. Bot.* Oct. 1889, tab. 291. fig. 6).]

I. Clifden; Lough Shannacloontippen; Derryclare Lough.—II. Lough Guitane; near Lough Brin.

1. SPHEROZOSMA VERTEBRATUM, *Ralfs in Brit. Desm.* p. 65, tab. 6. fig. 1.

I. Derryclare Lough.—II. Lough Guitane.

†2. S. AUBERTIANUM, *West. (Fr. Wat. Alg. of Maine, in Journ. Bot.* July 1889, p. 2; Oct. 1889, tab. 291. fig. 17). (Pl. XIX. fig. 1.)

Long. 17.5–19 μ ; lat. 20–21 μ ; lat. isthm. 5–6 μ .

I. Derryclare Lough.

3. S. EXCAVATUM, *Ralfs. (Brit. Desm.* p. 67, tab. 6. fig. 2.)

I. Near Westport; Lakes near Recess; Baheh Loughs; Roundstone; Athry Lough; Letereen Lough; Ballynahinch; Lough Creggan; Lakes, Clifden to Roundstone; Lough Derryclare; small lakes, east of Lough Bofin; Lough Oorid; Lough Shannacloontippen.—II. Muckcross; Lough Guitane; Upper and Lower Lakes of Killarney; Carrantuohill; Adrigole; near Lough Brin.

4. S. GRANULATUM, *Roy et Biss. (Jap. Desm. in Journ. Bot.* July & Aug. 1886, p. 242, tab. 268. fig. 17.)

I. Lakes, Clifden to Roundstone; Derryclare Lough; Clifden.—II. Lough Guitane; Muckcross.

1. SPONDYLIOSIUM PULCHELLUM, *Arch. (Pritch. Infus.* ed. 1861, p. 724, tab. 3. fig. 10.)

Long. 13–16 μ ; lat. ad bas. semicell. 14–16 μ ; lat. ad apic. 7–8 μ ; lat. isthm. 3.5–4.5 μ ; crass. 7–8 μ .

I. Ballynahinch; Clifden; Lakes, Clifden to Roundstone.—II. Glen Caragh; Carrantuohill.

††2. S. TETRAGONUM, nov. sp. (Pl. XIX. fig. 2.)

Sp. filis tortis, sine vagina mucosa; cellulæ diametro paulo

longius, apicibus truncatis, angulis rotundatis, leviter et latissime constrictæ, lateribus rotundatis; a vertice visæ ellipticæ; a latere visæ oblongæ, leviter constrictæ.

Long. 8·5–10 μ ; lat. 10 μ ; lat. isthm. 8 μ ; crass. 6 μ .

I. Kylemore.

3. SPHÆROZOSMA PYGMÆUM, *nov.* [Sphærozosma pygmæum, *Cooke* (*Brit. Desm.* p. 5, pl. 2. fig. 5), non *Rabh.* (*Fl. Eur. Alg.* iii. p. 150).]

I. Near Westport.

The Irish specimens seen had no mucous sheath; those seen from Mickle Fell (Freshwater Algæ of N. Yorks. in *Journ. Bot.* Oct. 1889) had a sheath 11 μ in diameter.

†4. S. PULCHRUM, *Arch.*, var. TRIQUETRUM, *Lund* (*Desm. Succ.* p. 93). (Pl. XIX. fig. 3.)

Long. cell. 20–22 μ ; lat. 28–30 μ ; lat. isthm. 22–27 μ .

I. Lakes, Clifden to Roundstone.

1. ONYCHONEMA FILIFORME, *Roy et Biss.* (*Jap. Desm.* p. 242). [O. Nordstedtiana, *Turn.*]

I. Lakes near Recess; Derryclare Lough; Clifden; Roundstone.

1. HYALOTHECA DISSILIENS, *Bréb. in Ralfs, Brit. Desm.* p. 51, tab. 1. fig. 1.

Long. 12·5–15 μ ; lat. 19–21 μ ; lat. isthm. 14–17 μ ; diam. zygosp. 20–33 μ .

I. Near Westport; near Leenane; Ballynahinch (cum zygosp.); Arderry, Oorid, and Derryclare Loughs; Roundstone; near Oughterard (cum zygosp.); Lakes, Clifden to Roundstone; Lakes near Recess (cum zygosp.).—II. Upper and Lower Lakes of Killarney; Carrantuohill; Cromagloun; Sugar Loaf Mt.; Lough Guitane (cum zygosp.); Mallow; near Lough Brin; Glen Caragh; Castletown.

Forma BIDENTULA, *Boldt (Desm. från Grönl.* p. 43). [H. dissiliens, *Bréb.*, var. bidentula, *Nord. (Norges Desm.* p. 48, tab. 1. fig. 22).]

II. Lough Guitane.

Var. HANS, *Wolle. (Freshw. Alg. of U. S.* p. 21, pl. 54. figs. 14–16.)

I. Clifden.

2. *HYALOTHECA MUCOSA*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 53, tab. 1. fig. 2.)

I. Near Oughterard; Derryclare Lough.—II. Muckcross; Carrantuoohill; Glen Caragh.

3. *H. UNDULATA*, *Nord. in Nord. et Wittr. Alg. Exsic.* no. 248.

Long. cell. 15–17·5 μ ; lat. 7·5–8 μ ; lat. isthm. 6·5–7·5 μ ; diam. fil. cum vag. 25 μ .

I. Ballynahinch; Roundstone.—II. Upper Lake of Killarney; Lough Guitane; Adrigole.

1. *GYMNOZYGA MONILIFORMIS*, *Ehrenb.* [*Bambusina Brebissonii, Kuetz.*; *Didymoprium Borreri, Ralfs.*]

Long. cell. 25–30 μ ; lat. ad bas. semicell. 17·5–22·5 μ ; lat. ad apic. 15·2–17·5 μ ; long. zygosp. 25–35 μ ; lat. zygosp. 20–24 μ .

I. Near Westport; Ballynahinch; Lakes near Recess (cum zygosp.); near Oughterard; Arderry, Oorid, and Derryclare Loughs; near Leenane; Kylemore; Lakes, Clifden to Roundstone.—II. Torc Mt.; Cromagloun; Upper and Lower Lakes of Killarney; Glen Caragh; Castletown; Glengarriff; Sugar Loaf Mt.

1. *DESMIDIUM CYLINDRICUM*, *Grev.* [*Didymoprium Grevillei, Ralfs (Brit. Desm.* p. 57, tab. 2).]

Long. 22–25 μ ; lat. 49–52 μ ; lat. isthm. 40–42 μ ; lat. apic. 37–40 μ ; crass. 35–40 μ .

I. Ballynahinch (cum zygosp.); Arderry Lough; near Oughterard; Lakes near Recess; Lakes, Clifden to Roundstone; Roundstone.—II. Torc Mt.; Sugar Loaf Mt.; Castletown; Adrigole; Glengarriff.

2. *D. SWARTZII*, *Ag.* (*Ralfs, Brit. Desm.* p. 61, tab. 4.)

I. Near Westport; Ballynahinch; Lakes, Clifden to Roundstone; near Oughterard; near Leenane; Lough Shannacloon-tippen; Kylemore.—II. Cromagloun; Clogherheen; near Lough Brin; Sugar Loaf Mt.; Adrigole; Glengarriff.

3. *D. APTOGONUM*, *Bréb.* [*Aptogonum Desmidium, Ralfs (Brit. Desm.* p. 64, tab. 23. fig. 1).]

I. Ballynahinch; Roundstone.

1. *DOCIDIUM BACULUM*, *Bréb. in Ralfs, Brit. Desm.* p. 158, tab. 33. fig. 5.

Long. 167–262 μ ; lat. ad bas. inflat. 12–13 μ ; lat. apic. 8·5–10 μ .

I. Near Westport; Moher Lough; Roundstone; Arderry Lough; Lough Aunierin; Ballynahinch; Lakes, Clifden to Roundstone; Lough Shannaclontippen.—II. Cromagloun; Castletown; Glengarriff; Adrigole.

†2. *DOCIDIUM DILATATUM*, *Lund.* (*Desm. Suec.* p. 88, tab. 5. fig. 12.) (Pl. XIX. fig. 5.)

Long. 225 μ ; lat. ad bas. semicell. 16 μ ; lat. ad apic. 13–15 μ .

I. Near Oughterard; Kylemore; Oorid Lough.—II. Cromagloun; Tore Mt.; Glen Caragh.

A form from Cromagloun was noticed which had from 12–13 undulations to each semicell. Long. 262 μ ; lat. 13–14 μ . (Pl. XIX. fig. 6.)

††Var. *SUBUNDULATUM*, nov. var. (Pl. XIX. fig. 7.)

Var. undulis minoribus profundis, cellulis brevioribus, semicellulis inflatis medio et membrana forte punctata.

Long. 187 μ ; lat. 15 μ .

I. Near Oughterard.—II. Glen Caragh.

1. *PLEUROTENIUM CORONATUM*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 143.) (Pl. XIX. figs. 8–10.)

Long. 465–560 μ ; lat. ad bas. semicell. 42–58 μ ; lat. ad apic. 37–45 μ .

I. Lough Derryclare; Lough Aunierin; Lough Shannaclontippen.

††Var. *FLUCTUATUM*, nov. var. (Pl. XIX. fig. 11.)

P. diametro 15–16plo longius; semicellulis non angustis polos versus, undulatis in ambitu toto.

Long. 670 μ ; lat. ad bas. inflat. 55 μ ; lat. ad med. semicell. 43 μ ; lat. ad apic. 50 μ .

I. Lough Aunierin.

††Var. *ROBUSTUM*, nov. var. (Pl. XIX. fig. 12.)

P. circiter diametro 8plo longius; semicellulis cylindricis, leviter subundulatis lateribus, contractis distincte ad apicem extremum.

Long. 460 μ ; lat. ad bas. inflat. 57 μ ; lat. ad med. semicell. 55 μ ; lat. ad apic. 48 μ .

I. Lough Derryclare.

Var. *NODULOSUM* (*Bréb.*), *nob.* [*Docidium coronatum*, *Bréb.*, var. *nodulosum* (*Bréb.*), *Roy* (*Fr. Wat. Alg. of Enbridge Lake and vicinity*, in *Journ. Bot.* Nov. 1890).]

II. Cloonee Lough; 8 m. S. of Kenmare.

In a gathering from near Paris, recently examined, an intermediate form between *P. coronatum* and var. *nodulosum* was abundant.

2. *PLEUROTÆNIUM EHRENBERGII*, *De Bary.* [*Docidium Ehrenbergii*, *Ralfs* (*Brit. Desm.* p. 157, tab. 26. fig. 4).]

Long. 262–400 μ ; lat. ad bas. semicell. 18–22.5 μ ; lat. ad apic. 16–18 μ .

I. Near Westport; Kylemore; Roundstone; Moher Lough; Creggan Lough; near Ballynahinch; Lakes, Clifden to Roundstone; Lakes near Recess; Lough Aunierin; Lough Shannacloontippen; Lough Derryclare; Athry Lough.—II. Lough Guitane; Muckcross; Upper and Lower Lakes of Killarney; Glengarriff; near Lough Brin; Castletown; Adrigole; 8 m. S. of Kenmare.

Var. *ELONGATUM*, *West.* [*Docidium Ehrenbergii*, *Ralfs*, var. *elongatum*, *West*, in *Fr. Wat. Alg. of N. Wales*, p. 284.]

Long. 525 μ ; lat. ad bas. inflat. 26 μ ; lat. ad apic. 19 μ ; lat. ad med. semicell. 21 μ .

I. Clifden.

3. *P. CLAVATUM*, *De Bary.* [*Docidium clavatum*, *Kuetz.* in *Ralfs*, *Brit. Desm.* p. 156, tab. 26. fig. 3.]

Long. 500 μ ; lat. ad bas. inflat. 22 μ ; lat. ad apic. 19 μ .

I. Near Westport; Roundstone; Arderry Lough; Lough Aunierin; near Ballynahinch.

4. *P. MAXIMUM*, *Lund.* (*Desm. Succ.* p. 89.)

Long. 212–300 μ ; lat. ad bas. inflat. 18–27 μ ; lat. ad apic. 15–20 μ .

I. Arderry, Aunierin, and Oorid Loughs; Ballynahinch.—II. Cromagloun; Glen Caragh; Sugar Loaf Mt.; near Lough Brin; Carrantuohill; Glengarriff.

5. *P. TRUNCATUM*, *Naeg.* [*Docidium truncatum*, *Bréb.* in *Ralfs*, *Brit. Desm.* p. 156, tab. 26. fig. 2.]

Long. 440–467 μ ; lat. ad bas. semicell. 55–60 μ ; lat. ad apic. 33–35 μ .

I. Near Westport; near Oughterard; Lakes, Clifden to Roundstone; Aunierin and Moher Loughs.—II. Cromagloun.

6. PLEUROTÆNIUM RECTUM, *Delp.* (*Desm. Subalp.* p. 225, tab. 20. figs. 8–11.)

II. Cromagloun.

†7. *P. TRIDENTULUM*, *nob.* [*Docidium tridentulum* (*Wolle, Desm. U. S.* p. 52, pl. 10. fig. 10).]

P. mediocre, circiter trigies longius quam latum; semicellulæ modice inflatæ ad basin; gradatim attenuatæ; ad apices truncatæ, tribus quatuorve spinis brevibus; membrana glabra [vel granulata (var. *granulatum*, *nob.*)].

††Var. CAPITATUM, *nov. var.* (Pl. XXIV. fig. 12.)

Var. semicellulæ granulatæ, minores inflatæ ad basin, apicibus subcapitatis et glabris, spinis brevioribus.

Long. 495 μ ; lat. ad bas. semicell. 22·5 μ ; lat. ad apic. 13·5 μ . [*Hab.* United States of America.]

This differs from the type in its capitate apices and its shorter spines. Mr. Wolle says in his short description "often granulate." A specimen of the type seen from Harvey Lake, U.S.A., was smooth and agreed with Wolle's figure with the exception of having a much smaller basal inflation.

Var. CAPITATUM, *nov. var.* Forma membrana minus granulata.

I. Lakes, Clifden to Roundstone.

1. CLOSTERIUM DIDYMOTOCUM, *Corda.* (*Ralfs, Brit. Desm.* p. 168, tab. 28. fig. 7.)

Long. 262–450 μ ; lat. 24–45 μ ; lat. ad apic. 13–20 μ .

I. Creggan Lough; near Westport; Lakes, Clifden to Roundstone; near Ballynahinch; Kylemore; Roundstone; Oorid Lough; Lough Aunierin; near Oughterard.—II. Car-rantuohill; Glen Caragh; Castletown; Sugar Loaf Mt.; Kenmare; Glengarriff; near Lough Brin; Upper Lake of Killarney.

2. *C. DIRECTUM*, *Arch.* (*Rabh. Fl. Europ. Alg.* iii. p. 127.)

Long. 220–260 μ ; lat. 11–12·5 μ ; lat. ad apic. 8·5 μ .

I. Ballynahinch.—II. Glen Caragh ; Castletown ; Carrantuohill.

3. *CLOSTERIUM OBTUSUM*, Bréb. (*Rabh. Fl. Europ. Alg.* p. 124.)

Long. 75μ ; lat. 12μ .

I. Kylemore.—II. Carrantuohill.

4. *C. LUNULA*, Ehrenb. (*Ralfs, Brit. Desm.* p. 163, tab. 27. fig. 1.)

I. Ballynahinch ; Creggan Lough ; Arderry Lough ; Roundstone ; near Westport ; near Oughterard ; Kylemore ; Oorid Lough ; Lakes E. of Lough Bofin.—II. Lough Guitane ; Tore Mt. ; Cromagloun ; Upper Lake of Killarney ; Clogerheen ; Glen Caragh ; Sugar Loaf Mt. ; Castletown ; Adrigole ; Glengarriff.

5. *C. ACEROSUM*, Ehrenb. (*Ralfs, Brit. Desm.* p. 164, tab. 27. fig. 2.)

I. Athry Lough.—II. Lower Lake of Killarney ; Mallow ; Glengarriff ; Cloonee Lough.

6. *C. TUBRIDUM*, Ehrenb. (*Ralfs, l. c.* p. 165, tab. 27. fig. 3.)

I. Lough Creggan ; Lough Aunierin.—II. Sugar Loaf Mt. ; Castletown ; Adrigole.

7. *C. PRITCHARDIANUM*, Arch., ††var. *MINUS*, nov. var. (Pl. XIX. fig. 13.)

Var. dimidio minus diametro quam forma typica et striis paucioribus.

Long. 300μ ; lat. 12.5μ ; lat. ad apic. 7.5μ .

I. Lough Derryclare.

8. *C. PRÆLONGUM*, Bréb. (*Rabh. Fl. Europ. Alg.* iii. p. 130.)

I. Near Leenane.

††9. *C. TOXON*, nov. sp. (Pl. XIX. fig. 14.)

Cl. circiter diametro 30plo longius, linearis, prope rectum, levissime concavum ad medium marginis superioris, leviter curvatum apices subtruncatos versus ; massa chlorophyllacea in modo subspiralis non ordinata, laminis obscuris et cum pyrenoidibus minutis numerosis dispersis, locello distincto subapicali corpuscula 2-3 includente. Membrana achroa et non striata.

Long. 220–300 μ ; lat. 8·5–10 μ .

I. Ballynahinch; Derryclare Lough.—II. Cromagloun.

10. *CLOSTERIUM GRACILE*, *Bréb. in Ralfs, Brit. Desm.* p. 221.

I. Near Westport; Roundstone; near Leenane; Kylemore; Ballynahinch; Lakes near Recess; Lough Shannaclontippen; Lough Aunierin; Shindilla and Arderry Loughs; near Oughterard; Athry Lough.—II. Adrigole; near Lough Brin; Torc Mt.; Cromagloun; Upper Lake of Killarney; Clogerheen; Glen Caragh; Sugar Loaf Mt.; Castletown; Carrantuohill.

†† *Forma GRACILLIMA*. (Pl. XIX. fig. 15.)

Forma distincte attenuata, quam forma typica 1½plo longius.
Long. 440 μ ; lat. 5 μ .

I. Arderry Lough.

A form of *f. gracillima* was observed from Kylemore, with obtuse ends: long. 375–410 μ ; lat. 3·5–4 μ .

11. *C. EHRENBERRGII*, *Menegh. (Ralfs, Brit. Desm.* p. 166, tab. 28. fig. 2.)

II. Carrantuohill.

12. *C. MONILIFERUM*, *Ehrenb. (Ralfs, l. c.* p. 166, tab. 28. fig. 3.)

Lat. 37–40 μ .

I. Near Westport.—II. Cromagloun; Kenmare; Upper Lake of Killarney.

13. *C. JENNERI*, *Ralfs. (Brit. Desm.* p. 167, tab. 28. fig. 6.)

Lat. 7–8 μ .

I. Near Westport; Creggan and Aunierin Loughs; near Leenane; Ballynahinch.—II. Loughs Guitane and Cloonee; Upper Lake of Killarney; Sugar Loaf Mt.; Glengarriff; Glen Caragh.

14. *C. LEIBLEINII*, *Kuetz. (Ralfs, Brit. Desm.* p. 167, tab. 28. fig. 4.)

Lat. 35–37 μ .

I. Near Westport; Creggan Lough.—II. Near Lough Brin.

Var. β , *Ralfs. (Brit. Desm.* p. 167.)

I. Ballynahinch.

15. *C. DIANÆ*, *Ehrenb. (Ralfs, l. c.* p. 168, tab. 28. fig. 5.)

Lat. 8·5–12·5 μ .

I. Near Westport; Moher, Shannaclontippen, and Athry Loughs; Kylemore; Roundstone; Ballynahinch; near Leenane; Lakes E. of Lough Bofin.—II. Loughs Guitane and Cloonee; Upper and Lower Lakes of Killarney; Glen Caragh; Carrantuohill; Sugar Loaf Mt.

16. *CLOSTERIUM PSEUDODIANÆ*, Roy. (*Desq. Alford district, Scot. Naturalist*, Jan. 1890; *icon in lit.*)

II. Adrigole; Glen Caragh.

17. *C. VENUS*, Kuetz. (*Ralfs, Brit. Desm.* p. 220, tab. 35. fig. 12.)

I. Near Oughterard; Lough Aunierin; Ballynahinch; Lakes near Recess; Creggan Lough.—II. Lower Lake of Killarney; Sugar Loaf Mt.; Kenmare; Glen Caragh; Glengariff; Cloonee Lough.

18. *C. INCURVUM*, Bréb. [*C. Leibleinii*, Kuetz., var. minus, *Rabh. (Fl. Europ. Alg.* p. 132).]

II. Carrantuohill.

19. *C. CYNTHIA*, De Not. (*Cooke, Brit. Desm.* p. 26, tab. 13. fig. 2.)

Lat. 15–17·5 μ .

I. Lakes, Clifden to Roundstone; near Westport.—II. Lough Guitane.

20. *C. ARCHERIANUM*, Cleve, in *Lund, Desm. Suec.* p. 77, tab. 5. fig. 13.

Lat. 22·5–30 μ .

I. Near Westport; Ballynahinch; Lakes, Clifden to Roundstone; Lough Shannaclontippen; Roundstone.—II. Lough Guitane; Cromagloun; Clogerheen; Sugar Loaf Mt.; Glen Caragh; Castletown; Cloonee Lough.

21. *C. COSTATUM*, Corda. (*Alm. de Carlsbad*, 1835, tab. 5. figs. 61–63.)

Long. 365 μ ; lat. 48 μ .

I. Near Oughterard; Lough Creggan; Lakes, Clifden to Roundstone; Lough Aunierin.—II. Cromagloun; Lough Guitane near Lough Brin; Glen Caragh; Castletown; Adrigole; Carrantuohill.

22. *CLOSTERIUM STRIOLATUM*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 170, tab. 29. fig. 2.)

I. Near Westport; near Leenane; Kylemore; Lakes, Clifden to Roundstone; Oorid Lough; Roundstone; near Oughterard; Creggan Lough; near Recess; Lough Shannacloontippen.—II. Cromagloun; Glen Caragh; Cloonee Lough; Sugar Loaf Mt.; Castletown.

Var. *ORTHONOTUM*, *Roy.* (*Fr. Wat. Alg. of Enbridge Lake and Vicinity, Journ. of Bot.* 1890, p. 336.)

Long. 300 μ ; lat. 28 μ ; lat. ad apic. 8–9 μ .

I. Lakes, Clifden to Roundstone.—II. Glen Caragh; near Lough Brin; Adrigole.

23. *C. INTERMEDIUM*, *Ralfs.* (*Brit. Desm.* p. 171, tab. 29. fig. 3.)

I. Lough Arderry; Kylemore; near Westport; Creggan Lough; Lough Aunierin.—II. Castletown; Carrantuohill.

24. *C. ANGUSTATUM*, *Kuetz.* (*Ralfs, l. c.* tab. 29. fig. 4.)

Long. 310–400 μ ; lat. 16–22 μ ; lat. ad apic. 12–13 μ .

I. Near Westport; Roundstone; Ballynahinch.—II. Castletown; Carrantuohill; Sugar Loaf Mt.

25. *C. JUNCIDUM*, *Ralfs.* (*Brit. Desm.* p. 172, tab. 29. fig. 6.)

I. Near Westport; near Leenane; Ballynahinch; Kylemore; Lough Aunierin.—II. Tore Mt.; Cromagloun; Sugar Loaf Mt.; Adrigole; Kenmare.

26. *C. LINEATUM*, *Ehrenb.* (*Ralfs, l. c.* p. 173, tab. 30. fig. 1.)

Long. 340 μ ; lat. 13 μ .

I. Near Westport; near Leenane; Ballynahinch; near Oughterard; Kylemore; Roundstone.—II. Cromagloun; Lower Lake of Killarney; Glen Caragh; Castletown; Adrigole.

27. *C. ATTENUATUM*, *Ehrenb.* (*Ralfs, l. c.* p. 167, tab. 29. fig. 5.)

I. Kylemore; Lough Shannacloontippen; near Westport; Derryclare Lough; Ballynahinch.—II. Sugar Loaf Mt.; Glen Caragh.

28. *C. RALFSII*, *Bréb.*, var. *HYBRIDUM*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 135.)

Long. $462\ \mu$; lat. $31\ \mu$.

I. Lough Aunierin.—II. Cromagloun.

29. *CLOSTERIUM ROSTRATUM*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 175, tab. 30. fig. 3.)

I. Lough Aunierin; near Leenane.—II. Lower Lake of Killarney; Glen Caragh; Glengariff.

30. *C. SETACEUM*, *Ehrenb.* (*Ralfs, l. c.* p. 176, tab. 30. fig. 4.)

I. Kylemore; Lough Aunierin; Ballynahinch; Roundstone.—II. Muckcross; near Lough Brin; Adrigole.

31. *C. KÜTZINGII*, *Bréb.* (*Cooke, Brit. Desm.* p. 34, tab. 15. fig. 3.)

Long. $435\text{--}500\ \mu$; lat. $15\text{--}20\ \mu$; long. zygosp. $48\ \mu$; lat. zygosp. $35\ \mu$.

I. Baheh Loughs; Kylemore (cum zygosp.).

32. *C. PRONUM*, *Bréb.* (*Rabh. Fl. Europ. Alg.* iii. p. 136.)

I. Near Westport; near Leenane; near Oughterard; Ballynahinch; Clifden.

33. *C. CORNU*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 176, tab. 30. fig. 6.)

I. Creggan Lough; near Westport.

FORMA MAJOR, *Wille.* (*Ferskv. fra Nov. Seml.* p. 59, tab. 14. fig. 81.)

I. Kylemore.

34. *C. ACUTUM*, *Bréb. in Ralfs, Brit. Desm.* p. 177, tab. 30. fig. 5.

I. Creggan Lough.—II. Near Lough Brin; Lower Lake of Killarney; Adrigole.

35. *C. SUBULATUM*, *Bréb.* [*C. acutum*, *Bréb.*, var. β , *Ralfs.*]

Long. $177\ \mu$; lat. $12\cdot5\ \mu$.

I. Lough Aunierin; near Oughterard.—II. Adrigole.

36. *C. LINEA*, *Perty.* [*C. pronum*, *Bréb.*, d. *linea*, *Klebs (Desm. Pruss.* p. 19, tab. 2. fig. 14).]

I. Ballynahinch; Ooid Lough.—II. Lower Lake of Killarney.

†37. CLOSTERIUM SUBTILE, *Bréb.*, forma. (Pl. XIX. fig. 16.)

A figure of a narrow form of this is given. Long. 91 μ ; lat. 2 μ .

II. Cromagloun.

1. PENIUM MARGARITACEUM, *Breb. in Ralfs, Brit. Desm.* p. 149, tab. 25. fig. 1.

I. Kylemore; Roundstone; Ballynahinch.—II. Carrantuo-hill.

Var. PUNCTATUM, *Ralfs. (Brit. Desm. p. 149.)*

I. Lough Shannaclontippen.—II. Lough Guitane.

2. P. CYLINDRUS, *Bréb. in Ralfs, Brit. Desm.* p. 150, tab. 25. fig. 3.

I. Kylemore; Ballynahinch; Roundstone; Lough Shanna-clontippen.

3. P. RUFOPELLITUM, *Roy. (Perthshire Desmids, Scot. Nat.* April 1877.)

Long. 40–45 μ ; lat. 10–12.5 μ .

I. Kylemore.

†† 4. P. EXIGUUM, nov. sp. (Pl. XIX. figs. 17, 18.)

P. parvum, cylindricum, 3–6plo longius quam latius, medio fere distincte constrictum (nonnunquam non constrictum), apicibus truncatis (nonnunquam amplioribus); membrana delicatissime granulata, granulis irregulariter dispositis, achroa; pyrenoidibus 2–3 in utroque semicellula in serie lineari ordinatis; locello subapicali corpuscula mobilia includente.

Long. 18.5–37 μ ; lat. 6–8.5 μ .

I. Kylemore.—II. Cromagloun.

This species differs from *P. margaritaceum*, *Bréb.*, and *P. cylindrus*, *Bréb.*, in its smaller size, in the smaller granules which are not arranged in longitudinal lines, and in its colourless membrane. It also differs from *P. conspersum*, *Wittr.* (*Om Gotlands och Ölands Sötvattens-Alger*, p. 66) in its much smaller size, different form, &c.

5. P. SPIROSTRIOLATUM, *Bark. (Cooke, Brit. Desm. p. 39; Turner, in Journ. Roy. Micr. Soc. 1885, p. 939, tab. 16. fig. 26.)*

Long. 130–160 μ ; lat. 17–20 μ .

I. Ballynahinch; Lough Aunierin; Lough Shannaclontippen; near Leenane; near Westport; Roundstone.—II. Lough Gui-

tane; Cloonee Lough; Cromagloun; Castletown; Glengarriff; Carrantuohill; 8 m. S. of Kenmare.

6. *PENIUM DIGITUS*, *Bréb. in Ralfs, Brit. Desm.* p. 150, tab. 25. fig. 3.

Long. 80–387 μ ; lat. 20–82 μ ; lat. ad apic. 18–40 μ .

I. Near Westport; Letereen Lough; Lough Creggan; near Oughterard; Lakes, Clifden to Roundstone; Ballynahinch; Roundstone; Derryclare Lough; Kylemore; Oorid Lough; Arderry Lough; Lough Shannaclontippen; Lough Shindilla; Lough Aunierin.—II. Lough Guitane; Cromagloun; Tore Mt.; Lower Lake of Killarney; Glen Caragh, near Lough Brin; Carrantuohill; Castletown; Glengarriff; Cloonee Lough; 8 m. S. of Kenmare.

††Var. *CONSTRICITUM*, nov. var.

P. diametro 6–8plo longius, apicibus truncatis, distincte sed late constrictum.

Long. 353–405 μ ; lat. in centro 47–55 μ ; lat. max. 55–65 μ .

I. Lakes, Clifden to Roundstone.

7. *P. INTERRUPTUM*, *Bréb. in Ralfs, Brit. Desm.* p. 151, tab. 25. fig. 4.

I. Lough Aunierin; Creggan Lough; near Westport.

††Var. *SECTUM*, nov. var.

Var. *apicibus repente truncatis; membrana rufescente.*

Long. 258 μ ; lat. max. 47 μ ; lat. ad apic. 20–22 μ .

I. Near Westport.

8. *P. CLOSTERIOIDES*, *Ralfs. (Brit. Desm. p. 152, tab. 34. fig. 4.)*

Long. 102–115 μ ; lat. 20–22 μ ; lat. apic. 9–11 μ .

I. Near Westport; near Leenane; Creggan Lough; Ballynahinch; Derryclare Lough; Lough Aunierin; near Oughterard; Kylemore.—II. Carrantuohill; Glen Caragh; Castletown; Adrigole.

9. *P. NAVICULA*, *Bréb. (Rabh. Fl. Alg. Europ. iii, p. 121.)*

Long. 32–41 μ ; lat. 10–15 μ ; lat. apic. 6–7 μ .

I. Lough Shannaclontippen; Ballynahinch; Roundstone; Lough Aunierin; Lakes east of Lough Bofin; Kylemore; Creggan Lough.—II. Lough Guitane; Muckcross; Adrigole; Glen

Caragh; Lower Lake of Killarney; Cloonee Lough; Glengarriff; Carrantuohill.

10. PENIUM JENNERI, *Ralfs.* (*Brit. Desm.* p. 153, tab. 33. fig. 2.)

I. Lakes near Recess.

11. P. OBLONGUM, *De Bary.* (*Rabh. Fl. Europ. Alg.* iii. p. 119.)

II. Carrantuohill.

12. P. TRUNCATUM, *Ralfs.* (*Brit. Desm.* p. 152, tab. 25. fig. 5.)
Long. $42\ \mu$; lat. $12\cdot5\ \mu$.

I. Near Oughterard; Moher Lough.—II. Carrantuohill; Glengarriff; Lower Lake of Killarney; Castletown.

Forma PUNCTATA, *West.* (*Additions Freshw. Alg. W. Yorks., in Naturalist*, Aug. 1891, p. 245.)

I. Clifden.

13. P. POLYMORPHUM, *Perty.* (*Lund, Desm. Suec.* p. 86, tab. 5. fig. 10.)

I. Clifden.—II. Carrantuohill; 8 m. S. of Kenmare.

†14. P. ADELOCHONDRUM, *Elfv.* (*Anteck. om Finska Desmidieer.*) (Pl. XIX. fig. 19.)

Long. $45\ \mu$; lat. $16\cdot5\ \mu$.

II. Cromagloun.

15. P. MOOREANUM, *Arch.* (*Cooke, Brit. Desm.* p. 44.)

Long. $20\ \mu$; lat. $7\cdot5\text{--}8\ \mu$; long. zygosp. $22\cdot5\ \mu$; lat. zygosp. $17\cdot5\ \mu$; crass. zygosp. $15\ \mu$.

I. Near Oughterard.—II. Carrantuohill.

††16. P. SUBOCTANGULARE, nov. sp. (Pl. XXIV. fig. 20.)

P. minutum, circiter $1\frac{1}{2}$ plo longius quam latius, oblongo-ellipticum, apicibus late rotundatis, membrana glabra et achroa; zygospore quadratæ oblongæ angulis truncatis subretusisque, e vertice et e latere visæ ellipticæ, membrana crassa et rufescente.

Long. $14\text{--}16\ \mu$; lat. $10\ \mu$; long. zygosp. $25\text{--}28\ \mu$; lat. zygosp. $20\text{--}25\ \mu$; crass. zygosp. $18\ \mu$.

II. Lower Lake of Killarney.

17. P. CUCURBITINUM, *Biss.* (*Journ. Roy. Micr. Soc.* 1884, p. 197, tab. 5. fig. 7.)

I. Lakes near Recess; Ballynahinch.—II. Castletown; Carrantuohill.

- †18. PENIUM CLEVEL, *Lund*. (*Desm. Suec.* p. 86, tab. 5. fig. 11.)
 Long. 106 μ ; lat. 45 μ ; lat. isthm. 42 μ .
 I. Roundstone; Ballynahinch.

19. P. MINUTUM, *Cleve*. [*Docidium minutum*, *Ralfs*; *Penium minutum*, *d. genuinum*, *Racib.* (*Nonnul. Desm. Polon.* p. 5, tab. 5. fig. 11).]

FORMA GENUINA.

Long. 97–168 μ ; lat. ad bas. semicell. 12·5–14 μ ; lat. ad apic. 8·5–11 μ .

I. Near Westport; Ballynahinch; Kylemore; Roundstone; Glendalough; near Oughterard; Loughs Aunierin and Shindilla; Lakes near Recess; near Leenane; Nacogarrow Lough.—II. Cromagloun; Torc Mt.; Carrantuohill; Glen Caragh; Sugar Loaf Mt.; Adrigole; Glengarriff.

FORMA MAJOR, *Lund*. (*Desm. Suec.* p. 87.) [P. minut. *c.* major, *Lund* (*Racib. l. c.*)]

Long. 202–210 μ ; lat. prope bas. semicell. 12·5 μ ; lat. prope apic. 9 μ .

I. Ballynahinch.

†FORMA MINOR, *Racib.* [P. minut. *b. minor*, *Racib.* (*l. c.*)]

Long. 73 μ ; lat. prope bas. semicell. 11·5 μ ; lat. prope apic. 9 μ .

II. Cromagloun.

The form noticed was not exactly cylindrical as in *Raciborski's* description, but somewhat tapering.

Var. GRACILE, *Wille*. (*Bg. till Kunds. om Norges Ferskv.* p. 51, tab. 2. fig. 33.) [P. minut. *a. gracile*, *Wille* (*Racib. l. c.*)]

Long. 130–160 μ ; lat. prope bas. semicell. 10·5–12 μ ; lat. prope apic. 10 μ .

I. Near Oughterard; Ballynahinch.—II. Cromagloun.

†Var. TUMIDUM, *Wille* (*l. c. f. 34*). [P. minut. *f. tumidum*, *Wille* (*Racib. l. c.*)]

Long. 90–102 μ ; lat. max. 17·5–20 μ ; lat. isthm. 13–15 μ ; lat. prope apic. 11–12·5 μ .

I. Ballynahinch.

†Var. ALPINUM, *Racib.* [P. minut. *e. alpinum*, *Racib.* (*Nonnul. Desm. Polon.* p. 5).]

Long. 125–170 μ ; lat. prope bas. semicell. 12·5–14 μ ; lat. prope apic. 8–10 μ .

I. Oorid Lough.—II. Cromagloun.

†Var. POLONICUM, *nob.* [P. (*Docidium* ?) *polonicum*, *Racib.* (*l. c. f. 12.*)].

Long. 145–165 μ ; lat. prope bas. semicell. 12·5–15 μ ; lat. isthm. 10–11 μ ; lat. prope apic. 5–6 μ .

II. Cromagloun.

The Irish forms of the last four varieties are all of somewhat larger dimensions than the originals. After examining a very large number of examples from near Cromagloun, I do not consider that *P. polonicum*, *Racib.*, is a distinct species, as forms were noticed connecting it with var. *alpinum*, *Racib.*

††Var. CRASSUM, nov. var. (Pl. XX. fig. 1.)

Var. diametro $4\frac{1}{2}$ plo longius, apices versus attenuata, lateribus subrectis, constrictione distincta sed levi.

Long. 71–85 μ ; lat. prope bas. semicell. 16–18 μ ; lat. isthm. 13–14 μ ; lat. prope apic. 12·5 μ .

I. Ballynahinch; Nacoogarrow Lough.—II. Adrigole; Car-rantuohill.

††Var. CRASSUM, nov. var., f. PUNCTATA. (Pl. XX. fig. 2.)

Membrana distincte punctata.

Long. 77 μ ; lat. prope bas. semicell. 18 μ ; lat. ad apic. 13 μ .

I. Ballynahinch.

††Var. CRASSUM, nov. var., f. INFLATA. (Pl. XX. fig. 3.)

F. diametro $3\frac{1}{4}$ –4plo longius; semicellulis distincte inflatis.

Long. 65–80 μ ; lat. prope bas. semicell. 20–21 μ ; lat. prope apic. 13·5–15 μ .

This totally differs from var. *tumidum*, Wille, in its relatively greater thickness.

I. Ballynahinch.

††Var. UNDULATUM, nov. var. (Pl. XX. fig. 4.)

Var. semicellulis regulariter sed leve 5-undulatis utrobique.

Long. 101 μ ; lat. prope bas. semicell. 12·5 μ ; lat. prope apic. 9 μ .

II. Cromagloun.

1. CYLINDROCYSTIS BRÉBISSEONII, *Menegh.* [Penium Brebissonii, *Ralfs, Desm.* p. 153, tab. 25. fig. 6.]

I. Moher Lough; Ballynahinch; Lough Shannaclontippen.—II. Lough Guitane; Upper Lake of Killarney; Carrantuohill; Sugar Loaf Mt.

2. C. DIPLOSPORA, *Lund.* (*Desm. Succ.* p. 83, tab. 5. fig. 7.)

I. Arderry Lough; Ballynahinch; Lough Shannaclontippen; Nacoogarrow Lough.—II. Cromagloun.

††* MAJOR, nov. subsp. (Pl. XX. fig. 5.)

C. permagna, diametro duplo longior, medio non constricta sed subplana, utroque polo rotundata; a vertice visa circularis; membrana achroa, glabra.

Long. 102 μ ; lat. 48 μ .

I. Lakes, Clifden to Roundstone.

3. C. CRASSA, *De Bary.* [Penium rupestre, *Rabh. Fl. Europ. Alg.* iii. p. 120.]

Long. 22–29 μ ; lat. 18–20 μ .

I. Kylemore; Ballynahinch.—II. Carrantuohill; near Lough Brin.

†1. MESOTÆNIUM MICROCOCCUM, *Kirchn.* [Palmogloea micrococca, *Kuetz.*]

Long. 12–15 μ ; lat. 6·5–8·5 μ .

I. Lakes, Clifden to Roundstone.—II. 8 m. S. of Kenmare.

2. M. CHLAMYDOSPORUM, *De Bary.* (*Cooke, Brit. Desm.* p. 47, tab. 18. fig. 4.) (Pl. XXIV. fig. 8.)

Long. 16–21 μ ; lat. 8·5–10 μ ; diam. matur. zygosp. 16–25 μ .

I. Near Westport.

3. M. DE-GREYII, *W. Turn.* (*Naturalist*, 1886, p. 34, tab. 1. fig. 1.)

II. Castletown.

††Var. BEEVE, nov. var. (Pl. XX. fig. 6.)

Hæc varietas multum brevior est quam forma typica.

Long. 58 μ ; lat. 21–22 μ .

II. On dripping rocks with *Amphoridium Mougeotii* and other mosses, Torc Mt.

1. TETMEMORUS BRÉBISSEONII, *Ralfs.* (*Brit. Desm.* p. 145, tab. 24. fig. 1.)

Long. 155–162 μ ; lat. 30–33 μ ; lat. isthm. 22–25 μ .

I. Near Westport; Aunierin, Shindilla, Creggan, and Shanna-cloontippen Loughs; Lakes near Recess; near Oughterard; Ballynahinch; Roundstone; Clifden.—II. Cromagloun; Carrantuohill; Sugar Loaf Mt.; Glengarriiff; Lower Lake of Killarney; Castletown; Adrigole.

Var. MINOR, *De Bary*.

Long. 57 μ ; lat. 15 μ ; lat. isthm. 11 μ .

I. Near Oughterard; Lakes near Recess; Clifden.—II. Near Lough Brin.

2. TETMEMORUS GRANULATUS, *Ralfs*. (*Brit. Desm.* p. 146, tab. 24. fig. 3.)

Long. 138–238 μ ; lat. 30–45 μ ; lat. isthm. 25–40 μ .

I. Near Westport; Ballynahinch (cum zygosp.); Roundstone; Athry, Creggan, Arderry, Aunierin, Oorid, Shanna-cloontippen, Shindilla, and Derryclare Loughs; Lakes E. of Lough Bofin; Kylemore; near Oughterard.—II. Tore Mt.; Cromagloun; Carrantuohill; Loughs Cloonee and Guitane; Adrigole; Glengarriiff; Upper and Lower Lakes of Killarney; Glen Caragh; Castletown; near Lough Brin; Sugar Loaf Mt.; Clogerheen; 8 m. S. of Kenmare.

†Forma MINOR, *Nord*. (*Alg. Sandvic.* p. 10).

Long. 95–100 μ ; lat. 21–23.5 μ .

I. Ballynahinch.

††Var. ATTENUATUS, nov. var. (Pl. XX. fig. 7.)

Var. apicibus attenuatis et subconstrictis.

Long. 170–182 μ ; lat. ad bas. semicell. 30 μ ; lat. isthm. 22–25 μ ; lat. ad apic. 15–17 μ ; lat. sub apic. 15 μ .

I. Lough Aunierin; near Oughterard; Ballynahinch; Lakes, Clifden to Roundstone.—II. Lough Guitane; Castletown; Lower Lake of Killarney; Tore Mt.

3. T. LÆVIS, *Ralfs*. (*Brit. Desm.* p. 147, tab. 24. fig. 2.)

I. Ballynahinch; Kylemore; near Oughterard; Lakes east of Lough Bofin; Clifden.—II. Cromagloun; Carrantuohill; Adrigole; near Lough Brin; Glen Caragh; Lower Lake of Killarney.

1. SPIROTÆNIA CONDENSATA, *Bréb. in Ralfs, Brit. Desm.* p. 179, tab. 34. fig. 1.

Long. 270 μ ; lat. 27 μ .

I. Lakes, Clifden to Roundstone; near Leenane; near Oughterard.—II. Lough Guitane; Glengarriff; Lower Lake of Killarney; Cloonee Lough; Castletown.

†+2. S. BISPIRALIS, nov. sp. (Pl. XX. fig. 8.)

Sp. fasiformis, in gelatina matricale nidulans, diametro 5plo longior, apicibus subtruncatis, massa chlorophyllacea in fasciis spiralibus gracilibus duobus, anfractibus densis circiter novem.

Long. 86–100 μ ; lat. max. 18–20 μ ; lat. apic. 4–6 μ .

I. Near Westport.

This species differs from *S. condensata*, Bréb., in having two slender spirals and in its subtruncate ends. It is distinguished from *S. obscura*, Ralfs, in the definite number of spirals and in the widely different number of revolutions.

3. S. OBSCURA, *Ralfs.* (*Brit. Desm.* p. 179, tab. 34. fig. 2.)

II. Near Lough Brin.

1. MICRASTERIAS MUCRONATA, *Rabh.* (*Fl. Europ. Alg.* iii. p. 187.)

I. Kylemore.

2. M. PINNATIFIDA, *Ralfs.* (*Brit. Desm.* p. 77, tab. 10. fig. 3.)

Long. 53–61 μ ; lat. 57–65 μ ; lat. isthm. 12.5–17 μ .

I. Ballynahinch; Lough Aunierin; Creggan Lough; Athry Lough; Moher Lough.—II. Adrigole.

A form of this from Ballynahinch was occasionally met with which had the basal lobes of each semicell distinctly and regularly tridentate. (Pl. XX. fig. 9.)

3. M. FURCATA, *Ag.* (*Ralfs, Brit. Desm.* p. 73, tab. 9. fig. 2.)

Long. 160–170 μ ; lat. 145–187 μ ; lat. isthm. 20–25 μ .

I. Derryclare Lough; Lakes, Clifden to Roundstone; Glendalough.

4. M. CRUX-MELITENSIS, *Ralfs.* (*Brit. Desm.* p. 73, tab. 9. fig. 3.)

Long. 117–120 μ ; lat. 107–110 μ ; lat. isthm. 19 μ .

I. Creggan Lough; Ballynahinch; Lakes near Recess.

5. *MICRASTERIAS AMERICANA*, *Ralfs in Brit. Desm.* p. xix (errata et addenda), tab. 10. fig. 1.

II. Carrantuohill.

6. *M. DENTICULATA*, *Bréb.* (*Ralfs, Brit. Desm.* p. 70, tab. 7. fig. 1.)

Long. 205–235 μ ; lat. 185–192 μ ; lat. isthm. 31–40 μ .

I. Near Leenane; near Westport; Derryclare Lough; Creggan Lough; Nacoogarrow Lough; Ballynahinch; Lough Aunierin; Kylemore; near Oughterard; Roundstone; near Recess.—II. Carrantuohill; Glengarriff; Castletown.

7. *M. ROTATA*, *Ralfs.* (*Brit. Desm.* p. 71, tab. 8. fig. 1.)

Long. 220–240 μ ; lat. 195–220 μ ; lat. isthm. 35–40 μ .

I. Near Westport; near Oughterard; Lakes, Clifden to Roundstone; Nacoogarrow Lough; Ballynahinch; Kylemore; Creggan Lough; Lough Aunierin.—II. Cromagloun; Tore Mt.; Sugar Loaf Mt.; Glen Caragh; Glengarriff; Castletown; Clogherheen.

††Forma GRANULATA.

F. membrana irregulariter sparsimque sed distinctissime granulata.

I. Lough Aunierin.

8. *M. THOMASIANA*, *Arch.* (*Rabh. Alg. Europ.* 1868, p. 192.)

II. Glen Caragh; Cloonee Lough.

††Forma MAJOR.

Long. 315 μ ; lat. 285 μ ; lat. isthm. 38 μ .

I. Arderry Lough.

The specimens observed only differed from the type in being about half as large again.

The following dimensions show the relative breadth and length of specimens observed from various parts of the British Isles:—

Arderry Lough, Connemara	lat. : long. = 1 : 1.105.
Glen Shee, Perthshire	„ = 1 : 1.266.
Wrynose, Lake District	„ = 1 : 1.200.
Mr. W. Archer's original speci- } mens from Ireland }	„ = 1 : 1.129.

9. *M. RADIOSA*, *Ag.* (*Ralfs, Brit. Desm.* p. 72, tab. 8. fig. 3.)

Long. 150 μ ; lat. 130 μ ; lat. isthm. 30 μ .

I. Derryclare Lough.

10. MICRASTERIAS PAPILLIFERA, *Bréb. in Ralfs, Brit. Desm.* p. 72, tab. 9. fig. 1.

Long. 135–145 μ ; lat. 115–145 μ ; lat. isthm. 15 μ .

I. Ballynahinch; near Westport; Creggan Lough; Derryclare and Moher Loughs.—II. Glengarriff; Cloonee Lough; Castletown; Adrigole.

†Var. GLABRA, *Nord. in Nord. et Wittr. Alg. Exsic.* no. 466.

I. Ballynahinch.

†Var. GLABRA, *Nord.*, ††forma INFLATA. (Pl. XX. fig. 10.)

Forma semicellulis inflatione ad basin instructis.

Long. 84 μ ; lat.=long.; lat. isthm. 15 μ ; crass. 29 μ .

I. Ballynahinch.

11. M. TRUNCATA, *Bréb. in Ralfs, Brit. Desm.* p. 75, tab. 8. fig. 4, tab. 10. fig. 5.

Long. 100–110 μ ; lat. 90–108 μ ; lat. isthm. 20–27 μ .

I. Near Westport; Ballynahinch; Kylemore; Creggan, Shindilla, Arderry, Oorid, and Derryclare Loughs; Roundstone; near Oughterard; Lough Aunierin; near Recess.—II. Cromagloun Muckross; Carrantuohill; Glen Caragh; Castletown; near Lough Brin; Glengarriff.

†Forma GRANULATA, *Racib. (Desm. Nov. 1889, p. 26.)*

I. Ballynahinch; Athry Lough.

††Forma PUNCTATA.

Forma membrana insigniter punctata.

Long. 50 μ ; lat.=long.; lat. isthm. 30 μ .

I. Near Oughterard; Nacoogarrow Lough.—II. Lough Guitane.

12. M. CRENATA, *Bréb. in Ralfs, Brit. Desm.* p. 75, tab. 7. fig. 2, tab. 10. fig. 4.

I. Kylemore; Lakes, Clifden to Roundstone.

13. M. JENNERI, *Ralfs. (Brit. Desm. p. 76, tab. 11. fig. 1.)*

Long. 162–165 μ ; lat. 105–117 μ ; lat. isthm. 33 μ .

I. Kylemore.—II. Carrantuohill.

Var. SIMPLEX, *West. (Fr. Wat. Alg. of N. Wales, in Journ.*

R. Micr. Soc. April 1890, p. 287, pl. vi. fig. 34.) [M.

Jenneri, *Ralfs*, f. Brasiliensis, *Boerg.* (*Desm. Brasil.* p. 936, tab. 2. fig. 11).]

Long. 150 μ ; lat. 100 μ ; lat. isthm. 25 μ .

I. Ballynahinch.

1. EUASTRUM VERRUCOSUM, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 79, tab. 11. fig. 2.)

Long. 93–110 μ ; lat. 75–86 μ ; lat. isthm. 22 μ .

I. Creggan, Boy, Shannaclontippen, and Derryclare Loughs; Lough Aunierin; Lakes, Clifden to Roundstone, and near Recess; near Westport; Lakes E. of Lough Bofin.—II. Lough Guitane; Glengarriff; Cloonee Lough; Muckcross; Adrigole.

†Var. COARCTATUM, *Delp.*, forma. (Pl. XX. fig. 11.)

A form of this is figured which has the intermediate lobules of the semicells very short, with the subapical sinus wider and shallower.

Long. 90 μ ; lat. ad bas. semicell. 76 μ ; lat. pol. lob. 32.5 μ ; lat. isthm. 21 μ .

I. Derryclare Lough.

Compare with *E. verrucosum*, *Ehrnb.*, *reductum*, *Nord.* (*De Alg. et Char.* i. p. 9, tab. 16. fig. 14).

†Var. ALATUM, *Wolle.* (*Desm. U.S.* p. 101, tab. 26. fig. 4.)

II. Cloonee Lough.

2. E. OBLONGUM, *Ralfs.* (*Brit. Desm.* p. 80. tab. 12.)

Long. 144–167 μ ; lat. 80–83 μ ; lat. isthm. 20–26 μ ; crass. 52 μ .

I. Near Westport; Lakes, Clifden to Roundstone, and E. of Lough Bofin; near Oughterard; Ballynahinch; Derryclare Lough.—II. Lough Guitane; Cromagloun; Tore Mt.; Muckcross; Glengarriff; Castletown; Carrantuohill; Glen Caragh.

3. E. CRASSUM, *Kuetz.* (*Ralfs, Brit. Desm.* p. 81, tab. 11. fig. 3.)

Long. 167–185 μ ; lat. 87–97 μ ; lat. isthm. 24–27 μ .

I. Ballynahinch; Kylemore; Lough Aunierin; Oorid Lough; Arderry Lough; near Oughterard.—II. Cromagloun; Tore Mt.; Muckcross; Carrantuohill; Glen Caragh; Sugar Loaf Mt.; Glengarriff; Upper Lake of Killarney; Castletown.

†Var. SCROBICULATUM, *Lund.* (*Desm. Suec.* p. 18, tab. 2. fig. 1.)

II. Cromagloun.

4. *EUASTRUM PINNATUM*, *Ralfs*. (*Brit. Desm.* p. 81, tab. 13. fig. 1.)

Long. 132–144 μ ; lat. 70–77 μ ; lat. isthm. 22–24 μ ; crass. 47–50 μ .

I. Roundstone; Ballynahinch; Lough Aunierin; Lough Shindilla.—II. Castletown; Carrantuohill.

5. *E. HUMEROSUM*, *Ralfs*. (*Brit. Desm.* p. 82, tab. 13. fig. 2.)

II. Lough Guitane; Carrantuohill.

6. *E. VENTRICOSUM*, *Lund*. (*Desm. Suec.* p. 18, tab. 2. fig. 2.)

Long. 115 μ ; lat. 63 μ ; lat. isthm. 28 μ ; crass. 33 μ .

I. Ballynahinch; Kylemore; Lakes near Recess.—II. Carrantuohill.

7. *E. AFFINE*, *Ralfs*. (*Brit. Desm.* p. 82, tab. 13. fig. 3.)

I. Near Westport; near Oughterard; Lough Aunierin; Ballynahinch.—II. Castletown.

8. *E. AMPULLACEUM*, *Ralfs*. (*Brit. Desm.* p. 83, tab. 13. fig. 4.)

Long. 110 μ ; lat. 58 μ ; lat. isthm. 17.5 μ .

I. Kylemore; near Oughterard; Roundstone; Oorid Lough; Lakes, Clifden to Roundstone.—II. Cromagloun; Torc Mt.; Glen Caragh; Carrantuohill; Castletown; 8 m. S. of Kenmare.

9. *E. INSIGNE*, *Hass*. (*Ralfs, l. c.* p. 83, tab. 13. fig. 6.)

II. Cromagloun; Glen Caragh; Torc Mt.

10. *E. DIDELTA*, *Ralfs*. (*Brit. Desm.* p. 84, tab. 14. fig. 1.)

Long. 130–195 μ ; lat. 70–75 μ ; lat. isthm. 16 μ ; crass. 42–45 μ .

I. Near Westport; near Oughterard; Loughs Aunierin, Nacoogarrow, Shindilla, and Shannaclontippen; Ballynahinch.—II. Cromagloun; Lough Guitane; Torc Mt.; Upper Lake of Killarney; Carrantuohill; Adrigole; Glengarriff; Glen Caragh; Castletown.

11. *E. CUNEATUM*, *Jenner, in Ralfs, Brit. Desm.* p. 90, tab. 32. fig. 3.

Long. 125 μ ; lat. 58 μ ; lat. isthm. 22 μ .

I. Near Oughterard.—II. Carrantuohill.

12. *EUASTRUM ANSATUM*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 85, tab. 14. fig. 2.)

Long. 72–86 μ ; lat. 32–42 μ ; lat. isthm. 12–15 μ .

I. Athry, Derryclare, Aunierin, and Shannaclontippen Loughs; Lakes, Clifden to Roundstone; near Oughterard; Clifden; Ballynahinch; near Westport; Kylemore.—II. Clogherbeen; Cromagloun; Lough Guitane; Glen Caragh; Castletown; Sugar Loaf Mt.; Glengarriff; Upper and Lower Lakes of Killarney; near Lough Brin; 8 m. S. of Kenmare.

13. *E. CIRCULARE*, *Hass.* (*Ralfs, l. c.* p. 85, tab. 13. fig. 5.)

I. Nacoogarrow Lough.—II. Lough Guitane; Upper Lake of Killarney; Carrantuohill.

14. *E. SINUOSUM*, *Lenorm.* (*Ralfs, Brit. Desm.* p. 85.)

Long. 56–57 μ ; lat. 35 μ ; lat. isthm. 9–10 μ ; crass. 21 μ .

I. Ballynahinch; Lough Shannaclontippen.—II. 8 m. S. of Kenmare.

15. *E. PECTINATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 86, tab. 14. fig. 5. (Pl. XXIV. fig. 7.)

Long. 55–62 μ ; lat. 33–35 μ ; lat. isthm. 10–12.5 μ ; crass. 21–23 μ ; long. zyg. cum spin. 57 μ ; long. zyg. sine spin. 50 μ ; lat. zyg. cum spin. 46 μ ; lat. zyg. sine spin. 35 μ .

I. Arderry, Athry, Baheh, Shindilla, Creggan, Derryclare, Aunierin, Shannaclontippen, Boy and Nacoogarrow Loughs; Ballynahinch (cum zygosp.); Glendalough; Kylemore; Lakes, Clifden to Roundstone; near Westport; Roundstone; Lakes E. of Lough Bofin.—II. Upper and Lower Lakes of Killarney; near Lough Brin; Sugar Loaf Mt.; Glengarriff; Tore Mt.; Castletown; Cromagloun; Lough Guitane; 8 m. S. of Kenmare.

16. *E. GEMMATUM*, *Bréb.* (*Ralfs, Brit. Desm.* p. 87, tab. 14. fig. 4.)

Long. 52–70 μ ; lat. 38–47 μ ; lat. isthm. 12–13 μ ; crass. 30 μ .

I. Ballynahinch; Creggan Lough; Aunierin and Moher Loughs; near Westport.—II. Glengarriff; Castletown.

17. *E. BOSTRATUM*, *Ralfs.* (*Brit. Desm.* p. 88, tab. 14. fig. 6.)

Long. 32–34 μ ; lat. 23–25 μ ; lat. isthm. 6–7.5 μ .

I. Derryclare, Moher, and Shannaclontippen Loughs; Roundstone; near Westport.—II. Sugar Loaf Mt.

18. *EUASTRUM ELEGANS*, *Kuetz.* (*Ralfs, Brit. Desm.* p. 89, tab. 14. fig. 7.) *Forma*, Pl. XX. fig. 12.

I. Arderry, Nacoogarrow, Letereen, Athry, Boy, Creggan, Derryclare, Aunierin, Shannacloontippen, and Moher Loughs; Ballynahinch; Clifden; Glendalough; near Oughterard; near Recess; Roundstone; near Westport; Lakes E. of Lough Bofin.—II. Loughs Guitane and Cloonee; Cromagloun; Muckcross; Torc Mt.; Carrantuohill; near Lough Brin; Adrigole; Castletown; Upper and Lower Lakes of Killarney.

Var. *BIDENTATA*, *Naeg.* [? *E. elegans*, *Kuetz.*, β . specimen, *Boldt.* (*Desm. Grönl.* p. 7, tab. 1. figs. 10 & 11).]

I. Creggan Lough; Lakes E. of Lough Bofin; near Oughterard.

†19. *E. PICTUM*, *Boerg.* (*Desm. Brasil.* p. 939, tab. 3. fig. 19.)

I. Oorid Lough; Arderry Lough; Lakes near Recess.—II. Glen Caragh; Lough Guitane; Castletown; Carrantuohill.

20. *E. INERME*, *Lund.* (*Desm. Succ.* p. 20, tab. 2. fig. 3.)

Long. 50–60 μ ; lat. 30–32.5 μ ; lat. isthm. 7.5–8 μ ; crass. 20 μ .

I. Athry, Aunierin and Derryclare Loughs; Ballynahinch.—II. Castletown; Glengarriff.

††21. *E. PYRAMIDATUM*, *nov. sp.* (Pl. XX. fig. 13.)

E. parvum, diametro subduplo longius, profunde constrictum, sinu lineari extremo ampliato, semicellulæ pyramido-truncatæ, lateribus concavis apicem versus, undulis duabus levissimis prope basin, subemarginatæ apice; a vertice visæ rhomboideæ, angulis rotundatis et lateribus convexis; a latere visæ trigonopyramidatæ, lateribus concavis; membrana lævis; pyrenoidibus singulis.

Long. 25–27 μ ; lat. ad bas. semicell. 16–18 μ ; lat. ad apic. 9–10 μ ; lat. isthm. 3.5–4 μ ; crass. 12.5 μ .

I. Ballynahinch; Kylemore; Roundstone.

Compare with *Cosmarium sublobatum* (Bréb.), Arch.

22. *E. BINALE*, *Ralfs.* (*Brit. Desm.* p. 90, tab. 14. fig. 8.)

I. Ballynahinch; Creggan Lough; Kylemore; near Recess; Lough Shindilla; Lough Aunierin; Lough Shannacloontippen; near Oughterard; near Westport.—II. Lough Guitane; Upper

Lake of Killarney; Carrantuohill; Lower Lake of Killarney; Adrigole; Glen Caragh; Glengarriff.

Forma MINOR, *West*. (*Desm. Maine, in Journal of Bot.* Nov. 1888.)

I. Lakes, Clifden to Roundstone; Ballynahinch; Roundstone; Athry Lough.

††Forma HIANS. (Pl. XX. fig. 14.)

Forma sinu lato rectangulari repente angusto extremo leviter ampliata.

Long. 11 μ ; lat. 10–11 μ ; lat. isthm. 2.5–3 μ ; crass. 6 μ .

I. Ballynahinch; Lakes near Recess.

Var. ELOBATUM, *Lund*. (*Desm. Suec. p. 23, tab. 2. fig. 7.*)

I. Ballynahinch; Derryclare Lough.

Var. INSULARE, *Wittr.* (*Om Gotl. och Ol. Sötv. p. 49, tab. 4. fig. 7.*)

II. Lower Lake of Killarney.

††*SUBELOBATUM, nov. subsp. (Pl. XX. fig. 15.)

E. parvum, diametro $1\frac{1}{2}$ plo longius, profunde constrictum, sinu lineari extremo ampliata; semicellulæ trapezoidæ, angulis inferioribus rectangularibus biundulatis, lateribus superioribus convergentibus uniundulatis, late emarginatæ apice; a vertice visæ undulato-rhomboidæ; a latere visæ subrotundæ, papilla mediana apice lateribusque; membrana glabra.

Long. 26 μ ; lat. 18 μ ; lat. isthm. 5 μ ; crass. 12.5 μ .

I. Lough Aunierin.—II. Lough Guitane.

†23. EUASTRUM CRASSANGULATUM, *Boerg.* (*Desm. Brasil. p. 942, tab. 3. fig. 25.*)

††Var. ORNATUM, nov. var. (Pl. XX. fig. 16.)

Semicellulæ granulis sex medio (quinque annulo circa granulum centrale) et granulis sex intra ambitum.

Long. 27 μ ; lat. 17.5 μ ; lat. isthm. 4.5 μ ; crass. 14 μ .

I. Ballynahinch.

24. *E. DENTICULATUM*, *Gay.* (*Sur les Conj. du Midi de la France, 1884, p. 335.*)

Long. 17–21.5 μ ; lat. 15–20 μ ; lat. isthm. 4–6.5 μ ; crass. 14 μ .

I. Creggan Lough; near Recess; near Westport; Moher, Boy, Aunierin, Shannacloontippen, and Shindilla Loughs; Glen-

dalough; Ballynahinch; Athry Lough; Lakes, Clifden to Roundstone, and E. of Lough Bofin.—II. Muckcross; Lough Guitane; Adrigole; Carrantuohill; Upper Lake of Killarney; near Lough Brin; Glen Caragh; Cloonee Lough; Glengarriff.

††Var. GRANULATUM, nov. var. (Pl. XX. fig. 17.)

Semicellulæ granulis tribus (nec quinque) medio basin versus; membrana granulatiore; angulis superioribus sine dentibus acutis.

Long. 18 μ ; lat. 18 μ ; lat. isthm. 4 μ ; crass. 9 μ .

I. Ballynahinch.

††25. EUASTRUM TURNERII, nov. sp. (Pl. XX. fig. 18.)

E. subparvum, diametro $1\frac{1}{2}$ plo longius, profunde constrictum, sinu lineari extremo ampliato; semicellulæ trapezoidæ quinquelobæ, lobo polari undulis parvis quatuor, anguste inciso, spino divergente ad angulos papilla, infra spinam, lobis lateralibus truncato-emarginatis; membrana granulata glabra medium versus, projectione mediana granulata ad apicem; a vertice visæ ellipticæ (projectione mediana conspecta); a latere visæ triangulato-ovata apiculatæ.

Long. 50 μ ; lat. ad bas. semicell. 33 μ ; lat. poll. lob. 23 μ ; lat. isthm. 9 μ ; crass. 20 μ .

I. Derryclare Lough.

E. sp. "ad *E. denticulatum*, Gay, accedens," Nordst. (Fr. Wat. Alg. of New Zeal. and Austr. p. 35, pl. 3. fig. 11), is evidently a form of this species.

Compare with *E. abruptum*, Nord. (Desm. Brasil. tab. 2. fig. 3), β . *evolutum*, Nord. (Nonnullæ Algæ Brasil. p. 21, tab. 2. fig. 7).

Named in honour of my able friend Mr. W. B. Turner, F.R.M.S., &c.

††26. *E. SCRITUM*, nov. sp. (Pl. XXIV. fig. 13.)

E. submediocre, tertia parte longius quam latius, ambitu profunde crenatum, truncato-ellipticum, profunde constrictum, sinu lineari angusto extremo ampliato; semicellulæ semicirculares, margine laterali unoquoque 4-crenata (duobus in medio parvioribus), crenis granulatis, apice late inciso; a vertice visæ ellipticæ, inflatione mediana truncata; a latere visæ quadrato-oblongæ, inflatione truncata ad basin.

Long. 42 μ ; lat. 31 μ ; lat. isthm. 8.5 μ ; crass. 18 μ .

II. Carrantuohill.

Compare with *Cosmarium nasutum*, Nord. (Desm. Spetsb. p. 33, tab. 7. fig. 17).

1. *COSMARIUM QUADRATUM*, *Ralfs*. (*Brit. Desm.* p. 92, tab. 15. fig. 1.)

Long. 50–52 μ ; lat. 30 μ ; lat. isthm. 12–13 μ .

I. Near Westport; Lakes, Clifden to Roundstone; Lough Aunierin.—II. Carrantuohill.

2. *C. Plicatum*, *Reinsch*, †† var. *HIBERNICUM*, nov. var. (Pl. XXIV. fig. 9.)

Var. *leviter constricta* infra, apicibus convexis, membrana punctata.

Long. 90 μ ; lat. 47 μ ; lat. isthm. 18 μ .

II. Carrantuohill.

3. *C. SINUOSUM*, *Lund*, † var. *DECEDENS*, *Reinsch*. (*Nord. Desm. Arct.* tab. 8. fig. 41.)

II. Carrantuohill.

†4. *C. TATRICUM*, *Racib.* (*De nonnul. Desm. Polon.* p. 22. tab. 1. fig. 12.)

†† Var. *SPHÆRULIFERUM*, nov. var. (Pl. XX. fig. 11.)

Var. *major quam forma typica*; *semicellulæ granulis 10 levibus* (sed *distinctis*), cum 7 *intra ambitum regulariter dispositis*, tribus *reliquis prope isthmum*; *cellulæ a latere conspectæ distincte constrictæ*.

Long. 45 μ ; lat. ad bas. *semicell.* 25 μ ; lat. ad apic. 18.5 μ ; lat. isthm. 15 μ ; *crass.* 14 μ .

I. Lough Shannaclontippen.

In having the lateral view constricted it agrees with the var. *novizelandicum*, Nord. (*Fr. Wat. Alg. of New Zeal. and Austr.* p. 56, tab. 6. fig. 6), which is also larger than the type.

5. *C. NYMANNIANUM*, *Grun. in Rabh. Fl. Europ. Alg.* iii. p. 166.

I. Oorid Lough.—II. Glen Caragh; Castletown; Lower Lake of Killarney.

6. *C. HAMMERI*, *Reinsch*. (*C. homalodermum*, *Nord.*)

Long. 50 μ ; lat. 35 μ ; lat. isthm. 13 μ .

I. Creggan Lough; Derryclare Lough; Clifden; Lakes, Clifden to Roundstone; Lough Aunierin; Nacoogarrow Lough; Boy Lough.

†7. *COSMARIUM EDUCTUM*, *Roy et Biss. in Nord. Desmideer från Bornholm*, p. 198, tab. 6. fig. 8.

††Var. *ANGUSTATUM*, nov. var. (Pl. XX. fig. 20.)

Var. minor, apicibus angustioribus, constrictione profundiore; membrana delicatissima sed distincte punctata.

Long. $30\ \mu$; long. partis productæ $3\cdot5\text{--}4\ \mu$; lat. max. $21\cdot5\ \mu$; lat. sub apic. $14\ \mu$; lat. apic. $11\text{--}12\cdot5\ \mu$; lat. isthm. $6\cdot5$.

I. Ballynahinch.

The faintly undulate lateral margins of this Irish form are intermediate between the figs. 8 a and 8 b (Nordst. l. c.).

8. *C. HOLMIENSE*, *Lund. (Desm. Suec. p. 49, tab. 2. fig. 20.)*

I. Near Oughterard.—II. Glen Caragh.

9. *C. ANCEPS*, *Lund. (Desm. Suec. p. 48, tab. 3. fig. 4.)*

I. Ballynahinch; Lough Aunierin.

10. *C. GRANATUM*, *Bréb. in Ralfs, Brit. Desm. p. 96, tab. 32. fig. 6.*

Long. $37\text{--}42\ \mu$; lat. ad bas. semicell. $23\cdot5\text{--}27\cdot5\ \mu$; lat. ad apic. $7\cdot5\text{--}8\cdot5\ \mu$; lat. isthm. $7\cdot5\ \mu$; crass. $15\text{--}17\cdot5\ \mu$.

I. Ballynahinch; Roundstone; near Recess; Creggan Lough; Lough Aunierin; Boy, Shindilla, and Nacoogarrow Loughs; Lakes east of Lough Bofin; near Westport; Baheh Loughs; Letereen Lough.—II. Glen Caragh; Adrigole.

Forma ad var. *concauum*, Lagerh. (Contrib. a la Fl. Alg. del Ecuador, ii. p. 16), accedens, lateribus subconcauis.

I. Derryclare Lough.

†Var. *SUBGRANATUM*, *Nord. (Alg. aq. dulc. Sandvic. p. 13, tab. 2. fig. 8.)*

Long. $24\ \mu$; lat. $17\ \mu$; lat. isthm. $6\ \mu$.

I. Derryclare Lough.

11. *C. ANGUSTATUM*, *Nord. (Desm. Arct. p. 20.)* [Euastrum binale, *Ralfs*, var. *angustatum*, *Wittr. (Gotl. och Ol. Sötv. Alg. p. 50, tab. 4. fig. 8.)*—Euastrum polare, *Nord. (Desm. Spetsb. p. 37, t. 7. f. 24.)*]

II. Cloonee Lough.

†12. *C. TRILOBULATUM*, *Reinsch. (Alg. Fl. p. 116, tab. 9. fig. 6.)*

II. Cloonee Lough.

13. *COSMARIUM VARIOLATUM*, *Lund.* (*Desm. Succ.* p. 41, tab. 2. fig. 19.)

Long. 32–34 μ ; lat. 18–20 μ ; lat. isthm. 5–6 μ .

I. Athry Lough; Ballynahinch.

Forma apice levissime retuso.

Long. 29 μ ; lat. 16 μ ; lat. isthm. 5 μ .

I. Lakes, Clifden to Roundstone.

†14. *C. OBSOLETUM*, *Reinsch.* (*Alg. Fl.* p. 110, tab. 9. fig. 5.)

II. Clogherheen.

††Var. *ANGUSTATUM*, nov. var. (Pl. XXIV. fig. 22.)

Var. longius quam latum, semicellulæ subcirculares, marginibus lateralibus subrectis, leviter productæ ad basin, apicibus incrassatis.

Long. 42·5 μ ; lat. 34 μ ; lat. isthm. 11 μ .

II. Carrantuohill.

15. *C. PACHYDERMUM*, *Lund.* (*Desm. Succ.* p. 39, tab. 2. fig. 15.)

I. Lough Aunierin.

†16. *C. PERFORATUM*, *Lund.* (*Desm. Succ.* p. 40, tab. 2. fig. 16.)

Long. 60–75 μ ; lat. 57–60 μ ; lat. isthm. 26–32 μ .

I. Ballynahinch; Lakes east of Lough Bofin; Derryclare Lough; Lakes, Clifden to Roundstone.

17. *C. CIRCULARE*, *Reinsch.* (*Alg. Fl.* p. 108, tab. 10. fig. 2.)

Long. 90 μ ; lat. 75 μ ; lat. isthm. 25 μ .

I. Creggan Lough.

18. *C. PYRAMIDATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 94, tab. 15. fig. 4.

Long. 58–100 μ ; lat. 45–62 μ ; lat. isthm. 17·5–20 μ .

I. Near Westport; Ballynahinch; Athry Lough; Lough Shindilla; near Recess; Roundstone; Lakes, Clifden to Roundstone; Oughterard; Arderry Lough; Lough Aunierin; Creggan and Boy Loughs; Nacoogarrow Lough.—II. Tore Mt.; Lower Lake of Killarney; Glen Caragh; Castletown; Sugar Loaf Mt.; Glengarriff; Cloonee Lough; Adrigole.

19. *C. PSEUDOPYRAMIDATUM*, *Lund.* (*Desm. Succ.* p. 41, tab. 2. fig. 18.)

Long. 43–47 μ ; lat. 25–28 μ ; lat. isthm. 7–10 μ .

I. Athry Lough; Ballynahinch; Nacoogarrow Lough; Lakes, Clifden to Roundstone.—II. Muckross; Glen Caragh; Glen-garriff; Lower Lake of Killarney; Adrigole; Carrantuohill.

††Forma SUBRECTANGULARIS. (Pl. XX. fig. 21.)

Forma semicellulis subrectangularibus; a latere visis pyramido-oblongis.

Long. 59 μ ; lat. 30 μ ; lat. isthm. 10 μ .

I. Derryclare Lough.

20. COSMARIUM GALERITUM, *Nord.* (*Desm. Brasil.* 1869, p. 209, tab. 3. fig. 26.)

I. Creggan and Letereen Loughs.

21. C. NITIDULUM, *De Not.* (*Desm. Ital.* p. 42, tab. 3. fig. 26.)

I. Derryclare Lough; Kylemore; Lakes, Clifden to Roundstone.—Lough Guitane; Sugar Loaf Mt.

22. C. PSEUDONITIDULUM, *Nord.* (*Norges Desm.* (1873), p. 16. tab. 1. fig. 4.)

II. Adrigole.

†23. C. ELFVINGII, *Racib.* (*Nonnul. Desm. Polon.* p. 27.)
[C. hexagonum, *Elfv. non Nord.*]

I. Clifden.

24. C. PHASEOLUS, *Bréb.* (*Ralfs, Brit. Desm.* p. 106, tab. 32. fig. 5.)

I. Near Oughterard; Roundstone; Creggan and Nacoogarrow Loughs; Boy Lough; near Recess; Lakes, Clifden to Roundstone; Ballynahinch; Lough Aunierin.—II. Lough Guitane; Carrantuohill; Cloonee Lough; Adrigole; Mallow.

25. C. SCENEDESMUS, *Delp.* (*Desm. subalp.* p. 101, tab. 7. figs. 28–34.)

I. Near Westport; near Recess; Creggan Lough; Derryclare Lough; Nacoogarrow Lough; Lough Shannaclontippen; Boy and Oorid Loughs; Lakes east of Lough Bofin.—II. Muckross; Adrigole; Upper Lake of Killarney.

††Forma PUNCTATA.

F. membrana distincte punctata.

I. Derryclare Lough.

26. *COSMARIUM RECTANGULARE*, *Grun. in Rabh. Fl. Europ. Alg.* iii. p. 166. [*C. gotlandicum*, *Wittr. in Gotl. och Ol. Sötv. Alg.* p. 60, tab. 4. fig. 14.]

I. Ballynahinch; Nacoogarrow, Shindilla, Derryclare, and Letereen Loughs; Glendalough; Nabincka Lough.—II. Glen Caragh; Carrantuohill; Adrigole; Castletown; 8 m. S. of Kenmare.

27. *C. BIOCULATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 95, tab. 15. fig. 5.

I. Near Recess; Creggan Lough; Roundstone; Ballynahinch.—II. Lower Lake of Killarney; near Lough Brin; Mallow; Carrantuohill.

28. *C. TINCTUM*, *Ralfs. (Brit. Desm. p. 95, tab. 32. fig. 7.)*

Long. 10–13 μ ; lat. 7.5–9 μ ; lat. isthm. 4.5 μ ; crass. 5 μ ; diam. zygosp. 11–13 μ .

I. Ballynahinch; Roundstone (cum zygosp.); near Westport; Clifden; Lough Shannaclontippen; Derryclare Lough; Nacoogarrow Lough.—II. Upper and Lower Lakes of Killarney; Adrigole; Cloonee Lough; near Lough Brin; Glengarriff; Mallow.

††29. *C. SUCCISUM*, nov. sp. (Pl. XX. figs. 22, 23.)

C. parvum, tam longum quam latum, modice constrictum, sinu aperto cum extremo angusto et brevi; semicellulæ elliptico-hexagonæ, apice late truncatæ (nunquam subconcano); a vertice visæ subellipticæ, medio leviter subtumidæ; a latere visæ circulares; membrana lævis et fere rufescens; pyrenoidibus singulis.

Long. 10–12.5 μ ; lat. 11–12.5 μ ; lat. isthm. 3.75–5 μ ; crass. 6 μ .

I. Clifden; Creggan Lough; Derryclare Lough.

This species differs from *C. abbreviatum*, Racib. (*De nonn. Desm. Poloniae*, p. 27, tab. 1. fig. 13), in its rufescent membrane, its smaller size, its different sinus, its relatively greater length, and in the slight central swelling of the vertical view. It differs from *C. pseudobirenum*, Boldt. (*Siber. Chlor.* tab. 5. fig. 6), in having the apex more truncate, in the less swollen middle of the end view, in the different sinus, as well as in its smaller size.

30. *C. PYGMÆUM*, *Arch. [Sphærosoma pygmæum, Rabh. Fl. Europ. Alg.* iii. p. 150.] (Pl. XX. fig. 24.)

Long. 12·5–15 μ ; lat. 10–12·5 μ ; lat. isthm. 5 μ ; crass. 4·5–7·5 μ ; diam. zygosp. 12·5–15 μ .

I. Lough Aunierin (cum zygosp.).—II. Lough Guitane (cum zygosp.); near Lough Brin; Lower Lake of Killarney.

31. COSMARIUM TRUNCATELLUM, *Rabh.* (*Fl. Europ. Alg.* iii. p. 165.)

I. Moher Lough.

32. C. TENUE, *Arch.* (*Cooke, Brit. Desm.* p. 92.) (Pl. XX. fig. 25.)

Long. 14–16 μ ; lat. 13·5–15·5 μ ; lat. isthm. 3·5–4·5 μ ; crass. 8·5 μ ; diam. zygosp. 22–23 μ .

This agrees well with Archer's description of the species; it is about as long as broad and has a colourless membrane.

I. Lakes east of Lough Bofin (cum zygosp.); Derryclare Lough (cum zygosp.).

33. C. EXIGUUM, *Arch.* (*Rabh. Fl. Europ. Alg.* iii. p. 164.)

Long. 25–29 μ ; lat. 15–16 μ ; lat. isthm. 3–4 μ ; crass. 10 μ .

I. Athry Lough; Lough Aunierin; Lakes, Clifden to Roundstone; Lakes east of Lough Bofin; Ballynahinch; Derryclare Lough.—II. Carrantuohill; Castletown.

†34. C. IMPRESSULUM, *Elfv.* [*C. Meneghinii, Bréb., f. Reinschii, Istv. (Diag. Alg. Nov. Hung.* p. 8).—*C. Meneghinii, Bréb., forma, Reinsch (Contrib. Alg. et Fung.* p. 88, tab. 12. fig. 12 a et b).]

Long. 26–27 μ ; lat. 17–18 μ ; lat. isthm. 6–7 μ .

I. Ballynahinch; Bahéh Loughs; Lakes near Recess; Boy Lough; Moher Lough; Derryclare Lough; Nacoogarrow Lough; Glendalough; Shindilla Lough.—II. Lough Guitane.

† 35. C. VENUSTUM, *Arch. in Pritch. Infus.* ed. 1861, p. 732.

I. Near Westport; near Oughterard; Lakes, Clifden to Roundstone; Ballynahinch; Athry Lough; Arderry Lough.—II. Lough Guitane; Glen Caragh; Lower Lake of Killarney.

†Forma. MINOR, *Wille.* (*Ferskv. Alg. f. Nov. Seml.* p. 43.)

Long. 21 μ ; lat. 16 μ ; lat. isthm. 6 μ .

I. Bahéh Loughs.

††Var. HYPOHEXAGONUM, nov. var. (Pl. XXI. fig. 1.)

Semicellulæ truncato-pyramidatae, marginibus lateralibus in-

signite tricrenatis; membrana distincte callosa ad apicem incisuram parvarum et ad medium; a latere visæ late ovatæ.

Long. 36–38 μ ; lat. ad bas. semicell. 23–25 μ ; lat. ad apic. 17–18 μ ; lat. isthm. 7·5–8·5 μ ; crass. 16 μ .

I. Ballynahinch; Athry Lough.

The *Cosmarium venustum*, Arch. in Wolle's Desm. U. S. (p. 68, pl. 16. fig. 37), may be referred to a less crenate form of this variety. The thickening on the inside at the base of the notches makes this variety appear at first sight more deeply crenate than it really is.

††Var. HYPOHEXAGONUM, nov. var., f. INCRASSATA. (Pl. XXIV. fig. 23.)

Forma subtricrenata, membrana forte incrassata inter undulas.

Long. 25 μ ; lat. 20 μ ; lat. isthm. 5 μ ; crass. 11 μ .

I. Athry Lough.

††36. COSMARIUM PERPUSILLUM, nov. sp. (Pl. XXI. fig. 2.)

C. minutum, paulo longius quam latum, profundissime contractum, sinu lineari angusto, extremo ampliato; semicellulæ subhexagonæ, marginibus lateralibus superioribus triundulatæ (angulos includente), apice late truncatæ et subconcvæ; a vertice visæ ellipticæ; a latere visæ subquadrata, angulis rotundatis; membrana lævis; pyrenoidibus singulis.

Long. 11 μ ; lat. 9·5 μ ; crass. 5 μ .

I. Ballynahinch.

Compare with *C. Meneghinii*, Bréb., var. *nanum*, Wille (Ferskv. Alg. f. Nov. Seml. p. 43, tab. 13. fig. 37).

37. *C. MENEGHINII*, Bréb. in *Ralfs, Brit. Desm.* p. 96, tab. 15. fig. 6.

I. Moher Lough; near Recess; Lough Aunieriu; Derryclare and Nabincka Loughs; Lough Shindilla; Lakes east of Lough Bofin.—II. Lough Guitane; Cromagloun; Upper and Lower Lakes of Killarney; Carrantuohill; Kenmare; Glengarriff; Glen Caragh; Cloonee Lough; Mallow; 8 m. S. of Kenmare.

Forma OCTANGULARIS, Wille. (*Ferskv. Alg. från Nov. Seml.* p. 43, tab. 12. fig. 35.)

I. Creggan Lough; Ballynahinch; near Westport; Lakes E. of Lough Bofin.—II. Upper and Lower Lakes of Killarney; Cloonee Lough; Mallow.

†Var. NANA, *Wille*. (*Ferskv. Alg. från Nov. Seml.* tab. 13. fig. 37.)

II. Cromagloun.

†Var. WOLLEI, *Lagerh.* (*Desmid. aus Bengal.* p. 8.) [C. Meneghinii, *Wolle* (*Desm. U. S.* tab. 16. fig. 7, sinistra, superior).] (Pl. XXIV. fig. 18.)

Long. 15–17·5 μ ; lat. 11–13 μ ; lat. isthm. 3–4·5 μ .

I. Roundstone.—II. Cromagloun; Upper Lake of Killarney; Carrantuohill.

†38. COSMARIUM PROMINULUM, *Racib.* (*Nonn. Desm. Polon.* p. 23, tab. 2. fig. 7.)

II. Glen Caragh.

†39. C. CONCINNUM, *Reinsch*, var. LÆVE, *Wille*. (*Bidrag til Kunds. om Norges Ferskv. Alg.* p. 30, tab. 1. fig. 12.)

Long. 10–11 μ ; lat. 7·5–8 μ ; lat. isthm. 2–3 μ ; crass. 4–5 μ .

I. Derryclare Lough; Ballynahinch; Lakes E. of Lough Bofin.—II. Adrigole.

40. C. OBLIQUUM, *Nord.* (*Norges Desm.* p. 23, tab. 1. fig. 8.)

I. Creggan Lough; Lakes E. of Lough Bofin.—II. Carrantuohill.

††Var. TRIGONUM, nov. var. (Pl. XXIV. fig. 15.)

Semicellulæ a vertice visæ trigonæ, lateribus suberectis.

Long. 17·5 μ ; lat. 14 μ ; lat. isthm. 7·5 μ .

II. Carrantuohill.

41. C. REGNESII, *Reinsch.* (*Alg. Fl.* p. 112, tab. 7. fig. 8.)

Long. 13·5–14 μ ; lat. 12–13·5 μ ; lat. isthm. 4·5–6 μ .

I. Near Westport; Ballynahinch; Athry Lough; Roundstone; Clifden; Lough Shannacloontippen.—II. Upper Lake of Killarney; Carrantuohill; near Lough Brin; Adrigole; Cloonee Lough.

††Var. TRITUM, nov. var. (Pl. XXI. fig. 3.)

Hæc forma typica differt absentia dentium parvorum.

Long. 12·5 μ ; lat. 12 μ ; lat. isthm. 6 μ ; crass. 6 μ .

I. Creggan Lough; Kylemore.

42. C. SUBSTRIATUM, *Nord. in Witttr. et Nord. Alg. Exsic.* no. 977.

Pyrenoidibus singulis.

Long. 14–17 μ ; lat. 14–16 μ ; lat. isthm. 5 μ .

I. Lough Shannacloontippen; near Recess; Ballynahinch; Moher Lough; near Oughterard; near Westport; Lakes, Clifden to Roundstone; Creggan Lough; Derryclare Lough; Lakes east of Lough Bofin; Nabincka and Nacoogarrow Loughs; Roundstone; Boy Lough; Letereen Lough; Baheh Loughs; Glendalough; Lough Shindilla.—II. Lough Guitane; Upper and Lower Lakes of Killarney; Kenmare; Adrigole; Cloonee Lough.

††43. *COSMARIUM SUBDANICUM*, nov. sp. (Pl. XXI. fig. 4.)

C. parvum, circiter tam longum quam latum, incisura mediana profunda lineari (extremo ampliata); semicellulæ subtrapezicæ, lateribus subconvexis binis papillis brevissimis emarginatis instructæ, in apice truncato quinque crenis levissimis præditæ; a vertice visæ ellipticæ, medio leviter subtumidæ; a latere visæ subcirculares; membrana lævis; pyrenoidibus singulis.

Long. 17.5 μ ; lat. ad bas. semicell. 14 μ ; lat. ad apic. 11 μ ; lat. isthm. 4 μ ; crass. 8.5 μ .

I. Ballynahinch.

This is similar to *C. danicum*, Boerg. (Bidrag til Bornholms Desmidie-Flora, p. 145, tab. 6. fig. 6), but the sides differ in not having such a large subapical notch as well as in the lack of granules. It is also similar to *C. bipunctatum*, Boerg. (Desm. Brasil. p. 945, tab. 4. fig. 33), in outline, but differs in its margin, its smooth membrane, and in its faint monosubpapillate central protuberance.

44. *C. CRENATUM*, *Ralfs*. (*Brit. Desm.* p. 96, tab. 15. fig. 7.)

I. Oorid Lough.—II. Lough Guitane; Carrantuohill; Glen Caragh; Castletown; near Lough Briu; Cloonee Lough; 8 m. S. of Kenmare.

45. *C. SUBCRENATUM*, *Hantzsch*. (*Rabh. Fl. Europ. Alg.* iii. p. 164; *Nord. Desm. Arct.* p. 21, tab. 6. figs. 10, 11.)

Long. 33 μ ; lat. 30 μ ; lat. isthm. 11 μ .

II. Muckcross; Carrantuohill; Cloonee Lough.

†Var. *DIVARICATUM*, *Wille*. (*Ferskv. Alg. från Nov. Seml.* p. 40, tab. 12. fig. 27.)

Forma crenis lateralibus sub-bidentulatis, et granulæ semicellularum in series 3 verticales dispositæ.

I. Creggan Lough.

††46. COSMARIUM NUTTALLII, nov. sp. (Pl. XXI. fig. 5.)

C. mediocre, diametro circiter $1\frac{1}{2}$ plo longius, modice constrictum, sinu sublineari et introrsum ampliato; semicellulæ subsemiorbiculares, angulis inferioribus subrectangularibus in ambitu (10) undulatæ, granulis 4 intra utrumque marginem lateralem (uno sub utraque duarum inferiorum undularum et duobus sub undula tertia de basi), et 4 ad apicem (uno utroque parvo sinui, quarto infra granulum centralem); a vertice visæ subellipticæ, polis truncatis leviter tetraundulatis, medio inflatæ; a latere visæ quadrato-ovales, apice tetraundulatæ, inflatæ versus basin; isthmus a vertice visæ oblongo-truncatus; membrana dense et minute punctata, medio lævi et incrassato; pyrenoidibus binis.

Long. $45\ \mu$; lat. $32\ \mu$; isthm. $16 \times 11\ \mu$; crass. $23\ \mu$.

I. Ballynahinch; Athry Lough; Clifden.

This can be compared with its nearest ally *C. subundulatum*, Wille (Bg. til Kuuds. om Norges Ferskv. Alg. p. 27, tab. 1. fig. 9).

Named after my botanical companion in these and many other tours, Wm. Nuttall.

47. *C. UNDULATUM*, Corda. (*Alm. de Carlsbad*, 1839, p. 243, tab. 5. fig. 26; *Ralfs, Brit. Desm.* p. 97, tab. 15. fig. 8.)

I. Near Westport; Creggan Lough; Lough Aunierin; Lakes, Clifden to Roundstone.—II. Carrantuohill.

††Var. WOLLEI, nov. var. [*C. undulatum*, Corda, var. crenulatum, Wolle (*Desm. U. S.* p. 67, tab. 16. figs. 10, 19, 20), non Wittr. (*Anteckn. om Skand. Desm.* 1869, p. 11).]

I. Near Oughterard.

48. *C. MONOMAZUM*, Lund. (*Desm. Suec.* p. 32, tab. 3. f. 11.)

Var. POLYMAZUM, Nord. (*Sydl. Norges Desm.* p. 14, tab. 1. fig. 3.)

Long. $37.5\ \mu$; lat. $33-34\ \mu$; lat. isthm. $10-12\ \mu$; crass. $20\ \mu$.

I. Ballynahinch; Lough Aunierin.

49. *C. TETRAOPHTHALMUM*, Bréb. in *Ralfs, Brit. Desm.* p. 98, tab. 17. fig. 11, tab. 33. fig. 8.

Long. $103-111\ \mu$; lat. $72-77\ \mu$; lat. isthm. $18-23\ \mu$; crass. $48\ \mu$.

I. Creggan Lough; Lough Aunierin; Lough Shannacloon-tippen; Arderry Lough; Athry Lough; Derryclare Lough;

Bahch Loughs; Lakes, Clifden to Roundstone; Ballynahinch.—
II. Muckross; Kenmare; Lower Lake of Killarney.

†Var. LUNDELLII, *Wittr.* (*Gotl. och Ol. Stöv. Alg.* p. 56.)
[*C. tetraophthalmum*, *Bréb.*, forma, *Lund (Desm. Suec.*
p. 27).]

I. Ballynahinch; Creggan Lough; Roundstone; near Westport; Nacoogarrow Lough; Shindilla Lough.—II. Lough Guitane; Glengarriff.

50. COSMARIUM BREBISSEI, *Menegh.* (*Ralfs, Brit. Desm.* p. 100, tab. 16. fig. 3.)

I. Ballynahinch; Lough Annierin; near Oughterard; Derryclare Lough; Roundstone; Oorid Lough; near Recess; Nacoogarrow Lough.—II. Lough Guitane; Glengarriff; Upper and Lower Lakes of Killarney.

††Forma EROSA. (Pl. XXI. fig. 6.)

F. dorso subglabrato et subtruncato.

Long. 95 μ ; lat. 70 μ ; lat. isthm. 25 μ ; crass. 47.5 μ .

I. Derryclare Lough.—II. Lough Guitane; Glengarriff; Carrantuohill.

51. C. CONSPERSUM, *Ralfs.* (*Brit. Desm.* p. 101, tab. 16. fig. 4.)

I. Creggan Lough; Roundstone; Lakes, Clifden to Roundstone.—II. Adrigole.

††Var. SUBROTUNDATUM, nov. var. (Pl. XXI. fig. 7.)

Var. angulis superioribus semicellularum rotundatioribus quam in var. *rotundato*, *Wittr.* (*Anteck. Skand. Desm.* p. 13, fig. 4); granulis numerosioribus in series horizontales (circiter 12), in series verticales (circiter 21) ordinatis.

Long. 84 μ ; lat. 82 μ ; lat. isthm. 30 μ ; crass. 42 μ .

II. Cromagloun.

52. C. MARGARITIFERUM, *Menegh.* (*Ralfs, Brit. Desm.* p. 100, tab. 16. fig. 2.)

I. Near Westport; Boy Lough.—II. Clogherbeen; Glengarriff; Guitane and Cloonee Loughs.

53. C. PORTIANUM, *Arch.* (*Pritch. Infus.* ed. 1861, p. 733.)

Long. 33 μ ; lat. 29 μ ; lat. isthm. 8.5 μ .

I. Lakes, Clifden to Roundstone, and E. of Lough Bofin;

Aunierin; Shannacloontippen and Derryclare Loughs; near Westport.—II. Lough Guitane; Glengarriff; near Lough Brin; Carrantuohill; Kenmare; Adrigole.

†Var. NEPHROIDEUM, *Wittr.* (*Om Gotl. och Ol. Sötvatt.* p. 57.)

I. Lakes E. of Lough Bofin.

54. COSMARIUM RENIFORME, *Arch.* [C. margaritiferum, *Menegh.*, β . reniforme, *Ralfs, Brit. Desm.* p. 100, tab. 16. fig. 2 a.]
Long. 57 μ ; lat. 44 μ ; lat. isthm. 16 μ .

I. Creggan Lough; near Westport; Ballynahinch; Lough Aunierin; Lakes near Recess and E. of Lough Bofin; Derryclare Lough; Nacoogarrow Lough.—II. Lough Guitane; Kenmare; Cloonee Lough; Carrantuohill; 8 m. S. of Kenmare.

††55. C. SPHÆROIDEUM, nov. sp. (Pl. XXI. fig. 8.)

C. mediocre, diametro $1\frac{1}{2}$ plo longius, profunde constrictum, sinu angusto introrsum fere ampliato; semicellulæ late ovaes et subcomplanatæ ad basin; granulis magnis in quincuncem ordinatis (circiter 11 obliquis seriebus); a vertice conspectæ ellipticæ; a latere visæ subrotundæ; pyrenoidibus binis.

Long. 63 μ ; lat. 38 μ ; lat. isthm. 10–14 μ ; crass. 27 μ .

I. Arderry Lough.—II. Cromagloun; Glen Caragh; Castletown.

Compare with *C. logiense*, *Biss.*, and *C. margaritiferum*, *Menegh.*

56. C. LOGIENSE, *Biss.* (*Journ. Roy. Micr. Soc.* 1884, p. 194, tab. 5. fig. 4.)

I. Roundstone.—II. Cloonee Lough; Carrantuohill; Castletown.

57. C. PUNCTULATUM, *Bréb.* (*Nord. Desm. Spetsb.* p. 26, tab. 6. fig. 1.)

I. Near Westport; Roundstone; Lakes near Recess; Lakes Clifden to Roundstone; Derryclare Lough; Ballynahinch; Nacoogarrow Lough.—II. Lower Lake of Killarney; Carrantuohill.

†58. C. BIPUNCTATUM, *Boerg.* (*Desm. Brasil.* p. 945, tab. 4. fig. 33.)

I. Near Westport.

†59. *COSMARIUM SUBPUNCTULATUM*, Nord. (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 47, tab. 5. fig. 8.)

I. Near Westport.

††Var. *BOERGESENII*, nov. var. [*C. subpunctulatum*, Nord., forma, Boerg. (*Bidrag til Bornh. Desmidie-Flora*, p. 144, tab. 6. fig. 4).] (Pl. XXI. fig. 9.)

A forma typica differt granulis validioribus, iis (circiter 8) ad medium submajoribus, seriebus transversis duabus, apicibus distincte sed minute granulatis.

Long. 29 μ ; lat. 28 μ ; lat. isthm. 9 μ .

I. Lakes, Clifden to Roundstone; Ballynahinch.

†60. *C. ARNELLII*, Boldt. (*Siber. Chlor.* Taf. 5. fig. 15.)

††Forma *COMPRESSA*. (Pl. XXI. fig. 10.)

Forma parvior relative latior quam forma typica, seriebus transversis granulorum validioribus et propioribus basi semi-cellularum.

Long. 42 μ ; lat. 37 μ ; lat. isthm. 16 μ .

I. Lakes, Clifden to Roundstone.

61. *C. BLYTTII*, Wille. (*Bidrag til Kundsk. om Norg. Ferskv.* p. 25, tab. 1. fig. 7.)

I. Athry Lough; Glendalough; Letereen Lough; Lough Aunierin.—II. Lough Guitane; near Lough Brin; Cloonee Lough; Adrigole.

††62. *C. SYNTHLIBOMENUM*, nov. sp. (Pl. XXI. fig. 11.)

C. perpusillum, circiter tam longum quam latum, leviter constrictum, sinu lato et obtuso; semicellulæ ellipticæ et compressæ, granulis parvis exilibus decem circiter in ambitu; a vertice visæ ellipticæ; a latere visæ subcirculares; membrana leviter et sparsim subgranulata; pyrenoidibus binis.

Long. 12–12.5 μ ; lat. 11–12.5 μ ; lat. isthm. 8–9 μ ; crass. 6–8 μ .

I. Ballynahinch.

This is much smaller than *C. orthostichum*, Lund, var. *pumilum*, Lund (*Desm. Suec.* p. 25, tab. 2. fig. 10), which it somewhat resembles; but differs in the longitudinally compressed cells and in its much broader isthmus as well as in its *binate pyrenoids*, and much fainter granules, and other characters. It is distinct from *C. sphaerostichum*, Nord. (Nord. et Witttr.

Desm. et Œdog. in Tyrol, p. 29, tab. 12. fig. 3), and *Cosmarium brasiliense*, Nord. (Fr. Wat. Alg. of New Zeal. and Austr. p. 51), in its very different sinus, apex, and other characters.

63. COSMARIUM ORTHOSTICHUM, *Lund.* (*Desm. Succ.* p. 24, tab. 2. fig. 9.)

I. Ballynahinch.—II. Glengarriff.

64. C. BOTRYTIS, *Menegh.* (*Ralfs, Brit. Desm.* p. 99, tab. 16. fig. 1.)

I. Near Westport; Lough Shindilla; Nabincka and Creggan Loughs; Lakes E. of Lough Bofin.—II. Lower Lake of Killarney; Lough Guitane; Mallow; 8 m. S. of Kenmare; Glengarriff.

††Var. MEDIOLÆVE, nov. var. (Pl. XXI. fig. 12.)

Semicellulæ apice subtruncato subretuso glabrato, granulis concentricæ et radiatæ dispositis, medium versus parvioribus, ad medium glabræ; a vertice visæ ellipticæ, lateribus compressis; a latere visæ oblongo-ellipticæ, lateribus subrectis; pyrenoidibus binis.

Long. 65–70 μ ; lat. 55–59 μ ; lat. isthm. 15 μ ; crass. 25–27 μ .

I. Lakes, Clifden to Roundstone; near Westport; Nacoo-garrow Lough.—II. Clogherheen.

65. C. EBORACENSE, *West.* (*Freshwater Algæ N. Yorks., Journ. Bot.* Oct. 1889, tab. 291. fig. 1.)

II. Cloonee Lough; Kenmare.

66. C. TURPINII, *Bréb.*, var. LUNDELLII, *Gutw.* [*C. Turpinii, Bréb.*, forma, *Lund (Desm. Succ.* p. 29).]

Long. 50–63 μ ; lat. 45–62 μ ; lat. isthm. 19–21 μ ; crass. 28–33 μ .

I. Near Westport.—II. Lower Lake of Killarney.

†67. C. FORMULOSUM, *Hoff. in Nord. Desm. fr̄cn Bornholm*, p. 194, tab. 6. figs. 6–7.

I. Lough Aunierin.—II. Cloonee Lough.

68. C. PRÆMORSUM, *Bréb. in Pritch. Infus.* ed. 1861, p. 733.

I. Near Westport; Lakes, Clifden to Roundstone.

69. *COSMARIUM BROOMEI*, *Thw. in Ralfs, Brit. Desm.* p. 103, tab. 16. fig. 6, tab. 33. fig. 7.

I. Near Westport.

70. *C. CONFUSUM*, *Cooke*, var. *REGULARIUS*, *Nord.* (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 47, tab. 5. fig. 6.)

I. Lakes near Recess; Arderry Lough; Lakes, Clifden to Roundstone; Derryclare Lough; Lough Aunierin; Creggan Lough; Oorid Lough; Lakes east of Lough Bofin; Naccogarrow Lough; Boy Lough.—II. Muckcross; Upper Lake of Killarney; Glen Caragh; Glengarriff.

††**AMBIGUUM*, nov. subsp. (Pl. XXI. fig. 13.)

C. mediocre, diametro quarto parte longius, profunde constrictum, sinu lineari extremo ampliato; semicellulæ breviter subpyramidatæ, late truncatæ ad apicem, angulis inferioribus et superioribus rotundatis, granulis magnis subconcentrice ordinatis (nudæ ad apicem); a vertice visæ ellipticæ; a latere visæ circulares, granulis in circiter 6 seriebus transversis longitudinalibusque; pyrenoidibus binis.

Long. 50–52 μ ; lat. 42–43 μ ; lat. isthm. 12–13 μ ; crass. 28 μ .

I. Ballynahinch; Creggan Lough; Derryclare Lough; Lough Aunierin.—II. Cromagloun; Upper Lake of Killarney.

71. *C. AMÆNUM*, *Bréb. in Ralfs, Brit. Desm.* p. 102, tab. 17. fig. 3.

Long. 46–49 μ ; lat. 21–25 μ ; lat. isthm. 8–12 μ ; crass. 17–18 μ .

I. Roundstone; Ballynahinch; Arderry Lough; near Oughterard; near Westport; Lakes, Clifden to Roundstone; Lakes east of Lough Bofin; Derryclare Lough; Lough Aunierin; Athry Lough.—II. Cromagloun; near Lough Brin.

†Var. *MEDIOLÆVE*, *Nord.* (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 50, tab. 5. fig. 12.)

Long. 52 μ ; lat. 32 μ ; lat. isthm. 16 μ .

I. Ballynahinch.

†72. *C. PSEUDAMÆNUM*, *Wille.* (*Bidrag til Sydamerik. Alg. Fl.* p. 18, tab. 1. fig. 37.)

I. Clifden.

73. *COSMARIUM CYLINDRICUM*, *Ralfs*. (*Annals of Nat. Hist.* vol. xiv. p. 392, tab. 11. fig. 1; *Brit. Desm.* p. 106, tab. 17. fig. 4.)

I. Athry Lough.

74. *C. ANNULATUM*, *De Bary*. [*Dysphinctium annulatum*, *Neag.* (*Einz. Alg.* p. 110, tab. 6. fig. F).]

Long. 44·5 μ ; lat. max. 16 μ ; lat. ad apic. 14 μ .

I. Nacoogarrow Lough.—II. Carrantuohill; Adrigole.

†75. *C. SUBCOSTATUM*, *Nord.* (*Wittr. et Nord. Desm. et Ædog. in Tyrol*, p. 37, tab. 12. fig. 13.)

I. Derryclare Lough.—II. Lower Lake of Killarney.

†76. *C. SUBPROTUMIDUM*, *Nord.* (*Wittr. et Nord. Desm. et Ædog. in Tyrol*, p. 38, tab. 12. fig. 14.)

Forma. (Pl. XXIV. fig. 21.)

Long. 32 μ ; lat. 25 μ ; lat. apic. 14 μ ; lat. isthm. 8·5 μ .

I. Lakes, Clifden to Roundstone.

77. *C. BOECKII*, *Wille.* (*Bidrag til Kundsk. om Norges Ferskv.* p. 28, tab. 1. fig. 10.)

I. Ballynahinch; Lough Aunierin; Nacoogarrow, Nabincka, and Shindilla Loughs; Derryclare Lough.—II. Carrantuohill; Adrigole; Kenmare; Mallow.

††**BIPAPILLATUM*, nov. subsp. (Pl. XXI. fig. 14.)

C. mediocre, paulo longius quam latum, profunde constrictum, sinu angusto et lineari; semicellulæ semicircularo-trapezicæ, dorso truncatæ et tetraundulatæ, granulis circiter quinque ad marginem lateralem unumquemque, granulorum seriebus duobus intra marginem; series exterior granulis 13, series interior interrupta granulis 7, in medio cum papillis binis longitudinaliter dispositis; a vertice visæ ellipticæ, papillam medianam unam ostendens; a latere visæ subcirculares, utrobique papillis binis.

Long. 34 μ ; lat. 28 μ ; lat. isthm. 9 μ ; crass. 17 μ .

I. Creggan Lough.

78. *C. SPHALEBOSTICHUM*, *Nord. in Nord. et Wittr. Desm. Ital.* p. 28, tab. 12. fig. 3; *Cooke, Brit. Desm.* p. 111, tab. 42. fig. 6.

I. Kylemore; Lakes east of Lough Bofin; Derryclare and

Nacoogarrow Loughs.—II. Loughs Guitane and Cloonee; Lower Lake of Killarney; Carrantuohill; Glengarriff.

79. *COSMARITUM CÆLAUM*, *Ralfs*. (*Brit. Desm.* p. 103, tab. 17. fig. 1.)

Long. 40–45 μ ; lat. 36–37 μ ; lat. isthm. 12–13 μ .

I. Near Westport; Kylemore; Glendalough; Nacoogarrow Lough.—II. Carrantuohill; Upper and Lower Lakes of Killarney; Glengarriff; Castletown; 8 m. S. of Kenmare.

80. *C. ORNATUM*, *Ralfs*, in *Annals of Nat. Hist.* vol. xiv. p. 392, tab. 11. fig. 3; *Brit. Desm.* p. 104, tab. 16. fig. 7.

I. Ballynahinch; Athry Lough; Roundstone; Lough Aunierin; Lough Shannaclontippen; near Westport Lakes east of Lough Bofin; Derryclare Lough.—II. Muckcross; Upper Lake of Killarney; Lough Guitane; Adrigole.

81. *C. KJELLMANNI*, *Wille*. (*Ferskv. Alg. fr. Nov. Seml.* p. 42, tab. 12. fig. 31.)

II. Near Lough Brin.

†Var. *ORNATUM*, *Wille*. (*L. c.* p. 42, tab. 12. fig. 32.)

Forma granulis in series 4 verticales dispositis.

I. Athry Lough.

82. *C. COMMISSURALE*, *Bréb.*, †var. *CRASSUM*, *Nord.* (*Desm. Brasil.* tab. 3. fig. 19.)

II. Cromagloun; Glen Caragh.

Agreeing exactly with Nordstedt's figure, with the exception that the aperture of the sinus is closed.

83. *C. QUINARIUM*, *Lund.* (*Desm. Suec.* p. 28, tab. 2. fig. 14.)

I. Ballynahinch.—II. Kenmare; near Lough Brin.

84. *C. QUADRIFARIUM*, *Lund.* (*Desm. Suec.* p. 32, tab. 3. fig. 12.)

Long. 47·5–57·5 μ ; lat. 34–38 μ ; lat. isthm. 10–12·5 μ ; crass. 20 μ .

I. Kylemore.—II. Castletown; Carrantuohill; Adrigole.

Forma *HEXASTICHA*, *Nord.* (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 49). [*C. hexastichum*, *Lund* (*Desm. Suec.* p. 33, tab. 3. fig. 13).]

I. Ballynahinch.—II. Adrigole.

†85. *COSMARIUM RADIOSUM*, *Wolle*. (*Desm. U. S.* p. 90, tab. 19. figs. 21, 22.)

Long. $55\ \mu$; lat. $45\ \mu$; lat. isthm. $12\ \mu$.

I. Creggan Lough.

86. *C. SPECIOSUM*, *Lund*, var. *SIMPLEX*, *Nord*. (*Desm. Spetsb.* p. 31, tab. 6. fig. 12.)

II. Carrantuohill.

87. *C. SUBSPECIOSUM*, *Nord*. (*Desm. Arct.* p. 22, tab. 6. fig. 13.)

I. Creggan Lough.

88. *C. NOTABILE*, *Bréb.*, f. *MINOR*, *Wille*. (*Ferskv. Alg. fr. Nov. Seml.* p. 36, tab. 12. fig. 17.)

Long. $28\ \mu$; lat. $20\ \mu$; lat. isthm. $15\ \mu$; crass. $11\ \mu$.

I. Near Westport.

89. *C. ORBICULATUM*, *Ralfs*, in *Annals of Nat. Hist.* vol. xiv. p. 392, tab. 11. fig. 2; *Brit. Desm.* p. 107, tab. 17. fig. 5.

Long. $35\ \mu$; lat. $19\ \mu$; lat. isthm. $8\ \mu$.

I. Ballynahinch.—II. Carrantuohill.

90. *C. ISTHMIUM*, *West*. (*Fr. Wat. Alg. of North Wales*, p. 290, pl. 5. fig. 19.) [*C. excavatum*, *Nord*., f. *duplomajor*, *Lund* (*Desm. Suec.* p. 46); *Wolle* (*Desm. U. S.* p. 77, pl. 53. figs. 14, 15); *Wille* (*Ferskv. Alg. f. Nov. Seml.* p. 47).]

†† *Forma HIBERNICA*. (Pl. XXI. fig. 15.)

Forma major, angulis inferioribus rotundatioribus, isthmo latiore; pyrenoidibus singulis et magnis.

Long. $50\text{--}53\ \mu$; lat. $31\ \mu$; lat. isthm. $19\text{--}21\ \mu$.

I. Ballynahinch.—II. Sugar Loaf Mt.; Castletown; Glengarriff.

The dimensions of the Welsh specimens here considered as type were:—Long. $40\ \mu$; lat. $25\text{--}26\ \mu$; lat. isthm. $11\ \mu$.

Although this species has been placed under *C. excavatum*, *Nord*. (*Desm. Brasil.* tab. 3. fig. 25), by several writers, it is distinct. *C. excavatum* is much smaller, and it is much longer relatively, moreover the form of its median excavation is so different. Mr. Bennett (*Journ. Royal Micr. Soc.*, June 1890, p. 305), reasoning from the figure and description, considers it as a dividing form of *C. orbiculatum*, *Ralfs*; however, many

examples were seen, and none of them showed any signs of the familiar characteristic appearance appertaining to stages of division.

I also think that *Cosmarium excavatum*, Nord., var. *ellipticum*, Wille (Ferskv. Alg. fr. Nov. Seml. p. 47, tab. 13. fig. 46), is a variety of *C. isthmium*, as his measurements (long. $29\ \mu$; lat. $23\ \mu$; crass. $20\ \mu$; lat. isthm. $11\ \mu$) come nearer to a shortened form of it, moreover its granules and excavation are much nearer to those of the latter; I propose to call it var. *Willei*, nob. Prof. Lagerheim (Bidrag til Amerikas Desmidié-Flora) enumerates *C. excavatum*, Nord., and gives the following measurements:—Long. $44\ \mu$; lat. $24\ \mu$; lat. isthm. $12\ \mu$; judging from these dimensions, the plant he describes seems to belong to *C. isthmium* rather than to *C. excavatum*. The var. *trigonum*, Lagerh. (*l. c.*), of the latter species is so widely different in comparative length and breadth (long. $20\ \mu$; lat. $18\ \mu$; crass. $18\ \mu$; lat. isthm. $13\ \mu$) as well as in its trigonal vertical aspect, that it is probably a distinct species, and may possibly belong to the genus *Staurastrum*.

91. COSMARIUM MONILIFORME, *Ralfs*. (*Brit. Desm.* p. 107, tab. 17. fig. 6.)

Long. $21-28\ \mu$; lat. $11-13\ \mu$; lat. isthm. $4-8\ \mu$.

I. Near Oughterard; Creggan Lough; Lakes, Clifden to Roundstone; Lakes east of Lough Bofin; Ballynahinch; Derryclare Lough.—II. Cromagloun; Glen Caragh; Lower Lake of Killarney; Adrigole; Cloonee Lough.

Forma semicellulis subrotundatis (levissime subangularibus).

Long. $38-42\ \mu$; lat. $18-20\ \mu$; lat. isthm. $4-5\ \mu$.

I. Ballynahinch.

92. C. CONTRACTUM, *Kirch.* (*Wolle, Desm. U. S.* p. 63, tab. 16. fig. 1, tab. 50. fig. 24.)

I. Ballynahinch; Clifden; Lough Aunierin.—II. Cromagloun; Torc Mt.; Adrigole.

93. C. GLOBOSUM, *Buln., in Hedwigia*, vol. ii. p. 52, tab. 9. fig. 8.

Long. $30\ \mu$; lat. $25\ \mu$; lat. isthm. $17.5\ \mu$.

I. Lakes east of Lough Bofin.

94. *COSMARIUM CONNATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 108, tab. 17. fig. 10.

I. Ballynahinch; Lough Aunierin; Lakes near Recess; Lakes, Clifden to Roundstone; Derryclare Lough; Lakes E. of Lough Bofin.

††Var. *TRUNCATUM*, nov. var. (Pl. XXI. fig. 16.)

Var. *apicibus truncatis et incisura mediana profundiore constricta.*

Long. 105 μ ; lat. 75 μ ; lat. isthm. 45 μ .

I. Derryclare Lough.

95. *C. PSEUDOCONNATUM*, *Nordl. (Desm. Brasil.* p. 214, tab. 3. fig. 17.)

Long. 47·5–51 μ ; lat. 33–38 μ ; lat. isthm. 31–32·5 μ .

I. Ballynahinch; Athry Lough; Lakes east of Lough Bofin.
—II. Muckcross; Upper Lake of Killarney; Adrigole.

††Var. *CONSTRICITUM*, nov. var. (Pl. XXI. fig. 17.)

Var. *insignis et major, a forma typica differt multum profundiore constrictione.*

Long. 65 μ ; lat. 43 μ ; lat. isthm. 26 μ .

I. Ballynahinch.

†96. *C. VIRIDE*, *Joshua, in Journ. Bot.* Feb. 1885, tab. 254. fig. 3.—*Colpopelta viridis*, *Corda, Almanac de Carlsbad*, 1835, p. 206, tab. 2. fig. 28.—*Cosmarium Cordanum*, *Bréb. in Pritch. Inf.* ed. 1861; *W. Turner, in Journ. Roy. Micr. Soc.* Dec. 1885, p. 934, tab. 15. fig. 4; *West, in Journ. Roy. Micr. Soc.* Feb. 1889, p. 18, tab. 3. fig. 23.

††Forma *MINOR.*

Long. 31–32·5 μ ; lat. 18–19 μ ; lat. isthm. 12·5–15 μ .

I. Derryclare Lough; Ballynahinch.

The following is a comparative list of the published dimensions of this species:—

	Long.	Lat.	Lat. isthm.
Joshua (examples from Nova Scotia)	55 μ	30-33 μ	22 μ
Turner (examples from Nova Scotia)	47-50 μ	26-27 μ	17-19 μ
West (examples from Massachusetts)	41-45 μ	20-25 μ	14-20 μ

†97. *COSMARIUM ARCTOUM*, Nord. (*Desm. Arct.* p. 28, tab. 7. fig. 22.)

††Forma MINOR. (Pl. XXIV. fig. 24.)

Long. 12.5 μ ; lat. 10 μ ; lat. isthm. 8.5 μ ; crass. 7.5 μ .

I. Ballynahinch.

98. *C. PSEUDARCTOUM*, Nord. in Nord. & Wittr., *Alg. Exsicc.* no. 257.

I. Ballynahinch.—II. Carrantuohill; near Lough Brin.

99. *C. CUCURBITA*, Bréb. (*Ralfs, Brit. Desm.* p. 108, tab. 17. fig. 7.)

I. Creggan Lough; Kylemore; Ballynahinch; Roundstone; Oorid Lough; near Oughterard.—II. Cromagloun; Torc Mt.; Lower Lake of Killarney; Carrantuohill; Adrigole; near Lough Brin.

††Forma MAJOR. (Pl. XXIV. fig. 25.)

Long. 60 μ ; lat. 30 μ ; lat. isthm. 25 μ .

I. Ballynahinch.

100. *C. PALANGULA*, Bréb. (*Rabh. Fl. Europ. Alg.* iii. p. 174; *Cooke, Brit. Desm.* p. 125, tab. 44. fig. 9.)

II. Lower Lake of Killarney; Glen Caragh.

Var. DE-BARYI, *Rabh. (Fl. Europ. Alg.* iii. p. 175.)

Long. 46 μ ; lat. 22 μ .

I. Clifden; Ballynahinch.

††101. *C. OBCUNEATUM*, nov. sp. (Pl. XXI. fig. 18.)

C. parvum, circiter 3plo longius quam latius, medio leviter constrictum; semicellulæ oblongo-pyramidatae, truncatae et subretusae ad apicem; a vertice conspectae circulares; membrana irregulariter punctata.

Zygosporæ globosæ, aculeis simplicibus longis munitæ.

Long. $42\ \mu$; lat. lad. bas. semicell. $15\ \mu$; at. ad apic. $10\ \mu$;
diam. zygospor. $29\ \mu$; long. acul. $10-12\ \mu$.

II. Cromagloun.

This appears to me to be sufficiently distinct from *C. palan-
gula*, Bréb. I have met with *C. Cucurbita*, Bréb., in conjugation
from West Yorks. (*vide* "Additions to Freshw. Alg. of W.
Yorks.," in 'Naturalist,' Aug. 1891, p. 246), and from the North-
east of Ireland; the fully developed zygosporæ were globose and
without spines.

This was only seen in zygosporæ, and the surrounding in-
separable débris prevented the cytioderm of the semicells from
being properly observed. The zygosporæ points to this being a
Cosmarium, but the arrangement of the chlorophyll was not
seen.

Compare with *Penium adelochondrum*, Elfv.

102. COSMARIUM THWAITESII, *Ralfs*. (*Brit. Desm.* p. 109,
tab. 17. fig. 8.)

I. Lough Aunierin.—II. Sugar Loaf Mt.; Carrantuohill.

103. *C. RALFSII*, Bréb. in *Ralfs*, *Brit. Desm.* p. 93, tab. 15.
fig. 3.

I. Near Oughterard; near Recess; Kylemore.—II. Cromag-
loun; Tore Mt.; Carrantuohill; Castletown.

†Forma MONTANUM, *Racib.* (*De nonn. Desm. Polon.* p. 15,
tab. 1. fig. 4.)

II. Carrantuohill.

104. *C. CUCUMIS*, *Corda.* (*Alm. de Carlsbad*, 1835, p. 121,
fig. 27; *Ralfs*, *Brit. Desm.* p. 93, tab. 15. fig. 2.)

Zygosporæ globosæ, glabræ.

Long. $54-57\ \mu$; lat. $30-31\ \mu$; lat. isthm. $10-12\ \mu$; diam.
zygospor. $25\ \mu$.

I. Lakes near Recess; Lakes, Clifden to Roundstone; Lough
Aunierin (cum zygosporæ).—II. Tore Mt.; Carrantuohill; Glen
Caragh; Castletown.

††105. *C. (PLEUROTÆNIOPSIS) HIBERNICUM*, nov. sp. (Pl. XXI.
fig. 19.)

C. (Pleurotæniopsis) magnum, diametro circiter duplo longius,

incisura mediana latissima et brevi; semicellulæ subrotundatæ, apicibus late rotundatis; a vertice visæ circulares; membrana lævis. Massa chlorophyllacea in laminis parietalibus dispositis irregulariter.

Long. $90\ \mu$; lat. $45\ \mu$.

I. Lakes, Clifden to Roundstone; Ballynahinch.

106. COSMARIUM DE-BARYI, *Arch.* [Pleurotænium cosmarioides, *De Bary* (*Rabh. Fl. Europ. Alg.* iii. p. 144).—Calocylindrus De-Baryi, *Cooke, Brit. Desm.* p. 128, tab. 44. fig. 4.]

I. Near Westport; Ballynahinch; Derryclare Lough.—

II. Lough Guitane; near Lough Brin.

107. C. OVALE, *Ralfs, Brit. Desm.* p. 98, tab. 15. fig. 9.

Long. $182\text{--}188\ \mu$; lat. $100\text{--}107\ \mu$; lat. isthm. $30\text{--}35\ \mu$; crass. $75\ \mu$.

I. Ballynahinch.—II. Adrigole.

108. C. ELEGANTISSIMUM, *Lund.* (*Desm. Suec.* p. 53, tab. 3. fig. 20.)

†† Forma MINOR. (Pl. XXIV. fig. 10.)

Long. $50\ \mu$; lat. $23\ \mu$; lat. isthm. $19\ \mu$.

II. Carrantuohill.

1. XANTHIDIUM ARMATUM, *Bréb. in Ralfs, Brit. Desm.* p. 112, tab. 18.

I. Ballynahinch; Kylemore; Oorid Lough; Arderry Lough; Lough Aunierin; near Oughterard; Lakes near Recess; Lakes, Clifden to Roundstone.—II. Glen Caragh; Adrigole; Glengarriff; Castletown; Carrantuohill.

†† Var. IRREGULARIUS, nov. var. (Pl. XXII. fig. 1.)

Semicellulæ suboctangulares sinu aperto (nec lineari); processibus subirregularibus irregulariter dispositis, aliis ad spinas simplices curvatas reductis.

Long. sine proc. $160\text{--}165\ \mu$; lat. sine proc. $95\text{--}107$; lat. cum proc. $110\text{--}123\ \mu$; lat. apic. $55\text{--}59\ \mu$; lat. isthm. $41\text{--}50\ \mu$.

I. Ballynahinch; Kylemore.

2. X. ACULEATUM, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 113, tab. 19. fig. 1.)

II. Lough Guitane.

3. *XANTHIDIUM FASCICULATUM*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 114, tab. 20. fig. 1.)

I. Derryclare Lough; Ballynahinch; Lakes near Recess.

4. *X. ANTILOPÆUM*, *Kuetz.* (*Cooke, Brit. Desm.* p. 132, tab. 46. fig. 2.)

I. Creggan Lough; Ballynahinch (cum zygosp.); Lough Aunierin; Derryclare Lough; Bahch Loughs.—II. Muckcross; Upper and Lower Lakes of Killarney; near Lough Brin; Adrigole; Glen Caragh; Castletown; Glengarriff.

An inchoate form of this was very frequently seen from Derryclare Lough, a figure of which is given (Pl. XXII. fig. 2). It differs from the type in having fewer spines, one semicell having but two spines, one on each inferior angle, the other semicell having four spines, two at each of the inferior angles, and one imperfect one at one of the superior angles; all the spines being less robust than normal, and arranged in the median plane of the lateral view. Compare with *X. inchoatum*, Nord. (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 45, tab. 4. fig. 30).

Long. 47 μ ; lat. sine spin.=long.; long. spin. 10 μ ; lat. isthm. 12.5 μ ; crass. 30 μ .

5. *X. CRISTATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 115, tab. 19. fig. 3.

I. Near Westport; Lough Aunierin; Ballynahinch; Creggan Lough; Lakes, Clifden to Roundstone; Derryclare Lough.—II. Muckcross; Glengarriff.

††Forma *ANGULATUM*. (Pl. XXII. fig. 3.)

Forma distincta angularis, spinis rectis ad angulos et membrana punctata.

Long. sine spin. 51 μ ; lat. cum. spin. 62 μ ; lat. sine spin. 40–43 μ ; lat. apic. 22 μ ; lat. isthm. 12.5 μ ; crass. 22.5 μ .

I. Lough Aunierin.

Var. *UNCINATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 115.

I. Ballynahinch.

Var. *SPINULIFERUM*, *West.* (*Fr. Wat. Alg. of N. Wales*, p. 291, tab. 5. fig. 21.)

I. Lough Aunierin.

††6. *XANTHIDIUM SUBHASTIFERUM*, nov. sp. (Pl. XXII. fig. 4.)

X. tam longum quam latum, incisura mediana profunda acutangula aperta; semicellulæ oblongo-ellipticæ, cum duo spinis singulis divergentibus ad utrumque latus; a vertice visæ ellipticæ cum spina una exhibente ad apices; a latere visæ rotundatæ; membrana lævis in centro semicellularum incrassato.

Long. $54\ \mu$; lat. sine spin. $50\ \mu$; long. spin. $12\cdot5$ – $18\ \mu$; lat. isthm. $19\ \mu$; crass. $27\ \mu$.

II. Lough Guitane; Glen Caragh.

This is at once distinguished from all other species hitherto described as British in bearing but two spines on each lateral margin of each semicell, the central protuberance is also reduced to a strong thickening of the membrane. From *X. hastiferum*, Turn. (Some New and Rare Desm., in Journ. Royal Micr. Soc., Dec. 1885, p. 938, pl. 15. fig. 20), it differs in its non-angular semicells, larger size, and in being destitute of the small apical spines; it differs from var. *inevolutum*, Nord. (Fr. Wat. Alg. of New Zeal. & Austr. p. 43, pl. 4. fig. 24), in its want of angularity, its larger size, and more elliptical end view.

7. *X. SMITHII*, Arch. (*Pritch. Infus.* ed. 1861, p. 736.)

I. Lakes, Clifden to Roundstone.—II. Cromagloun; Tore Mt.; Castletown.

††Var. *COLLUM*, nov. var. (Pl. XXII. fig. 5.)

Var. spinis tribus ad angulos superiores; marginibus laterali-bus et polis concavis, incisura lata et quadrata cum angulis incisuræ latæ et quadratæ rotundatis; isthmo longo.

Long. sine spin. $30\ \mu$; lat. ad bas. semicell. sine spin. $25\ \mu$; lat. ad apic. sine spin. $20\ \mu$; long. spin. 5 – $7\cdot5\ \mu$; lat. isthm. $9\ \mu$; crass. $15\ \mu$.

II. Cromagloun.

This is not a stage of division.

†Var. *VARIABLE*, Nord. (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 44, tab. 4. figs. 27–29.)

Long. sine spin. $22\cdot5$ – $25\ \mu$; long. cum spin. $23\cdot5$ – $27\ \mu$; lat. sine spin. 18 – $20\ \mu$; lat. cum spin. 22 – $23\cdot5\ \mu$; lat. isthm. $7\cdot5$ – $8\cdot5\ \mu$; crass. $12\cdot5$ – $14\ \mu$.

I. Near Oughterard; Clifden.—II. Cromagloun; Carrantuo-hill; Tore Mt.

††8. *XANTHIDIUM APICULIFERUM*, nov. sp. (Pl. XXIV. fig. 17.)

X. pusillum, tam longum quam latum, medio modice contractum, sinu angusto extrorsum dilatato; semicellulæ trapezoido-pyramidatæ, apicibus late truncatis spinas binas breves medium gerentibus, angulis inferioribus subrotundatis spinam unam brevem gerentibus, angulis superioribus spinas binas breves gerentibus; a vertice visæ ellipticæ brevi spina ad unumquemque polum, medio utroque latere tumore pusillo; a latere visæ subcirculares.

Long. cum spin. $12.5\ \mu$; long. sine spin. $11.5\ \mu$; lat. cum spin. $12.5\ \mu$; lat. sine spin. $12\ \mu$; lat. isthm. $5\ \mu$; crass. $6.5\ \mu$.

I. Lakes near Recess.

9. *X. CONCINNUM*, *Arch.*, ††var. *BOLDTIANA*, nov. var. [*Arthrodesmus hexagonus*, *Boldt*, forma, *Boldt* (*Siber. Chloroph.* taf. 5. fig. 17).] (Pl. XXII. fig. 6.)

Boldt's figure of *A. hexagonus* (*l. c.* fig. 16) seems to agree exactly with the description of *X. concinnum*, *Arch.* (*Journ. Dubl. Micr. Club*, iv. 1880–85, p. 32). *Boldt* also has a form of his above-mentioned species (fig. 17); this form appears to be the same as the Irish plant, so I propose to name it after *Boldt* as a variety of *Archer's* species. This belongs to the genus *Xanthidium*, because the semicells have a distinct central protuberance.

I. Near Oughterard; Moher Lough.—II. Lower Lake of Killarney, near O'Sullivan's Cascade.

Specimens from Moher Lough:—

Long. $14\ \mu$; lat. sine mucr. $12.5\ \mu$; lat. cum mucr. $16\ \mu$; lat. isthm. $4\ \mu$; crass. $8\ \mu$.

Specimens from near Oughterard:—

Long. $10\ \mu$; lat. sine mucr. 10 – $11.5\ \mu$; lat. cum mucr. 12.5 – $14\ \mu$; lat. isthm. 4 – $5\ \mu$; crass. $6.5\ \mu$.

1. *ARTHRODESMUS OCTOCORNIS*, *Ehrenb.* (*Xanthidium?* octocorne, *Ralfs, Brit. Desm.* p. 116, tab. 20. fig. 2.)

Long. 18 – $21\ \mu$; lat. sine spin. 15 – $16\ \mu$; lat. cum spin. 28 – $30\ \mu$; lat. isthm. 5 – $6\ \mu$.

I. Ballynahinch; Roundstone; Lakes near Recess; Baheh Loughs; Lough Shannaclontippen; near Oughterard; Lough Aunierin; Creggan and Derryclare Loughs; Glendalough; Letereen Lough.—II. Cromagloun; Lough Guitane; Muckcross;

Upper Lake of Killarney; near Lough Brin; Adrigole; Carrantuohill.

2. *ARTHRODESMUS INCUS*, Hass. (*Ralfs, Brit. Desm.* p. 118, tab. 20. fig. 4 *a-d*, non *e-h*). (Pl. XXIV. fig. 11.)

Diam. zygosp. (sine spin.) $17\ \mu$; diam. zygosp. (cum spin.) $27\ \mu$.

I. Moher Lough; near Leenane; Derryclare; Shannacloon-tippen and Letereen Loughs; Lakes, Clifden to Roundstone and near Recess; Kylemore; Ballynahinch; Roundstone; near Westport; near Oughterard; Lakes E. of Lough Bofin.—II. Lough Guitane; Carrantuohill; Adrigole; near Lough Brin; Lower Lake of Killarney (cum zygosp.); Cromaglouin; Muckcross; Sugar Loaf Mt.

Forma apicibus constanter convexis.

Long. sine spin. $23-25\ \mu$; lat. sine spin. $25-26\ \mu$; lat. cum spin. $45-50\ \mu$; long. spin. $13-17\ \mu$; lat. isthm. $10-15\ \mu$.

I. Ballynahinch.—II. Glengarriff.

†Var. *INTERMEDIUS*, *Wittr.* (*Anteck. Skand. Desm.* p. 15, fig. 6.)

I. Athry Lough.

††3. *A. RALFSII*, nov. sp.

[*A. Incus*, Hass., *Ralfs, Brit. Desm.* tab. 20. fig. 4 *e-h*, nec *a-d*.]

A. mediocre; cellulæ diametro $1\frac{1}{2}$ plo longius (sine aculeis), modice constrictum, sinu lato et aperto; semicellulæ latissime campanulatæ, angulis inferioribus gibbosis, angulis superioribus spinis longis validis subinflexis adornatis, apicibus subconcavis; a verticæ visæ anguste ellipticæ, spina longa valida ad polum utrumque; membrana glabra.

I. Roundstone; Derryclare Lough.—II. Castletown; Adrigole; near Lough Brin.

This differs from *A. Incus*, Hass., in its somewhat larger size, its subquadrate semicells, its subconcave ends, its generally more open sinus, and its incurved spines.

†4. *A. TRIANGULARIS*, *Lagerh.* (*Bidrag till Amerik. Desm. Fl.* p. 244, tab. 27. fig. 22.) Forma. (Pl. XXIV. fig. 19.)

I. Ballynahinch.

†Var. *AMERICANUS*, *nov.* [*A. Incus*, *Hass.*, var. *americanus*, *W. Turn.* (*Some new and rare Desm.*, in *Journ. Roy. Micr. Soc.*, Dec. 1885, p. 937, pl. 16. fig. 17).]

Var. *marginibus lateralibus convexioribus*, a vertice visæ cellulis latoribus.

Long. $27\ \mu$; lat. sine spin. $22.5\ \mu$; lat. cum spin. $65\ \mu$; long. spin. $22\ \mu$; lat. isthm. $9\ \mu$; crass. $11\ \mu$.

I. Lakes, Clifden to Roundstone, and near Recess.

5. *ARTHRODESMUS LONGICORNIS*, *Roy* (*in lit. cum icone*).

Long. $23\ \mu$; lat. cum spin. $62\ \mu$; lat. isthm. $7.5\ \mu$.

I. Derryclare Lough.

6. *A. CONVERGENS*, *Ehrenb.* (*Ralfs, Brit. Desm.* p. 118, tab. 20. fig. 3.)

I. Ballynahinch; Creggan Lough; Derryclare Lough; Clifden.—II. Clogherheen; Glen Caragh.

††7. *A. ELEGANS*, *nov. sp.* (Pl. XXII. fig. 7.)

A. mediocre, paulo longior quam latius (sine aculeis), profunde constrictus, sinu subrectangulari extremo obtuso; semicellulæ obverse semiorbiculares, marginibus lateralibus superioribus in spinis longis et subconvergentibus attenuatis, spinis binis brevibus delicatis truncato-bifurcatis intra margines laterales ornatae, dorso convexo spinis 6–8 brevibus delicatis truncato-bifurcatis ornatae; a vertice visæ ellipticæ, spinas breves longasque ostendentes; membrana glabra.

Long. sine proc. $30\ \mu$; long. cum proc. $38\ \mu$; lat. sine spin. $27\ \mu$; lat. cum spin. $65\ \mu$; long. spin. $20\text{--}22\ \mu$; lat. isthm. $10\ \mu$; crass. sine proc. $13\ \mu$; crass. cum proc. $25\ \mu$.

I. Ballynahinch.

8. *A. BIFIDUS*, *Bréb.*, var. *TRUNCATUS*, *West.* (*Journ. Bot.* Oct. 1889, tab. 291. fig. 9.)

I. Ballynahinch; Lakes, Clifden to Roundstone; Derryclare Lough.

††Var. *LATODIVERGENS*, *nov. var.* (Pl. XXII. fig. 8.)

A. minimus; tam longus quam latus, sinu late exciso; semicellulæ obverse triangulares, marginibus lateralibus subrectis apice recto, spinis duabus late divergentibus ad angulum unum unumquemque; a vertice visæ ellipticæ, spina una ad polum unumquemque; membrana glabra.

Long. cum spin. $18\ \mu$; long. sine spin. $12\cdot5\ \mu$; lat. cum spin. $18\ \mu$; lat. sine spin. $12\cdot5\ \mu$; crass. $6\cdot5\ \mu$.

I. Ballynahinch.

9. *ARTHRODESMUS TENUISSIMUS*, *Arch.* (*Rabh. Fl. Europ. Alg.* iii. p. 226.) (Pl. XXII. fig. 9.)

I. Ballynahinch; Lough Aunierin.

Specimens from Ballynahinch:—

Long. sine mucr. $8\ \mu$; long. cum mucr. $9\ \mu$; lat. cum spin. $19\ \mu$; lat. sine spin. $9\ \mu$; long. spin. $5\ \mu$; lat. isthm. $5\ \mu$.

Specimens from Lough Aunierin:—

Long. sine mucr. $12\cdot5\ \mu$; long. cum mucr. $14\ \mu$; lat. cum spin. $32\ \mu$; lat. sine spin. $12\cdot5\ \mu$; long. spin. $9\cdot5$ – $10\ \mu$; lat. isthm. $3\cdot5\ \mu$; crass. $6\ \mu$.

As we are unable to understand the figures representing vertical views of this species given in Cooke's *Brit. Desmids*, pl. 47. figs. 3 *d* & 3 *f*, we give a figure. Cooke's figures represent it as being $10\cdot5$ – $12\cdot5\ \mu$ long; the dimensions given in the text are $8\cdot5\ \mu$ long.

†10. *A.?* *GLAUCESCENS*, *Wittr.* (*Gotl. och Ol. Sötvat. Alg.* p. 55, tab. 4. fig. 11.)

I. Ballynahinch; Derryclare Lough; Creggan Lough.

††*Forma CONVEXA*. (Pl. XXII. fig. 10.)

F. paulo longior quam latum, minor apicibus convexis (nec retusis).

Long. $12\ \mu$; lat. sine spin. $10\ \mu$; lat. cum spin. $12\cdot5\ \mu$; lat. isthm. $5\ \mu$; crass. $6\cdot5\ \mu$.

I. Creggan Lough.—II. Adrigole.

1. *STAURASTRUM DEJECTUM*, *Bréb.* (*Ralfs, Desm.* p. 121, tab. 20. fig. 5.)

I. Clifden; Creggan Lough; Lakes near Recess; near Westport; Lough Shannacloontippen; Oorid Lough; Derryclare Lough; Glendalough.—II. Lough Guitane; Glen Caragh; Castletown; Glengariff; Lower Lake of Killarney; near Lough Brin; Adrigole.

††*Var. INFLATUM*, nov. var. (Pl. XXII. fig. 11.)

Var. multo major, semicellulis ellipticioribus et inflatis, spinis brevioribus (extrorsum versis).

Long. sine spin. $43\ \mu$; lat. sine spin. $52\ \mu$; lat. isthm. $12\ \mu$.

I. Derryclare Lough; Ballynahinch.

2. STAUSTRUM CONNATUM, *Roy et Biss.* (*Jap. Desm.* p. 237.)

Long. cum spin. 32–37 μ ; long. sine spin. 21–22.5 μ ; lat. cum spin. 25–28 μ ; lat. isthm. 9–10 μ .

I. Athry Lake; near Oughterard; Ballynahinch; Lakes, Clifden to Roundstone.—II. Adrigole.

3. S. APICULATUM, *Bréb.* (*Arch. in Pritch. Infus.* ed. 1861, p. 737.)

I. Ballynahinch; Kylemore; Roundstone; Lakes near Recess.—II. Carrantuohill; Lower Lake of Killarney; Clogheen.

4. S. DICKIEI, *Ralfs.* (*Brit. Desm.* p. 123, tab. 21. fig. 3.)

Long. 35 μ ; lat. sine spin. 29 μ ; lat. cum spin. 42 μ ; lat. isthm. 6 μ .

I. Baheh Loughs; near Westport.—II. Lough Guitane; Cloonee Lough; Adrigole; near Lough Brin; Muckcross; Glen Caragh.—Burren Hills, Co. Clare.

††Forma PUNCTATA.

Forma membrana minute punctata (nec granulata). (Vide var. *granulatum*, *Roy et Biss.* [*Jap. Desm.* p. 238].)

Long. 32 μ ; lat. 33 μ ; lat. isthm. 7 μ .

I. Clifden; near Westport; Ballynahinch.—II. Adrigole.

5. S. CUSPIDATUM, *Bréb.* (*Ralfs, Brit. Desm.* p. 122, tab. 21. fig. 1.)

I. Near Westport; Athry Lake; Derryclare Lough; Nacoo-garrow and Aunierin Loughs.—II. Lough Guitane.

†Var. DIVERGENS, *Nord.* (*Desm. Brasil.* tab. 4. fig. 49.)

Long. sine spin. 25 μ ; lat. sine spin. 20–22 μ ; long. spin. 10–12 μ ; lat. isthm. 6 μ .

I. Ballynahinch; Glendalough.—II. Adrigole.

†6. S. CORNICULATUM, *Lund.* (*Desm. Suec.* p. 57, tab. 3. fig. 23.)

††Var. SPINIGERUM, nov. var. (Pl. XXII. fig. 12.)

Var. minor, spinis distinctis ad apices angulorum, et isthmo angustiore.

Long. (sine spin.) 28 μ ; lat. 25 μ ; lat. isthm. 11.5 μ .

I. Lakes, Clifden to Roundstone.

Compare with var. *variabile*, *Nord.* (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 39, pl. 4. fig. 17).

†7. *STAUROSTRUM MINUTISSIMUM*, *Reinsch*, ††var. *CONSTRUCTUM*, nov. var. (Pl. XXIV. fig. 14.)

Var. major et profundius constricta quam forma typica; semicellulæ a vertice visæ trigonæ, lateribus subconcavis.

Long. 16 μ ; lat. 17.5 μ ; lat. isthm. 9 μ .

I. Clifden.

8. *S. ARISTIFERUM*, *Ralfs*. (*Brit. Desm.* p. 123, tab. 21. fig. 2.)

I. Derryclare Lough; Kylemore.

9. *S. PTEROSPORUM*, *Lund*. (*Desm. Suec.* p. 60, tab. 3. fig. 29.)

II. Adrigole.

10. *S. O'MEARII*, *Arch.* (*Pritch. Infus.* ed. 1861, p. 738.)

I. Athry Lough; Roundstone.—II. Castletown; Adrigole.

††Var. *MINUTUM*, nov. var. (Pl. XXII. fig. 15.)

S. minutum, brevius quam latius, minus quam forma typica, spinis longioribus, apicibus subconcavis; semicellulæ a vertice visæ angulis acutissimis.

Long. sine spin. 7–8 μ ; lat. sine spin. 10 μ ; long. spin. 10 μ ; lat. isthm. 5 μ .

II. Cromagloun.

††11. *S. CURVATUM*, nov. sp. (Pl. XXII. fig. 13.)

S. mediocre, latius quam longius, profunde constrictum, sinu subrectangulâ extremo obtuso; semicellulæ (extrorsum) lunatæ, dorso concavæ, utroque fine in aculeum longum gracilem divergentem attenuato; a vertice visæ triangulares, lateribus concavis, angulis in aculeum longum gracilem productis; membrana glabra.

Long. sine spin. 25 μ ; lat. sine spin. 20 μ ; long. spin. 20 μ ; lat. isthm. 5–6 μ .

I. Derryclare Lough; Ballynahinch.—II. Lough Guitane.

This differs from *S. dejectum*, Bréb., and allied species in the form of the cells in both front and vertical views.

††12. *S. JACULIFERUM*, nov. sp. (Pl. XXII. fig. 14.)

S. parvum, circiter 1½plo longius quam latius, profunde constrictum, sinu acutangulo et amplissimo; semicellulæ cuneatæ cum lateribus convexis et subconvexæ ad apices, angulis superioribus cum spinis validis longissimis divergentibus; a vertice visæ trigonæ, lateribus subconvexis et spina una ad utrumque angulum. Membrana lævis.

Long. sine acul. 27–30 μ ; lat. sine acul. 17–20 μ ; long. acul. 30–38 μ ; lat. isthm. 7–7.5 μ .

II. Lough Guitane.

This is widely different from *Staurostrum aristiferum*, Ralfs, to which British species it nearest approaches, the convex sides of the end view and the different insertion of the spines being alone sufficient to distinguish it. From *S. Lewisii*, Wood, it differs in the absence of the small spines from the straight sides of the front view of the more triangular semicells.

13. STAURASTRUM MEGACANTHUM, *Lund.* (*Desm. Suec.* p. 61, tab. 4. fig. 1.)

I. Lakes, Clifden to Roundstone; Ballynahinch.

†14. S. BACILLARE, *Bréb. in Ralfs, Brit. Desm.* p. 214, tab. 35. fig. 21.

Long. 25 μ ; lat. 33 μ ; lat. isthm. 7 μ .

I. Lough Aunierin.

Var. OBESUM, *Lund.* (*Desm. Suec.* p. 57, tab. 3. fig. 24.)

II. Adrigole.

15. S. LUNATUM, *Ralfs.* (*Brit. Desm.* p. 124, tab. 34. fig. 12.)

Long. sine spin. 25 μ ; lat. sine spin. 30 μ ; lat. cum spin. 36 μ ; lat. isthm. 12.5 μ .

I. Derryclare Lough; Oorid Lough.—II. Near Lough Brin.

16. S. CRISTATUM, *Arch.* (*Pritch. Infus.* ed. 1861, p. 738.) (Pl. XXII. fig. 16.)

Long. 40 μ ; lat. (cum spin.) 45–46 μ ; lat. isthm. 22.5 μ .

I. Lakes, Clifden to Roundstone.—II. Glengarriff; Carrantuo-hill.

17. S. OLIGACANTHUM, *Bréb.*, ††var. INCISUM, nov. var. (Pl. XXII. fig. 17.)

Semicellulæ marginibus lateralibus inferioribus incisus; a verticæ visæ triangulatæ, lateribus leviter convexis.

Long. 39 μ ; lat. 40 μ ; lat. isthm. 22.5 μ .

I. Lakes, Clifden to Roundstone.

†18. S. MEGALONOTUM, *Nord.* (*Desm. Arct.* tab. 8. fig. 38), forma, *Nord.* (*Desm. Grönl.* p. 11, tab. 7. fig. 7 et 8). (Pl. XXIII. fig. 1.)

Forma processibus apice bifidioribus.

Long. 50 μ ; lat. 46 μ ; lat. isthm. 16 μ .

I. Nacoogarrow Lough.—II. Carrantuohill.

19. STAUSTRUM AVICULA, *Bréb. in Ralfs, Brit. Desm.* p. 140, tab. 23. fig. 11.

I. Lough Shannacloontippen; Clifden; Lakes E. of Lough Bofin.—II. Carrantuohill.

††Var. VERRUCOSUM, nov. var. (Pl. XXIII. fig. 2.)

Var. membrana distincte verrucosa.

Long. 22.5–26 μ ; lat. 33–37 μ ; lat. isthm. 10 μ .

I. Derryclare Lough; Lakes east of Lough Bofin.—II. Clongerheen; Adrigole.

St. subarcuatum, Wolle, probably belongs to this species, as he surmised it might do; if so, it will fall under this variety.

20. S. FURCATUM, *Bréb. (Rabh. Fl. Europ. Alg.* iii. p. 218.)

I. Near Westport; Ballynahinch; Kylemore.—II. Lough Guitane; near Lough Brin; Castletown; Carrantuohill.

Var. ARMIGERUM, *Rabh. (Fl. Europ. Alg.* iii. p. 218.)

[*S. armigerum*, *Bréb.*]

II. Adrigole; Lower Lake of Killarney.

21. S. MONTICULOSUM, *Bréb. (Ralfs, Brit. Desm.* p. 130, tab. 34. fig. 9.)

II. Carrantuohill.

22. S. REINSCHII, *Roy.*

Forma trigona.

I. Lakes, Clifden to Roundstone; Kylemore; Ballynahinch; Roundstone; Lakes near Recess; Oorid Lough; Creggan Lough.—II. Lough Guitane; Glen Caragh; Lower Lake of Killarney.

Forma tetragona.

II. Carrantuohill.

23. S. HIRSUTUM, *Bréb. in Ralfs, Brit. Desm.* p. 127, tab. 22. fig. 3.

I. Ballynahinch; Clifden; Lakes near Recess.—II. Carrantuohill; Adrigole; Lower Lake of Killarney; Castletown.

24. *STAUROSTRUM PILOSUM*, *Arch. in Pritch. Infus.* ed. 1861, p. 739.

I. Lough Shannacloontippen; near Leenane; Ballynahinch Athry and Shindilla Loughs; near Westport.—II. Cromagloun; near Lough Brin; Castletown; Carrantuohill.

25. *S. TELIFERUM*, *Ralfs. (Brit. Desm. p. 128, tab. 22. fig. 4.)*

I. Near Westport; Ballynahinch; Athry Lough; Boy Lough; Lakes, Clifden to Roundstone; Roundstone; Lakes near Recess; Lough Anierin; Creggan Lough; Lough Shannacloontippen; Oorid Lough; Lakes east of Lough Bofin.—II. Lough Guitane; Torc Mt.; Muckcross; Upper and Lower Lakes of Killarney; Carrantuohill; Adrigole; near Lough Brin; Glengarriff; Castletown.

A zygospore of this species is figured (Pl. XXIV. fig. 5) which has six semicells attached, as if it had been produced by the conjugation of three cells instead of two.

††Forma *OBTUSA*. (Pl. XXIV. fig. 6.)

Forma spinis brevibus obtusisque.

Long. sine spin. 45 μ ; long. cum spin. 50 μ ; lat. sine spin. 39 μ ; lat. cum spin. 45 μ ; lat. isthm. 12.5 μ .

I. Lakes, Clifden to Roundstone.

†26. *S. POLYTRICHUM*, *Perty. (Rabh. Fl. Europ. Alg. iii. p. 214.) (Pl. XXII. fig. 18.)*

Long. sine spin. 59–67 μ ; long. cum spin. 70–80 μ ; lat. sine spin. 45–58 μ ; lat. cum spin. 56–70 μ ; lat. isthm. 17–21.

I. Lakes, Clifden to Roundstone.—II. Cloonee Lough.

27. *S. SPONGIOSUM*, *Bréb. (Ralfs, Brit. Desm. p. 141, tab. 23. fig. 4.)*

II. Adrigole; Carrantuohill.

††Var. *PERBIFIDUM*, nov. var. (Pl. XXIII. fig. 3.)

Var. spinis longioribus et profunde furcatis.

Long. sine spin. 42 μ ; long. cum spin. 52 μ ; lat. sine spin. 38 μ ; lat. cum spin. 52 μ ; lat. isthm. 15 μ .

I. Near Westport.

28. *S. ASPERUM*, *Bréb. in Ralfs, Brit. Desm. p. 139, tab. 22. fig. 6.*

I. Near Oughterard; Ballynahinch.—II. Carrantuohill.

29. *STAURASTRUM MAAMENSE*, *Arch.* (*Cooke, Brit. Desm.* p. 155.) [*S. pseudocrenatum, Lund, Desm. Succ.* p. 65, tab. 4. fig. 4.]

Long. 32·5–42·5 μ ; lat. 28–37·5 μ ; lat. isthm. 10–13·5 μ .

I. Ballynahinch; Derryclare Lough.—II. Adrigole.

††30. *S. TRACHYNOTUM*, nov. sp. (*S. saxonicum, Reinsch, 1867.*)

††Var. *ANNULATUM*, nov. var. (Pl. XXIV. fig. 16.)

Var. cum annulo uno granulorum magnorum ad basin semi-cellulæ.

Long. cum spin. 48 μ ; lat. cum spin. 40 μ ; lat. sine spin. 35 μ ; lat. isthm. 14 μ .

II. Carrantuohill.

As the specific name *saxonicum* was applied to a *Staurastrum* by Bulnheim in 1863, another name is needed for this species.

†31. *S. SUBSCABRUM*, *Nord.* (*Alg. Sandv.* p. 16, tab. 2. fig. 1.)

††Forma *SCABRIOR*. (Pl. XXIII. fig. 4.)

Forma membrana asperiore, præsertim ad apices.

Long. 40 μ ; lat. 35–37 μ ; lat. isthm. 10 μ .

I. Kylemore; Clifden.

††32. *S. TRACHYGONUM*, nov. sp. (Pl. XXIII. fig. 5.)

S. parvum, paulo longius quam latius, modice constrictum, sinu subaperto; semicellulæ subellipticæ apice truncatæ, spinis brevibus ad angulos apicesque præditæ (nonnullis truncatis); a vertice visæ triangulatæ, lateribus subconcavis, angulis rotundatis cum annulo spinarum brevium circa centrum glabrum.

Long. 32·5 μ ; lat. 28 μ ; lat. isthm. 7·5 μ .

I. Kylemore.

33. *S. MUTICUM*, *Bréb.* (*Ralfs, Brit. Desm.* p. 125, tab. 21. fig. 4, tab. 34. fig. 13.)

II. Lough Guitane; Adrigole.

34. *S. ORBICULARE*, *Ralfs.* (*Brit. Desm.* p. 125, tab. 21. fig. 5.)

Long. 37–41 μ ; lat. 28–37 μ ; lat. isthm. 7·5–11 μ .

I. Creggan Lough; Ballynahinch; Derryclare Lough; Lough Shindilla; Nacogarrow Lough; Letereen Lough.—II. Lough Guitane; Lower Lake of Killarney; Glen Caragh; Carrantuohill; Adrigole; Castletown.

†Var. *DEPRESSUM*, *Roy et Biss.* (*Jap. Desm.* p. 237, tab. 268. fig. 14.)

Long. $27\ \mu$; lat. $27\ \mu$; lat. isthm. $7.5\ \mu$.

I. Nacoogarrow Lough.—II. Lower Lake of Killarney; Carrantuohill; Sugar Loaf Mt.

†35. *STAURASTRUM BIENEANUM*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 200.)

II. Adrigole.

†Var. *ELLIPTICUM*, *Wille.* (*Ferskv. Alg. fr. Nov. Seml.* p. 50, tab. 13. fig. 49.)

I. Derryclare, Shannaclontippen, and Nacoogarrow Loughs; near Westport.—II. Near Lough Brin; Adrigole; Glengarriff.

††36. *S. HIBERNICUM*, nov. sp. (Pl. XXIII. fig. 6.)

S. mediocre, fere quarta parte longius quam latius, profunde constrictum, sinu lineari et angusto; semicellulæ subtrapezicæ, angulis rotundatis; a vertice visæ triangulatæ, lateribus rectis, angulis late rotundatis; membrana lævis.

Long. $65\ \mu$; lat. $52\ \mu$; lat. isthm. $18\ \mu$.

I. Near Westport.

This differs from *S. orbiculare*, Ralfs, in its much larger size, its flattened apex, and in the straight sides of the vertical view; from *S. globosum*, Roy et Biss. (*Jap. Desm.* p. 237, tab. 268. fig. 8), in its different sinus, apex, and membrane.

37. *S. KJELLMANNI*, *Wille.* (*Ferskv. Alg. fr. Nov. Seml.* p. 50, tab. 13. figs. 50-53.)

II. Glengarriff; Carrantuohill.

38. *S. PYGMÆUM*, *Bréb. in Ralfs, Brit. Desm.* p. 213, tab. 35. fig. 26.

I. Arderry Lough; Lough Aunierin; Clifden; Lakes near Recess; Oorid Lough; Nacoogarrow Lough.—II. Carrantuohill; Adrigole; near Lough Brin; Mallow.

††Var. *TRILINEATUM*, nov. var. (Pl. XXIII. fig. 7.)

Semicellulæ a fronte visæ scabriores quam forma typica, apice extremo truncatæ; a vertice visæ triangulares, angulis rotundatis et lateribus subrectis, serie subcurvata una granulorum majorum intra marginem subrectum unumquemque. Hæc var. major quam forma typica est.

Long. $48\ \mu$; lat. $40\ \mu$; lat. isthm. $15\ \mu$.

I. Nacoogarrow Lough.

This variety was as rough (if not rougher) than forma *major*, Wille (Ferskv. fr. Nov. Seml. p. 51, tab. 13. fig. 54). Rabenhorst (Flor. Europ. Alg. iii. p. 220) expresses doubt as to whether the membrane is smooth or not; Brébisson, in Ralfs, Brit. Desm. p. 213, is silent on the matter. I always find this species to be very slightly granulate.

††39. STAUSTRUM SUBPYGMÆUM, nov. sp. (Pl. XXIII. fig. 8.)

S. mediocre, circiter tam longum quam latum, profunde contractum, sinu subrectangulari extremo obtuso; semicellulæ latissime cuneatæ, ambitu glabræ, dorso subconvexæ, marginibus lateralibus leviter convexis, angulis submamillatis; a vertice visæ triangulares, lateribus subconvexis, angulis submamillatis; membrana delicate punctata.

Long. 42–45 μ ; lat. 43 μ ; lat. isthm. 16 μ .

I. Lough Aunierin.

Compare with *S. pygmæum*, Bréb., especially "forma" in Racib. Noun. Desm. Polon. p. 31, tab. 3. fig. 12.

40. *S. TURGESSENS*, *De Not.* [*S. punctulatum*, *Bréb.*, var. *turgescens* (*De Not.*), *Rabh. Fl. Europ. Alg.* iii. p. 208.]

II. Cloonee Lough.

41. *S. LANCEOLATUM*, *Arch.* (*Rabh. Fl. Europ. Alg.* iii. p. 202.)

II. Adrigole.

42. *S. INCONSPICUUM*, *Nord.* (*Norges Desm.* p. 26, tab. 1. fig. 11.)

Long. cum proc. 15–17 μ ; long. sine proc. 10–11 μ ; lat. cum proc. 11–12.5 μ ; lat. isthm. 5.5–6.5 μ .

I. Ballynahinch; Roundstone; Lakes, Clifden to Roundstone.—II. Upper and Lower Lakes of Killarney; Glengarriff; Adrigole; Castletown.

43. *S. STRIOLATUM*, *Arch.* (*Pritch. Infus.* ed. 1861, p. 740.)

Long. 22.5 μ ; lat. 19–21 μ ; lat. isthm. 10 μ .

I. Near Leenane; Roundstone; near Westport; Ballynahinch.

44. *S. MURICATUM*, *Bréb.* (*Ralfs, Brit. Desm.* p. 126, tab. 22. fig. 2.)

I. Lough Shannaclontippen[†]; near Leenane; Creggan Lough; Lakes near Recess; Ballynahinch.—II. Carrantuohill; Cloonee Lough; near Lough Brin; Lower Lake of Killarney.

††45. STAUSTRUM PYRAMIDATUM, nov. sp. [*S. muricatum*, *Bréb.*, var. *acutum*, *West (Freshw. Alg. of N. Wales*, p. 294, tab. 5. fig. 14).]

S. mediocre, quinta parte longius quam latius, sinu lineari; semicellulæ pyramidato-truncatæ, marginibus [†]lateralibus leviter convexis, apicibus truncatis et rectis vel levissime retusis; a vertice visæ triangulares, lateribus convexis, angulis late rotundatis; membrana spinis acutis irregulariter dispositis vestita.

Long. cum spin. 68 μ ; long. sine spin. 60 μ ; lat. cum spin. 55 μ ; lat. sine spin. 50 μ ; lat. isthm. 20 μ .

II. Carrantuohill.

46. *S. PUNCTULATUM*, *Bréb. in Ralfs, Brit. Desm.* p. 133, tab. 22. fig. 1.

I. Near Westport; Baheh Loughs; near Leenane; Lakes, Clifden to Roundstone; Ballynahinch; Lough Aunierin; Lakes near Recess; Lough Shannaclontippen.—II. Lower Lake of Killarney; Carrantuohill; Clogherheen.

47. *S. AMÆNUM*, *Hilse*. [*S. capitulum*, *Bréb.*, var. *amœnum*, *Rabh. Fl. Europ. Alg.* iii. p. 209.]

I. Kylemore.—II. Lower Lake of Killarney; Carrantuohill.

†Var. *BRASILIENSE*, *Boerg.* (*Desm. Brasil.* p. 950, tab. 4. fig. 44.) (Pl. XXIII. fig. 9.)

Forma seriebus duabus transversis granulorum ad basin semicellularum; a vertice visa trigona, lateribus concavis; a basi visa margine 20-crenata.

Long. 38 μ ; lat. ad bas. semicell. 20 μ ; lat. ad apic. 22 μ ; lat. isthm. 13 μ .

I. Ballynahinch.

48. *S. MERIANI*, *Reinsch.* (*Alg. Fl.* p. 160, tab. 12. fig. 1.)

Long. 40 μ ; lat. ad bas. semicell. 20 μ ; lat. ad apic. 25 μ ; lat. isthm. 14 μ .

I. Derryclare Lough.—II. Carrantuohill; 8 miles S. of Kenmare.

49. *STAUSTRUM ALTERNANS*, *Bréb. in Ralfs, Brit. Desm.* p. 132, tab. 21. fig. 7.

Long. 22 μ ; lat. 21 μ ; lat. isthm. 7.5 μ .

I. Moher Lough; Derryclare Lough; Lakes near Recess, and from Clifden to Roundstone; Lakes east of Lough Bofin; Nacoogarrow Lough; Clifden.—II. Lower Lake of Killarney; Glengarriff.

50. *S. DILATATUM*, *Ehrenb. (Ralfs, Brit. Desm.* p. 133, tab. 21. fig. 8.)

I. Creggan Lough.—II. Upper Lake of Killarney; Cloonee Lough.

†Var. *OBTUSILOBUM*, *De Not. (Nord. Fr. Wat. Alg. of New Zeal. & Austral.* p. 41, tab. 4. fig. 19.)

I. Lakes near Recess; Ballynahinch.

51. *S. LONGISPINUM*, *Arch. (Pritch. Infus. ed. 1861, p. 743.)*

Long. 97 μ ; lat. sine spin. 87 μ ; lat. cum spin. 130–135 μ ; lat. isthm. 40 μ .

I. Lough Aunierin.—II. Adrigole.

52. *S. TUMIDUM*, *Bréb. in Ralfs, Desm.* p. 126, tab. 21. fig. 6.

I. Near Westport.—II. Carrantuohill.

53. *S. BRACHIATUM*, *Ralfs. (Brit. Desm.* p. 131, tab. 23. fig. 9.)

I. Kylemore; Derryclare Lough.—II. Castletown.

54. *S. TRICORNE*, *Menegh. (Ralfs, Brit. Desm.* p. 134, tab. 22. fig. 11.)

I. Baheh Loughs.—II. Lough Guitane; Mallow; Cloonee Lough; Lower Lake of Killarney; Carrantuohill.

Var. β , *Ralfs. (Ralfs, Brit. Desm.* p. 134, tab. 34. fig. 8, b-d.)

I. Ballynahinch; Lakes, Clifden to Roundstone.—II. Muckross; Adrigole.

†Var. *SEMICIRCULARE (nob.)*. [*S. hexacerum, Wittr., var. semicirculare, Wittr. (Gotl. och Ol. Sötv. Alg.* p. 52, tab. 4. fig. 9).]

I. Derryclare Lough.

55. *STAUBASTRUM HAABOELIENSE*, *Wille.* (*Bidrag til Kunds. om Norges Ferskv. Alg.* p. 42, tab. 2. fig. 27.)

I. Ballynahinch.

56. *S. CYTOCERUM*, *Bréb. in Ralfs, Brit. Desm.* p. 139, tab. 22. fig. 10.

Forma trigona.

I. Ballynahinch; Derryclare Lough; Lough Shindilla.—II. Clogherheen.

Forma tetragona.

II. Muckcross; Adrigole.

57. *S. ARCUATUM*, *Nord.* (*Norges Desm.* p. 36, tab. 1. fig. 18.)

I. Lakes E. of Lough Bofin.—II. Near Lough Brin.

††Var. *QUITANENSE*, nov. var. (Pl. XXIII. fig. 10.)

A forma typica differt isthmo latiore, processibus brevioribus cum delicatioribus spinis ad apices processuum, prominentiis brevioribus bifidis, longitudine relative majore.

Long. sine spin. 25 μ ; lat. cum spin. 40 μ ; lat. isthm. 14 μ .

II. Lough Guitane.

58. *S. INFLEXUM*, *Arch.* (*Pritch. Infus.* ed. 1861, p. 742.)

I. Moher Lough; Nacoogarrow Lough; Ballynahinch; Clifden.—II. Lough Guitane; Lower Lake of Killarney.

59. *S. POLYMORPHUM*, *Bréb. in Ralfs, Brit. Desm.* p. 135, tab. 22. fig. 9, tab. 34. fig. 6.

Forma trigona.

I. Lakes near Recess; Ballynahinch; Lough Shannacloon-tippen.—II. Kenmare; Adrigole.

Forma tetragona.

I. Near Westport; Derryclare Lough; Moher Lough; Ballynahinch.—II. Lough Guitane; Upper Lake of Killarney; Kenmare.

Forma pentagona.

I. Derryclare Lough.—II. Carrantuohill; near Lough Brin.

†Var. *SUBGRACILE*, *Wittr.* (*Om Gotl. och Ol. Sötv. Alg.* p. 51.) [*S. crenulatum*, *Naeg.*]

Forma pentagona.

I. Derryclare Lough; Lakes E. of Lough Bofin.

60. *S. GRACILE*, *Ralfs.* (*Brit. Desm.* p. 136, tab. 22. fig. 12.)

Forma trigona.

I. Near Westport; Athry Lough; Ballynahinch; Glendalough; Shindilla and Boy Loughs; Nabincka Lough.—II. Lough Guitane; Upper Lake of Killarney; near Lough Brin; Adrigole; Cloonee Lough; Carrantuohill.

Var. NANUM, *Wille*. (*Bidrag til Kundsk. om Norges Ferskv.* p. 46, tab. 2. fig. 31.)

Forma trigona apicibus truncatis.

Long. 25 μ ; lat. 35 μ ; lat. isthm. 6 μ .

II. Upper Lake of Killarney.

Forma tetragona.

I. Nacoogarrow Lough; Lough Aunierin.—II. Adrigole.

††*BULBOSUM, nov. subsp. (Pl. XXIII. fig. 11.)

S. magnum, 1½–2plo latius quam longius (cum processibus), modice constrictum, sinu acuto; semicellulæ gracile campanulatæ; e base turgido, angulis superioribus in processibus longis deenticulatis cum apicibus bifidis attenuatis; a vertice visæ triradiatæ, serie granulorum parvorum intra marginem.

Long. 52 μ ; lat. cum proc. 95 μ ; lat. max. prope bas. semicell. 18 μ ; lat. isthm. 11 μ .

I. Derryclare Lough.

61. STAUSTRUM PARADOXUM, *Meyen*. (*Ralfs, Brit. Desm.* p. 138, tab. 23. fig. 8.)

I. Lakes near Recess; Athry and Nabincka Loughs; Roundstone; Lakes, Clifden to Roundstone; Lakes east of Lough Bofin; Ballynahinch.—II. Torc Mt.

††Forma PARVA. (Pl. XXIII. fig. 12.)

Long. cum proc. 35 μ ; long. sine proc. 16 μ ; lat. cum proc. 28 μ ; lat. isthm. 6 μ .

I. Ballynahinch.—II. Adrigole.

Var. LONGIPES, *Nord*. (*Norges Desm.* p. 35, tab. 1. fig. 17.)

I. Arderry Lough; Lough Aunierin; Derryclare Lough.—II. Torc Mt.; Cromagloun; Sugar Loaf Mt.; Cloonee Lough.

††Var. NODULOSUM, nov. var. (Pl. XXIII. fig. 13.)

Var. minor apicibus processuum leviter trifurcatis; semicellulæ a vertice visæ triangulares, lateribus binodulosis.

Long. cum proc. 33μ ; long. sine proc. 14μ ; lat. cum proc. $27.5-30 \mu$; lat. isthm. 5μ .

II. Upper Lake of Killarney.

†62. STAUSTRUM CONTORTUM, *Delp.*, var. PSEUDOTETRACERUM, *Nord.* (*Fr. Wat. Alg. of New Zeal. & Austr.* p. 37, tab. 4. fig. 9.)

I. Lakes near Recess.

††63. *S. NATATOR*, nov. sp. (Pl. XXIII. fig. 14.)

S. mediocre, circiter duabus partibus longius quam latius, modice constrictum; incisura parva et aperta; semicellulæ subquadrangulares, marginibus lateralibus leviter crenatis, verrucis mucronatis magnis tribus ad polos; angulis superioribus productis in processibus denticulatis divergentibus, apice tridentatis; a vertice visæ ellipticæ, processibus productis ad polos; projectione prominente truncata centrali in medio, seriibus duabus verrucarum subquadratarum intra marginem ordinatis; a latere visæ subrotundæ projectione mediana, processu conspecto inter verrucas binas.

Long. sine proc. 38.5μ ; long. cum proc. 67μ ; lat. ad bas. semicell. 20μ ; lat. apic. sine proc. 25μ ; lat. cum proc. 75μ ; long. proc. $30-32.5 \mu$; lat. isthm. 12.5μ ; crass. 21.5μ .

I. Derryclare Lough.

Compare with *S. brachioprominens*, Boerg. (*Desm. Brasil.* p. 952, tab. 5. fig. 52), and *S. paradoxum*, Meyen, var. *fusiforme*, Boldt. (*Siber. Chloroph.* p. 118, tab. 6. fig. 37).

††64. *S. ARCHERII*, nov. sp. (Pl. XXIII. fig. 15.)

S. magnum, subduplo longius quam latius (sine processibus), emarginatum ad medium; semicellulæ breviter cuneatæ, apice convexo glabratoque, marginibus lateralibus subrectis, angulis superioribus in processibus longissimis gracilibus radiatis denticulis productis, subcurvatis extrorsum, apicibus tridentatis; a vertice conspectæ circulares, processibus radiatis denticulatis, apicibus tridentatis; membrana glabra.

Long. (sine proc.) $69-78 \mu$; lat. cum proc. $130-140 \mu$; lat. sine proc. $43-48 \mu$; max. long. proc. 50μ ; lat. isthm. 24μ .

I. Ballynahinch; Derryclare Lough.

The vertical view of this species is similar to that of *Sl. verticillatum*, Arch. (of which I have authentic figures), but the front view is quite different.

Named in honour of Wm. Archer, the illustrious pioneer of freshwater Algal work in Ireland.

65. *STAUSTRUM CONTROVERSUM*, *Bréb.* (*Ralfs, Brit. Desm.* p. 141, tab. 23. fig. 3.)

II. Sugar Loaf Mt.; Adrigole; Castletown.

66. *S. ACULEATUM*, *Menegh.*, +**COSMOSPINOSUM*, *Boerg.* (*Bidrag til Bornh. Desm.-Flora*, p. 147, tab. 6. fig. 8.)

II. Carrantuohill.

67. *S. VESTITUM*, *Ralfs.* (*Brit. Desm.* p. 143, tab. 23. fig. 1.)

I. Ballynahinch; Arderry Lough; near Westport.—II. Upper Lake of Killarney; Adrigole; Glengarriff.

68. *S. OXYACANTHUM*, *Arch. in Pritch. Infusoria*, ed. 1861, p. 742.

Long. cum spin. 33–35 μ ; long. sine spin. 28–29 μ ; lat. cum proc. 42–43 μ ; lat. isthm. 10–12 μ .

I. Ballynahinch; Lakes, Clifden to Roundstone, and near Recess; Derryclare Lough.—II. Cromagloum; Glengarriff; Adrigole.

69. *S. SEBALDI*, *Reinsch.* (*Alg. Fl.* p. 175, tab. 11. fig. 1.)

Forma trigona.

I. Near Oughterard.

Forma tetragona.

II. Carrantuohill.

Var. *ORNATUM*, *Nord.* (*Norges Desm.* p. 34, tab. 1. fig. 15.)

I. Near Westport; Derryclare Lough; Arderry Lough.

†70. *S. PSEUDOSEBALDI*, *Wille.* (*Bidrag til Kunds. om Norges Ferskv. Alg.* p. 45, tab. 2. fig. 30.) ††**DUACENSE*, nov. subsp. (Pl. XXIV. fig. 1.)

S. mediocre, subduplo latius quam longius; semicellulæ obcuneatæ ad basin non inflatæ, apicibus verrucis bifurcatis præditæ, angulis superioribus productis in radium denticulatum rectum bifidum ad apicem, cum verruca insigni ad basin interiorem radii; a vertice visæ biradiatæ ad centrum multum inflatæ, glabræ, apicibus exhibentibus spinam unam.

Long. 32–35 μ ; lat. 55–60 μ ; lat. isthm. 11 μ ; crass. in med. 18 μ .

I. Ballynahinch Roundstone.

This subspecies differs from *Staurastrum Pseudosebaldi*, Wille, var. *bicorne*, Boldt. (Siber. Chloroph. tab. 6. fig. 36), in the straighter processes of the end view, and in the presence of the warts at the base of the bifurcate processes. It differs from *S. Pseudosebaldi*, Wille, **tonsum*, Nord. (Fr. Wat. Alg. of New Zeal. & Austr. p. 36, tab. 4. fig. 4), in the non-fusifiform shape of the end view as well as in the not reduced apical warts.

†71. STAUSTRUM MANFELDTII, *Delp.* (*Desm. Subalp.* p. 160, tab. 13. fig. 12.)

Long. 46 μ ; lat. cum proc. 77 μ ; lat. isthm. 10 μ .

I. Ballynahinch.

72. S. ANATINUM, *Cooke et Wills.* (*Grevillea*, 1880, p. 92, tab. 139. fig. 6.)

Long. 55 μ ; lat. (cum proc.) 75–85 μ ; lat. isthm. 18 μ .

I. Ballynahinch; Arderry Lough; Lakes east of Lough Bofin; Oorid Lough; Lakes, Clifden to Roundstone.—II. Upper Lake of Killarney; Glen Caragh; Adrigole; Sugar Loaf Mt.; 8 miles S. of Kenmare.

††Var. TRUNCATUM, nov. var. (Pl. XXIV. fig. 2.)

Var. cum apicibus semicellularum truncatis et verrucis minoribus; angulis contractis ad bases radiorum.

Long. 58–65 μ ; lat. cum proc. 95–100 μ ; lat. isthm. 18–20 μ .

II. Lough Guitane.

††* BIRADIATUM, nov. subsp. (Pl. XXIV. fig. 3.)

S. submagnum, duplo latius quam longius (cum processibus), profunde constrictum, sinu sublineari; semicellulæ obverse elliptico-semicirculares, lateribus subverrucosis, angulis (superioribus) in processibus robustis rectis granulatis productis, apice trifidis, dorso levissime convexo, verrucis numerosis emarginato-bifidis, serie verrucarum similarum intra marginem; a vertice visæ fusiformes, utrinque verrucis numerosis emarginato-bifidis instructis, serie una verrucarum similarum intra marginem unumquemque, processibus granulatis apicibus trifurcatis.

Long. 40 μ ; lat. cum proc. 82 μ ; lat. isthm. 8 μ ; crass. 23 μ .

I. Lakes near Recess.

73. S. EUSTEPHANUM, *Ralfs.* (*Brit. Desm.* p. 215.)

I. Lakes, Clifden to Roundstone; Ballynahinch.—II. Glen Caragh.

74. *STAURASTRUM FURCIGERUM*, *Bréb.* [*Didymocladum furcigerum* (*Bréb.*), *Ralfs, Brit. Desm.* p. 144, tab. 33. fig. 12.]

Long. cum proc. 60–75 μ ; long. sine proc. 37·5–40 μ ; lat. cum proc. 50–67 μ ; lat. isthm. 14–16 μ .

I. Lakes near Recess; Arderry and Creggan Loughs; Ballynahinch.—II. Glen Caragh.

75. *S. ARCTISCON*, *Lund.* (*Desm. Suec.* p. 70, tab. 4. fig. 8.)

I. Lakes east of Lough Bofin.

76. *S. LÆVE*, *Ralfs.* (*Brit. Desm.* p. 131, tab. 23. fig. 10.)

II. Adrigole.

77. *S. SEXCOSTATUM*, *Bréb.* (*Ralfs, Brit. Desm.* p. 129, tab. 23. fig. 5.)

II. Lough Guitane; Adrigole.

78. *S. MARGARITACEUM*, *Menegh.* (*Ralfs, Brit. Desm.* p. 134, tab. 21. fig. 9.)

Forma tetragona.

I. Near Westport; Roundstone; Kylemore; Oorid Lough; near Oughterard; Lakes, Clifden to Roundstone and near Recess.—II. Lough Guitane; Cromagloun; Lower Lake of Killarney; Glen Caragh; Carrantuohill; Castletown.

Forma pentagona.

I. Kylemore; Ballynahinch; Lakes, Clifden to Roundstone.—II. Carrantuohill; Sugar Loaf Mt.; Lower Lake of Killarney; Glen Caragh.

Forma hexagona.

I. Kylemore.

†Var. *HIRTUM*, *Nord.* (*De Alg. et Char.* i. p. 11, tab. 16. fig. 18.)

II. Castletown; Carrantuohill.

††79. *S. ARACHNOIDES*, nov. sp. (Pl. XXIV. fig. 4.)

S. mediocre, modice constrictum, sinu lato et obtuso; semi-cellulæ late campanulatæ, apicibus truncatis granulis emarginatis præditis, processibus longis gracillimis denticulatis leviter incurvatis ad angulos superiores, apicibus tridenticulatis; a vertice visæ annulo granulorum novem intra marginem, pentaradiatæ, processibus longis attenuatis subflexis.

Long. $37\ \mu$; lat. cum proc. $67-71\ \mu$; lat. sine proc. $20\ \mu$;
long. proc. $25-27\ \mu$; lat. isthm. $9\ \mu$.

I. Lakes, Clifden to Roundstone.

80. *STAURASTRUM ARACHNE*, *Ralfs.* (*Brit. Desm.* p. 136,
tab. 23. fig. 6.)

Long. $2\ \mu$; lat. cum. proc. $48-52\ \mu$; lat. sine proc. $17.5-20\ \mu$;
lat. isthm. $9\ \mu$.

I. Derryclare Lough; Lakes, Clifden to Roundstone; Ballynahinch; Athry Lough.—II. Adrigole.

81. *S. TETRACERUM*, *Ralfs.* (*Brit. Desm.* p. 137, tab. 23.
fig. 7.)

I. Near Westport; Ballynahinch; Lakes, Clifden to Roundstone; Athry Lough; Derryclare Lough; Lough Aunierin; near Oughterard; Lough Shannaclontippen; Roundstone; Lakes near Recess; Letereen Lough.—II. Lough Guitane; Cromagloun; Torc Mt.; Muckcross; Glengarriff; Upper and Lower Lakes of Killarney; near Lough Brin; Adrigole; Castle-town.

†*FORMA TRIGONA*, *Lund.* (*Desm. Succ.* p. 69.)

Long. sine proc. $11\ \mu$; long. cum proc. $32\ \mu$; lat. cum proc. $30\ \mu$; lat. isthm. $5.5\ \mu$.

I. Athry Lough; Lakes, Clifden to Roundstone; Ballynahinch; near Westport.—II. Muckcross; Clogerheen; Glen Caragh; Glengarriff; near Lough Brin.

Class CÆNOBIEÆ.

Ord. VOLVOCINEÆ.

1. *EUDORINA ELEGANS*, *Ehrenb.* (*Rabh. Fl. Europ. Alg.* iii.
p. 98.)

I. Lakes, Clifden to Roundstone.

Ord. PANDORINEÆ.

1. *PANDORINA MORUM*, *Ehrenb.* (*Rabh. l. c.* p. 99, fig. 49.)

I. Near Westport; Bahel Loughs.—II. Upper Lake of Killarney.

1. *GONIUM PECTORALE*, *Muell.* (*Rabh. l. c.* p. 99.)

I. Moher Lough.—II. Upper Lake of Killarney.

Ord. PEDIASCREÆ.

1. PEDIASTRUM ANGULOSUM, *Ehrnb. (Ralfs, Brit. Desm. p. 187, tab. 31. fig. 11.)*
 - I. Nacoogarrow Lough; Shindilla Lough.

2. P. BORYANUM, *Menegh. (Ralfs, Brit. Desm. p. 187, tab. 31. fig. 9.)*
 - I. Near Westport; Ballynahinch.—II. Lough Guitane; Clogerheen; Kenmare; Mallow.
 - Var. GRANULATUM, *Rabh. (Fl. Europ. Alg. iii. p. 75.)*
 - I. Near Westport; Lakes, Clifden to Roundstone; Creggan Lough.—II. Lower Lake of Killarney.

3. P. BIDENTULUM, *A. Br. (Rabh. Fl. Europ. Alg. iii. p. 77.)*
 - I. Lough Shannaclontippen; Baheh Loughs.

4. P. CONSTRICTUM, *Hass. [P. ellipticum, Ralfs, Brit. Desm. p. 188, tab. 31. fig. 10.]*
 - II. Lower Lake of Killarney.

5. P. PERTUSUM, *Kuetz. (Ralfs, Brit. Desm. p. 185, tab. 31. fig. 6 d.)*
 - I. Moher Lough; Derryclare and Creggan Loughs; Lough Shannaclontippen.—II. Upper and Lower Lakes of Killarney.

6. P. TETRAS, *Ralfs. [P. Ehrenbergii, A. Br.]*
 - Forma a. Dispositio cellularum 4.
 - I. Lakes, Clifden to Roundstone; Clifden; Derryclare Lough; Lough Aunierin; Lough Shannaclontippen.—II. Lough Guitane; Upper and Lower Lakes of Killarney; near Lough Brin; Glengariff; Cloonee Lough; Mallow.
 - Forma c. Dispositio cellularum 1+7.
 - I. Derryclare, Baheh, and Shindilla Loughs; Lough Shannaclontippen; Clifden; Lakes E. of Lough Bofin.—II. Glen Caragh; Adrigole; near Lough Brin.
 - Forma d. Dispositio cellularum 5+11.
 - II. Glen Caragh.

7. P. INTEGRUM, *Naeg. (Rabh. Fl. Europ. Alg. iii. p. 71.)*
 - II. Lower Lake of Killarney.

Ord. SORASTRÉE.

1. SELENASTRUM BIBRAIANUM, *Reinsch.* (*Alg. Fl.* p. 64.)
I. Near Oughterard.
1. SORASTRUM SPINULOSUM, *Naeg.* (*Rabh. Fl. Europ. Alg.* iii. p. 81.)
I. Lough Aunierin; Derryclare Lough; Ballynahinch.—II. Lough Guitane; Kenmare.
- †1. STAUROGENIA HETEROCANTHA, *Nord. in Wittr. et Nord. Alg. Exsic.* no. 451.
I. Derryclare Lough.
2. S. RECTANGULARIS, *A. Br.* (*Rabh. Fl. Europ. Alg.* iii. p. 80.)
I. Lough Shannaclontippen; Clifden.—II. Kenmare; Lower Lake of Killarney; Castletown.
1. CÆLASTRUM SPHÆRICUM, *Naeg.* [C. Nägeli, *Rabh. Fl. Europ. Alg.* iii. p. 79, pro parte.]
I. Near Westport.
2. C. CAMBRICUM, *Arch.* (*Cooke, Brit. Fr. Wat. Alg.* p. 46; *Wolle, Fr. Wat. Alg. U. S.* p. 170, tab. 156. fig. 5.)
I. Loughs Shannaclontippen and Aunierin.—II. Glengarriff.
3. C. CUBICUM, *Naeg.* [C. Nägeli, *Rabh. Fl. Europ. Alg.* iii. p. 79, pro parte.]
I. Ballynahinch.
- †4. C. VERRUCOSUM, *Reinsch.* (*Contrib. ad Alg. et Fung.* taf. 13. fig. 8; *Contrib. ad Flor. Alg. ag. dulc. Promont.* pl. 6. fig. 3.)
II. Adrigole.
5. C. MICROPORUM, *Naeg.* (*Rabh. Fl. Europ. Alg.* iii. p. 80.)
I. Near Westport; Ballynahinch; Nacoogarrow Lough.—II. Upper and Lower Lakes of Killarney; Adrigole.

II. PROTOPHYTA.

Group *SCHIZOPHYCEÆ*.

Class PROTOCOCCOIDEÆ.

Ord. EREMOBIÆ.

1. *SCIADIUM ARBUSCULA*, *A. Br.* [*Ophiocytium arbuscula*, *Rabh. Fl. Europ. Alg.* iii. p. 68.]

I. Near Westport.

1. *OPHIOCYTIUM COCHLEARE*, *A. Br.* (*Rabh. l. c.* p. 67.)

I. Roundstone; near Westport; near Oughterard; Lakes near Recess; Ballynahinch; Letereen Lough; Lough Shannacloontippen.—II. Carrantuohill; Lower Lake of Killarney; Glen Caragh.

1. *DICTYOSPHÆRIUM EHRENBORGIANUM*, *Naeg.* (*Rabh. l. c.* p. 47.)

I. Lough Aunierin; Ballynahinch.—II. Castletown; Glen Caragh.

1. *APIOCYSTIS BRAUNIANA*, *Naeg.* (*Rabh. l. c.* p. 43.)

I. Near Westport.—II. Lower Lake of Killarney, on *Ædognonium*, sp.

1. *HYDRIMUM HETEROMORPHUM*, *Reinsch.* (*Contrib. ad Algol.* p. 80, tab. 11. fig. 3.)

I. Kylemore; Ballynahinch.—II. Carrantuohill; Lower Lake of Killarney; Glen Caragh; near Lough Brin; Adrigole.

1. *NEPHROCYTIUM AGARDHIANUM*, *Naeg.*

I. Lakes, Clifden to Roundstone; Boy Lough.—II. Muckcross.

2. *N. NAGELII*, *Grun.* (*Rabh. Fl. Europ. Alg.* p. 52.)

II. Glengariff; Lower Lake of Killarney.

1. *OOCYSTIS GIGAS*, *Arch.* (*Quart. Journ. Micr. Sc.* 1877, p. 105.)

I. Lough Shannacloontippen.

†2. OOCYSTIS NÄGELII, *A. Br.* (*Rabh. Fl. Europ. Alg.* iii. p. 53.)

II. 8 m. S. of Kenmare.

†3. O. SOLITARIA, *Wittr. in Nord. et Wittr. Alg. Exsic.* no. 244.

I. Clifden.

Ord. PROTOCOCCACEÆ (incl. *Palmellaceæ*.)

1. PORPHYRIDIDIUM CRUENTUM, *Naeg.* (*Rabh. Fl. Europ. Alg.* iii. p. 397.)

II. Castletown.

1. PLEUROCOCCUS VULGARIS, *Menegh.* (*Rabh. l. c.* p. 24.)

I. Common.—II. Common.

2. P. ANGULOSUS, *Menegh.* (*Rabh. l. c.* p. 24.)

Crass. cell. 10–15 μ ; crass. membr. cell. 1.5–2.5 μ .

I. Near Westport.

†1. ACANTHOCOCCUS ACICULIFERUS, *Lagerh.* (*Bidrag till Sver. Alg. Fl.* tab. 1, fig. 21.)

Diam. sine acul. 20 μ ; diam. cum acul. 26 μ ; long. acul. 3 μ .

II. Cromagloun.

†2. A. sp. (Pl. XVIII. fig. 14.)

A. cellulis solitariis vel in familiis parvis conglomeratis, globosis; membrana cellularum crassa, aciculis validis brevibus numerosissimis ornata.

Diam. (sine acul.) 34–42 μ ; long. ac. 3–4 μ .

Burren Hills, Co. Clare.

1. CHLOROCOCCUM GIGAS, *Grun.* (*Rabh. Fl. Europ. Alg.* iii. p. 59.)

I. Near Westport; Lakes, Clifden to Roundstone; Oorid Lough.—II. Lough Guitane.

††Var. MAXIMUM, nov. var. (Pl. XVIII. fig. 13.)

Var. cellulis majoribus, fere quatuor in familiam tetraëdrice ordinatis.

Diam. cell. 22–28 μ .

I. Derryclare Lough.

2. *CHLOROCOCCUM HUMICOLA*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 58.)

II. Lough Guitane.

1. *GLÆOCYSTIS AMPLA*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 29.)

I. Lough Aunierin; near Recess; Creggan Lough; Lakes, Clifden to Roundstone; Lakes east of Lough Bofin; Lough Shannacloontippen; near Westport.—II. Near Lough Brin; Adrigole.

2. *G. RUPESTRIS*, *Rabh.* (*L. c.* p. 30.)

I. Lough Shannacloontippeu; Derryclare Lough.—II. Near Killarney.

3. *G. VESICULOSA*, *Naeg.* (*Rabh. l. c.* p. 29.)

Diam. cell. 7–9 μ .

I. Derryclare Lough; Roundstone; Oorid and Nabinecka Loughs.—II. Upper Lake of Killarney; Carrantuohill; near Lough Brin; 8 m. S. of Kenmare.

4. *G. BOTRYOIDES* (*Kuetz.*), *Naeg.* (*Rabh. l. c.* p. 30.)

I. Derryclare Lough.

1. *EREMOSPHERA VIRIDIS*, *De Bary.* (*Rabh. Fl. Europ. Alg.* iii. p. 24.)

I. Lough Creggan; Lakes near Recess.—II. Cromagloun; Clogherheen; Lower Lake of Killarney; Castletown; Adrigole.

††1. *BOTRYOCOCCUS CALCAREUS*, nov. sp. (Pl. XVIII. fig. 6.)

B. thallo minimo subgloboso circiter 32 cellularum, libere natantium vel in massas parvas aggregatarum; cellulis ovato-cuneatis, polo latiore subemarginato et polo angustiore verso medio thalli.

Diam. fam. 30–55 μ ; long. cell. 9–12.5 μ ; lat. cell. 10–12.5 μ ; crass. cell. 7.5–10 μ .

Frequent amongst *Spirogyra* in small limestone pools on the Burren Hills, Co. Clare.

This differs from *B. Braunii*, *Kuetz.*, in the *very different* shape of the cells and in not having them so densely packed.

2. *B. BRAUNII*, *Kuetz.* (*Rabh. Fl. Europ. Alg.* iii. p. 43.)

I. Near Oughterard; Lakes, Clifden to Roundstone.—II. Cromagloun; Carrantuohill; Lower Lake of Killarney; Castletown; Glen Caragh; 8 m. S. of Kenmare.

1. *UROCOCCUS INSIGNIS*, *Kuetz.* [*Chroococcus macrococcus*, *Rabh.*, et var. *aureus*, *Rabh.* (*Fl. Europ. Alg.* ii. p. 33).]

I. Lough Aunierin; Lakes, Clifden to Roundstone; Ballynahinch.—II. Carrantuohill.

1. *RHAPHIDIUM POLYMORPHUM*, *Fresen.*, var. *ACICULARE* (*A. Br.*), *Rabh.* (*Fl. Europ. Alg.* iii. p. 45.)

II. Lower Lake of Killarney.

Var. *FALCATUM*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 45.)

I. Near Westport; Creggan Lough; Babehe Loughs; Ballynahinch; Lough Shannaclontippen; Lakes, Clifden to Roundstone.—II. Lough Guitane; Cromagloun; Muckcross; Upper and Lower Lakes of Killarney; Glen Caragh; near Lough Brin; Carrantuohill.

1. *SCENEDESMUS BIJUGATUS*, *Kütz.* [*Scenedesmus obtusus*, *Meyen*; *S. quadricauda*, *Turp.*, var. *ecornis* (*Ehrenb.*), *Ralfs* (*Brit. Desm.* p. 190, tab. 31. fig. 12 *h* et *i*).]

I. Near Westport; Clifden; Lough Shannaclontippen.—II. Lough Guitane; Upper Lake of Killarney.

†2. *S. ALTERNANS*, *Reinsch.* (*Alg. Fl.*)

I. Lough Shannaclontippen; near Oughterard; near Recess; Clifden.—II. Carrantuohill; Adrigole.

†3. *S. DENTICULATUS*, *Lagerh.* (*Bg. till Stockh. Pediatr.*, *Protococc. och Palmell.* p. 61, tab. 2. figs. 13–16.)

Long. cell. 12·5–14 μ ; crass. cell. 7·5–9 μ .

I. Ballynahinch; Lough Shannaclontippen.

††Var. *LINEATUS*, nov. var. (Pl. XVIII. fig. 7.)

Var. *cellulis oblongis angustioribus et in unam seriem ordinatis, nec cruciatim nec alternatim; cum 2–3 dentibus parvis.*

Long. cell. 10–11 μ ; crass. cell. 2·5–4 μ .

I. Derryclare Lough.

4. *S. QUADRICAUDA*, *Bréb.* (*Ralfs, Brit. Desm.* p. 190, tab. 31. fig. 12 *a–f.*)

I. Babehe Loughs; Lough Aunierin; Ballynahinch; near Westport; Derryclare Lough; Creggan Lough; Lough Shannaclontippen.—II. Lough Guitane; Lower Lake of Killarney; Clogherheen.

Var. ABUNDANS, *Kirchn.* [*S. quadricauda*, *Bréb.*, var. β , *Ralfs* (*Brit. Desm.* p. 190, tab. 31. fig. 12 *g*).]

I. Lough Shannaclontippen.—II. Lower Lake of Killarney.

5. SCENEDESMUS ANTENNATUS, *Bréb.*, in *Ralfs*, *Brit. Desm.* p. 222, tab. 35. fig. 27.

I. Creggan Lough; Boy Lough; near Oughterard; Lough Shannaclontippen.—II. Lough Guitane.

6. *S. ACUTUS*, *Meyen.* (*Ralfs*, *Brit. Desm.* p. 191, tab. 31. fig. 14.)

I. Near Westport; Lakes E. of Lough Bofin; Ballynahinch; Derryclare Lough; Letereen, Shindilla, Nabincka, and Aunierin Loughs; Lakes, Clifden to Roundstone.—II. Lough Guitane; Upper and Lower Lakes of Killarney; Clogerheen; Glengarriff; Cloonee Lough; Adrigole; near Lough Brin.

Var. OBLIQUUS, *Rabh.* (*Fl. Europ. Alg.* iii. p. 64.) [*S. obliquus*, *Kuetz.*]

I. Creggan, Derryclare, and Nabincka Loughs; Letereen Lough.—II. Carrantuohill.

Var. DIMORPHUS, *Rabh.* (*l. c.*). [*S. dimorphus*, *Kuetz.*]

I. Lough Shannaclontippen.—II. Lough Guitane.

†1. POLYEDRIUM MINIMUM, *A. Br.* [*P. Pinacidium*, *Reinsch.*]

I. Lakes, Clifden to Roundstone; Oorid Lough; Derryclare Lough.

2. *P. TETRAËDRICUM*, *Naeg.* (*Rabh. Fl. Europ. Alg.* iii. p. 62.) (Pl. XVIII. fig. 15.)

Lat. 30–35 μ .

I. Moher Lough.—II. Lower Lake of Killarney.

†3. *P. CAUDATUM*, *Lagerh.* (*Bidrag till Sver. Alg. Fl.*) [*P. pentagonum*, *Reinsch.*]

I. Near Westport; Lakes east of Lough Bofin.

4. *P. LONGISPINUM*, *Rabh.* (*Fl. Europ. Alg.* iii. p. 62.)

I. Bahch Loughs.

5. *P. ENORME*, *De Bary.* (*L. c.* p. 63.)

I. Near Westport.—II. Cromagloun; Sugar Loaf Mt.; near Lough Brin; Castletown; Glengarriff.

Class CYANOPHYCEÆ OR PHYCOCHROMACEÆ.

Subclass NOSTOCHINEÆ.

Ord. NOSTOCACEÆ.

1. NOSTOC SPHÆRICUM, *Vauch.* (*Rabh. Fl. Europ. Alg.* ii. p. 167.)

Diam. thall. 2·5–7 mm.; diam. cell. veget. 4–4·5 μ ; diam. heterocyst. 6–7·5 μ .

II. Torc Mt.

1. CYLINDROSPERMUM MACROSPERMUM, *Kuetz.* (*Rabh. l. c.* p. 186.)

II. Muckross.

††1. ANABÆNA (SPHÆROZYGA) ORTHOGONA, nov. sp. (Pl. XVIII. fig. 8.)

A. trichomatibus subrectis, dispersis, dissepimentis constrictis, pallide ærugineis, articulis subquadratis; heterocystidibus globosis; sporis geminis vel singulis, magnis subrectangularibus diametro 3–4plo longioribus, membranis hypopachydermaticis.

Diam. cellularum veget.....	5 μ ;
„ heterocystidum	6–7·5 μ ;
crassit. sporarum adularum.....	10–12 μ ;
long. „ „	30–38 μ .

II. In peaty pools north of Cromagloun.

The vegetative cells generally appear distinct from each other, being apparently connected by the mucilage; the decidedly truncate spores, which are fully twice the diameter of the vegetative cells, are characteristic.

2. A. HASSALLII, *Wittr.* [*Sphærozyga Hassallii*, *Rabh. l. c.* p. 195.]

Long. cell. veget. 7·5–10 μ ; crass. cell. veget. 5·5–7 μ ; long. spor. adult. 17·5–22·5 μ ; crass. spor. adult. 7–8 μ .

I. Near Westport.

Ord. RIVULABIACEÆ.

1. CALOTHRIX DILLWYNI, *Cooke.* (*Brit. Freshw. Alg.* p. 276, tab. 113. fig. 2.)

II. Cloonee Lough.

1. RIVULARIA CALCAREA, *Sm. Eng. Bot.* (tab. 1799).
I. Near Westport.
2. R. GRANULIFERA, *Carm. (Cooke, Br. Freshw. Alg.* pl. 115. fig. 1.)
Diam. trich. 4–12 μ .
II. Tore Mt.
3. R. ECHINATA, *Cooke. (Cooke, l. c.* tab. 114. fig. 2.)
I. Lakes near Recess.

Ord. SCYTONEMACEÆ.

1. TOLYPOTHRIX AEGAGROPILA, *Kuetz. (Rabh. Fl. Europ. Alg.* ii. p. 274.)
Articulis diametro paulo longioribus.
Diam. trich. cum vag. 15 μ .
I. Lakes, Clifden to Roundstone.
2. T. PYGMEA, *Kuetz. (Rabh. l. c.* p. 275.)
Diam. trich. 8–10 μ ; long. heterocyst. 8·5–10 μ ; crass. heterocyst. 6·5–8·5 μ .
I. Lakes, Clifden to Roundstone.
A small form (diam. trich. 6·5–7 μ) with single heterocysts was noticed which may belong to *T. tenuis*, *Kuetz.*
I. Athry Lake.
1. PETALONEMA ALATUM, *Berk. [Arthrosiphon alatus (Grev.), Rabh. l. c.* p. 265.]
I. Ballynahinch.
- †1. SCYTONEMA CALOTRICHOIDES, *Kuetz. (Rabh. Fl. Europ. Alg.* ii. p. 253.)
Lat. sine vag. 12·5–13 μ ; lat. cum vag. 17–20 μ .
II. 8 m. S. of Kenmare.
A form with the branchlets both geminate and single, they were also frequent; the heterocysts differed from those of the type in being retund-elliptic.
Lat. trich. sine vag. 7–8 μ ; cum vag. 9–11 μ .
II. Cromagloun.
2. S., sp.
Diam. trich. 12–15 μ ; cum vag. 23–25 μ .

This *Scytonema* approaches large forms of *S. tolypotrichoides*, Kuetz., but it has a comparatively thicker internal trichome; it was only seen in small quantity.

II. Upper Lake of Killarney.

1. *STIGONEMA MINUTUM*, Hass. [*Sirosiphon saxicola*, Naeg.] (*Cooke, Brit. Freshw. Alg.* p. 273, pl. 110. fig. 1.)

Diam. trich. cum vag. 20–28 μ ; diam. trich. sine vag. 15–18 μ .

I. Athry Lake.—II. Cloonee Lough.

2. *S. TURFACEUM*, Cooke. (*Brit. Freshw. Alg.* p. 272, tab. 111. fig. 2.)

II. 8 m. S. of Kenmare.

The last two are probably Lichens when mature.

Ord. OSCILLARIACEÆ.

1. *OSCILLARIA PRINCEPS*, Vauch. (*Rabh. Fl. Eur. Alg.* ii. p. 112.)

Lat. 30–32 μ .

I. Near Westport.—II. Sugar Loaf Mt.; Adrigole; Castletown; Glengarriff.

2. *O. FROLICHI*, Kuetz. (*Rabh. Fl. Europ. Alg.* ii. p. 109; *Cooke's Brit. Freshw. Alg.* p. 253, tab. 97. fig. 7.)

I. Creggan Lough.

3. *O. NIGRO-VIRIDIS*, Thw. (*Rabh. Fl. Europ. Alg.* ii. p. 292; *Cooke's Brit. Freshw. Alg.* p. 252, tab. 98. fig. 2.)

Lat. fil. 12.5 μ .

I. Near Westport.

4. *O. LIMOSA*, Ag. (*Rabh. Fl. Europ. Alg.* ii. p. 104; *Cooke's Brit. Freshw. Alg.* p. 251, tab. 97. fig. 3.)

II. Cloonee Lough; Carrantuohill.

5. *O. TENUIS*, Ag. (*Rabh. Fl. Europ. Alg.* ii. p. 102; *Cooke's Brit. Freshw. Alg.* p. 249, tab. 96. fig. 8.)

II. Castletown; Carrantuohill; Mallow.

6. *O. LEPTOTRICHA*, Kuetz. (*Rabh. Fl. Europ. Alg.* ii. p. 96; *Cooke's Brit. Freshw. Alg.* p. 247, tab. 96. fig. 5.)

Lat. fil. 3 μ .

I. Near Westport.

7. *OSCILLARIA TENERRIMA*, *Kuetz.* (*Rabh. Fl. Eur. Alg.* ii. p. 96; *Cooke, Brit. Freshw. Alg.* p. 247, tab. 96. fig. 4.)

I. Derryclare Lough.—II. Carrantuohill.

1. *MICROCOLEUS MÜLLERII*, *nob.* [*Schizothrix Müllerii*, *Naeg.* (*Rabh. Fl. Europ. Alg.* ii. p. 269).]

Diam. trich. 9–12 μ ; diam. vag. 30 μ .

II. Lower Lake of Killarney.

1. *LYNGBYA SUBFUSCA*, *Cooke.* (*Brit. Freshw. Alg.* p. 262, tab. 101. fig. 3.)

I. Moher Lough.

†1. *SPIRULINA TURFOSA*, *Cram.* (*Hedwigia*, ii. p. 61, tab. 12. fig. 1.)

Diam. trich. 4·5–5 μ .

I. Near Westport.

2. *S. TENUISSIMA*, *Kuetz.* (*Rabh. Fl. Europ. Alg.* ii. p. 92.)

I. Near Westport.

Subclass CHROOCOCCACEÆ.

Ord. CHROOCOCCACEÆ.

1. *CHROOCOCCUS TURGIDUS*, *Naeg.* (*Rabh. Fl. Europ. Alg.* ii. p. 32.)

I. Near Westport; Kylemore; Clifden; Ballynahinch.—II. Torc Mt.; Glen Caragh.

2. *C. COHÆRENS*, *Naeg.* (*Cooke, Brit. Freshw. Alg.* p. 204, pl. lxxxiii. fig. 1.)

I. Derryclare Clough; Boy Lough.

1. *GLÆOCAPSA ÆRUGINOSA*, *Kuetz.* (*Rabh. Fl. Eur. Alg.* ii. p. 39; *Cooke, Brit. Freshw. Alg.* p. 207, tab. 84. fig. 2.)

II. Carrantuohill.

2. *G. MAGMA*, *Kuetz.* (*Rabh. Fl. Eur. Alg.* ii. p. 42; *Cooke, Brit. Freshw. Alg.* p. 208, tab. 84. fig. 3.)

II. Torc Mt.

3. *G. RUPICOLA*, *Kuetz.* (*Rabh. Fl. Eur. Alg.* ii. p. 43; *Cooke, Brit. Freshw. Alg.* p. 208, tab. 84. fig. 4.)

II. Near Killarney.

1. *SYNECHOCOCCUS ÆRUGINOSUS*, Naeg. (*Rabh. Fl. Eur. Alg.* ii. p. 59.)

Long. 32–37 μ ; lat. 21–24 μ .

I. Lough Aunierin; Lakes near Recess; near Westport.—

II. Lough Guitane; Carrantuohill; Adrigole; 8 m. S. of Kenmare.

†1. *MERISMOPEDIA ÆRUGINEA*, Bréb. (*Rabh. l. c.* p. 57.)

Crass. cell. 4.5–6 μ .

I. Lakes, Clifden to Roundstone.

2. *M. GLAUCA*, Naeg. (*Rabh. l. c.* p. 56.)

I. Near Westport; Lough Aunierin; Lakes near Recess; Shindilla, Nabincka, and Derryclare Loughs; Letereen Lough; Ballynahinch; Boy Lough.—II. Lough Guitane; Castletown; Upper Lake of Killarney; Adrigole.

3. *M. VIOLACEA*, Kuetz. (*Rabh. l. c.* p. 57.)

II. Cloonee Lough.

†4. *M. IRREGULARE*, Lagerh. (*Bidrag til Sver. Alg. Fl.* tab. 1. figs. 5 et 6.)

I. Arderry Lough.

1. *TETRAPEDIA SETIGERA*, Arch. (*Grevillea*, i. p. 46, tab. 3. figs. 14–17.)

Diam. sine spin. 7.5 μ ; long. spin. 6 μ ; crass. 5 μ .

I. Kylemore.

1. *APHANOCAPSA GREVILLEI*, Rabh. (*Fl. Europ. Alg.* ii. p. 50.)

A form with the cellules more densely crowded than usual.

II. Cromagloun; Tore Mt.

††Var. *MICROGRANULA*, nov. var. (Pl. XVIII. fig. 9.)

Var. cellulis multum minoribus et confertioribus.

Crass. cellulæ 2–2.5 μ .

I. In pools, free swimming, near Ballynahinch.

†1. *GLAUCOCYSTIS NOSTOCHINEARUM*, Itz. (*Rabh. Fl. Europ. Alg.* iii. Addenda &c. p. 417, c. fig.)

II. Near Lough Brin; Carrantuohill; Glen Caragh.

1. *MICROCYSTIS MARGINATA*, *Kirchn.* (*Cooke, Brit. Freshw. Alg.* p. 212, pl. lxxxvi. fig. 6.)

I. Lough Shannacloontippen.—II. Cromagloun.

2. *M. PROTOGENITA*, *Rabh.* (*Fl. Europ. Alg.* ii. p. 52.)

I. Creggan Lough ; Shannacloontippen, Boy, Nabineka, and Oorid Loughs.—II. Lough Guitane ; Upper and Lower Lakes of Killarney ; Glengarriff ; Cloonee Lough ; Adrigole.

†1. *APHANOTHECE SAXICOLA*, *Naeg.* (*Rabh. l. c.* p. 63.)

I. Nacoogarrow Lough ; Loughs Aunierin and Creggan.—II. Carrantuohill.

1. *CÆLOSPHÆRIUM KUETZINGIANUM*, *Naeg.* (*Rabh. l. c.* p. 55.)

I. Aunierin and Oorid Loughs ; Shindilla Lough.

Class DIATOMACEÆ.

1. *CYCLOTELLA OPERCULATA*, *Kuetz.* (*W. Sm. Brit. Diat.* i. fig. 48.)

I. Derryclare Lough ; Nacoogarrow Lough ; Shindilla Lough ; Clifden.—II. Tore Mt. ; Lough Guitane ; Lower Lake of Killarney.

2. *C. KUETZINGIANA*, *Thw.* (*W. Sm. l. c.* fig. 47.)

I. Near Westport ; Roundstone.—II. Lough Guitane.

1. *MELOSIRA VARIANS*, *Ag.* (*W. Sm. Brit. Diat.* ii. p. 57, tab. 51. fig. 332.)

II. Lower Lake of Killarney ; Carrantuohill ; Mallow.

2. *M. ARENARIA*, *Moore.* [*Orthosira arenaria*, *W. Sm. l. c.* p. 59, tab. 52. fig. 334.]

II. Clogerheen.

1. *SUBIRELLA LINEARIS*, *W. Sm.* (*Brit. Diat.* i. p. 31, fig. 58 a.)

I. Near Westport ; Lakes near Recess.—II. Lough Guitane Lower Lake of Killarney ; Glengarriff.

Var. *CONSTRICTA*, *Rabh.* (*Fl. Europ. Alg.* i. p. 52.)

II. Lough Guitane.

2. *S. BISERIATA*, *Bréb.* (*W. Sm. Brit. Diat.* i. p. 30, fig. 57.)

I. Near Westport ; Lakes E. of Lough Bofin.—II. Glen Caragh ; near Lough Brin ; Glengarriff.

3. *SUBIRELLA APICULATA*, *W. Sm.* (*Rabh. Fl. Europ. Alg.* i. p. 54.)

I. Moher Lough ; Lakes E. of Lough Bofin.—II. Glengarriff.

4. *S. SPLENDIDA*, *Kuetz.* (*W. Sm. Brit. Diat.* p. 32, tab. 7. fig. 62.)

I. Creggan and Derryclare Loughs ; Lakes E. of Lough Bofin.

5. *S. NOBILIS*, *W. Sm.* (*L. c.* fig. 63.)

I. Derryclare Lough.—II. Lough Guitane.

6. *S. OVATA*, *Kuetz.* (*W. Sm. l. c.* fig. 70.)

II. Mallow.

7. *S. MINUTA*, *Bréb.* (*W. Sm. l. c.* p. 34, fig. 73.)

II. Mallow.

1. *CYMATOPLEURA ELLIPTICA*, *W. Sm.* (*L. c.* p. 37, tab. 10. fig. 80.)

Burren Hills, Co. Clare.

2. *C. SOLEA*, *W. Sm.* (*L. c.* p. 36, tab. 10. fig. 78.)

I. Near Westport.—II. Mallow.

1. *EPITHEMIA TURGIDA*, *Kuetz.* (*W. Sm. Brit. Diat.* i. tab. 1 ; *Rabh. Fl. Europ. Alg.* p. 62.)

I. Lough Aunierin ; near Westport.—II. Lower Lake of Killarney ; near Lough Brin ; Clogherheen.

2. *E. WESTERMANNI*, *Kuetz.* (*Pritch. Infus.* ed. 1861, p. 760, tab. 4. fig. 2.)

I. Lakes, Clifden to Roundstone ; near Westport.—II. Muckcross.

3. *E. HYNDMANNI*, *W. Sm.* (*Brit. Diat.* i. p. 12, tab. 1. fig. 1.)

II. Clogherheen.

4. *E. SOBEX*, *Kuetz.* (*L. c.* tab. 1. fig. 9.)

I. Lough Aunierin.

5. *E. GIBBA*, *Kuetz.* (*L. c.* tab. 1. fig. 13.)

I. Creggan Lough ; Lough Aunierin ; near Westport ; Lakes E. of Lough Bofin.—II. Muckcross ; near Lough Brin ; Cromaghloun ; Tore Mt. ; Lower Lake of Killarney.

6. *EPITHEMIA VENTRICOSA*, *Kuetz.* (*W. Sm. Brit. Diat.* tab. 1. fig. 14.)

I. Derryclare Lough.

7. *E. ALPESTRIS*, *W. Sm.* (*L. c.* tab. 1. fig. 7.)

II. Cromagloun; Muckcross.

1. *EUNOTIA INCISA*, *Greg.* (*Micr. Journ.* ii. p. 96, tab. 4. fig. 4.)

I. Lakes, Clifden to Roundstone; Oorid Lough; Nacoogarrow Lough.

2. *E. DIODON*, *Ehrenb.* (*Rabh. Fl. Eur. Alg.* i. p. 69.)

I. Lakes near Recess; Kylemore; Oorid Lough; near Oughterard.—II. Lough Guitane.

3. *E. TETRAODON*, *Ehrenb.* (*L. c.* p. 70.)

II. Lough Guitane; Glengarriff; 8 m. S. of Kenmare.

4. *E. DIADEMA*, *Ehrenb.* (*L. c.* p. 70.)

I. Derryclare Lough.—II. Lough Guitane.

5. *E. BIDENTULA*, *W. Sm.* (*L. c.* p. 71.)

I. Lakes, Clifden to Roundstone.

6. *E. ARCUS*, *Ehrenb.* (*W. Sm. Brit. Diat.* ii. tab. 33. fig. 283.)

I. Lough Aunierin; Roundstone; near Westport.

7. *E. MAJUS*, *W. Sm.* (*L. c.* fig. 286.)

II. Carrantuohill; Torc Mt.; Castletown.

Var. *BIDENS*, *W. Sm.* [*Himantidium bidens*, *Greg.* (*Micr. Journ.* ii. tab. 4. fig. 21).]

I. Lakes near Recess.

8. *E. GRACILIS*, *Ehrenb.* (*W. Sm. Brit. Diat.* fig. 285.)

I. Near Westport; Nacoogarrow, Aunierin, Letereen, and Derryclare Loughs; Lakes E. of Lough Bofin; Shindilla and Nabincka Loughs; Roundstone.—II. Lough Guitane; Torc Mt.; Carrantuohill; Castletown; Upper and Lower Lakes of Killarney; 8 m. S. of Kenmare.

9. *E. MONODON*, *Ehrenb.* (*Rabh. Fl. Europ. Alg.* i. p. 73.)

II. Upper Lake of Killarney.

10. *E. PECTINALIS*, *Dillw.* (*Rabh. l. c.* p. 73; *W. Sm. Brit. Diat.* ii. fig. 280.)

I. Roundstone; Creggan, Aunierin, Moher, Letereen, Shindilla, Nabincka, and Derryclare Loughs; Ballynahinch; Lakes E. of

Lough Bofin ; near Westport.—II. Lough Guitane ; near Lough Brin ; Glengarriff ; Lower Lake of Killarney.

11. *EUNOTIA SOLEIBOLII*, *Kuetz.* (*W. Sm. Brit. Diat.* ii. tab. 33. fig. 282.)

I. Near Westport.

1. *CERATONEIS AMPHIOXYS*, *Rabh.* (*Süssw. Diat.* p. 37, tab. 9. fig. 4.)

II. Muckross.

1. *CYMBELLA EHRENBERGII*, *Kuetz.* (*W. Sm. Brit. Diat.* i. p. 17, tab. 2. fig. 21.)

I. Near Westport ; Creggan Lough.

2. *C. CUSPIDATA*, *Kuetz.* (*W. Sm. l. c.* fig. 22.)

I. Near Oughterard ; near Westport ; Moher Lough ; Nabincka and Shindilla Loughs.—II. Glen Caragh ; Glengarriff ; Cloonee Lough.

3. *C. TURGIDA*, *Greg.* (*Micr. Journ.* iv. p. 5, tab. 1. fig. 18.)

I. Roundstone.—II. Carrantuohill ; Adrigole.

4. *C. MACULATA*, *Kuetz.* (*W. Sm. l. c.* fig. 23.)

I. Lakes, Clifden to Roundstone ; Nacoogarrow Lough.—II. Near Lough Brin ; Mallow ; Clogherheen.

1. *COCCONEMA LANCEOLATUM*, *Ehrenb.* (*W. Sm. l. c.* tab. 23. fig. 219.)

II. Muckross ; Torc Mt. ; Mallow ; Clogherheen.

2. *C. CYMBIFORME*, *Ehrenb.* (*W. Sm. l. c.* fig. 220.)

I. Lough Aunierin ; Creggan Lough ; Roundstone ; near Westport.—II. Muckross ; Torc Mt. ; near Lough Brin ; Glengarriff ; Lower Lake of Killarney ; Lough Guitane ; Clogherheen.

3. *C. CISTULA*, *Hempr.* (*Rabh. Fl. Europ. Alg.* i. p. 84.)

I. Aunierin and Derryclare Loughs ; Roundstone ; Creggan Lough.—II. Mallow ; Lower Lake of Killarney ; Torc Mt. ; Clogherheen ; Lough Guitane ; Muckross.

4. *C. PARVUM*, *W. Sm.* (*Brit. Diat.* p. 76, fig. 222.)

I. Near Westport ; Creggan Lough ; Roundstone ; Derryclare Lough.—II. Torc Mt. ; Muckross ; Lough Guitane ; Cloonee Lough ; Mallow.

1. *ENCYONEMA CÆSPITOSUM*, *Kuetz.* (*W. Sm. l. c.* ii. p. 68, tab. 55. fig. 346.)

I. Near Westport.

2. *ENCYONEMA GRACILE*, *Rabh.* (*Fl. Europ. Alg.* i. p. 86.)
 I. Near Westport; Lough Aunierin; Nacoogarrow Lough; Ballynahinch.—II. Muckcross; Glengarriff; Clogherheen; Cloonee Lough; 8 m. S. of Kenmare.
1. *AMPHOEA OVALIS*, *Kuetz.* (*W. Sm. Brit. Diat.* i. tab. 2. fig. 26.)
 I. Near Westport; Moher Lough.—II. Clogherheen; Ross Island.
1. *COCCONEIS PEDICULUS*, *Ehrenb.* (*W. Sm. l. c. i.* tab. 3. fig. 31.)
 II. Lower Lake of Killarney; Mallow.
2. *C. PLACENTULA*, *Ehrenb.* (*W. Sm. l. c. i.* tab. 3. fig. 32.)
 I. Near Westport; Lakes near Recess; Nabincka Lough.—
 II. Mallow; Clogherheen.
3. *C. THWAITESII*, *W. Sm.* (*L. c. i.* tab. 3. fig. 33.)
 I. Moher Lough; Clifden.—II. Muckcross; Torc Mt.; Lough Guitane.
1. *ACHNANTHIDIUM MICROCEPHALUM*, *Kuetz.* (*W. Sm. l. c. ii.* tab. 61. fig. 380.)
 I. Near Westport; Shindilla Lough.—II. Adrigole; 8 m. S. of Kenmare.
2. *A. LANCEOLATUM*, *Bréb.* (*W. Sm. l. c. ii.* tab. 37. fig. 304.)
 I. Near Westport.—II. Rossmacowen; Castletown.
1. *ACHNANTHES EXILIS*, *Kuetz.* (*W. Sm. l. c. ii.* p. 29, tab. 37. fig. 303.)
 I. Derryclare, Nacoogarrow, Shindilla, Boy, Nabincka, Baheh, Shannacloontippen, and Moher Loughs; near Westport; Ballynahinch; Roundstone; Lakes, Clifden to Roundstone.—II. Torc Mt.; Muckcross; Glengarriff; Lough Guitane; Mallow.
2. *A. SUBSESSILIS*, *Kuetz.* (*W. Sm. l. c. p.* 28, tab. 37. fig. 302.)
 II. Rossmacowen.
1. *ODONTIDIUM HYEMALE*, *Kuetz.* (*W. Sm. l. c. p.* 15, tab. 34. fig. 289)
 II. Mallow.
2. *O. MESODON*, *Kuetz.* (*W. Sm. l. c.* tab. 34.)
 I. Roundstone.—II. Torc Mt.; Lower Lake of Killarney; Carrantuohill.

3. ODONTIDIUM MUTABILE, *W. Sm.* (*Brit. Diat.* ii. p. 17, tab. 34. fig. 290.)

I. Near Westport; Nacoogarrow and Shindilla Loughs; Nabincka and Derryclare Loughs.—II. Clogerheen; Lough Guitane; Upper Lake of Killarney; Glengarriff; 8 m. S. of Kenmare.

1. FRAGILARIA CAPUCINA, *Desmaz.* (*W. Sm. l. c.* tab. 35. fig. 296.)

II. Clogerheen; Carrantuohill; Lower Lake of Killarney; Mallow.

1. DIATOMA VULGARE, *Bory.* (*W. Sm. l. c.* p. 39, tab. 40. fig. 309.)
I. Lakes near Recess.

2. D. ELONGATUM, *Ag.* (*W. Sm. l. c.* tab. 40. fig. 311.)

I. Boy Lough; Moher, Creggan, Baheh, and Shindilla Loughs; Roundstone; Ballynahinch.

1. SYNEDRA LUNARIS, *Ehrenb.* (*W. Sm. l. c. i.* p. 69, tab. 11. fig. 82.)

I. Moher, Nacoogarrow, Aunierin, Baheh, Derryclare, and Shindilla Loughs; Ballynahinch; near Westport; Roundstone; Lakes E. of Lough Bofin, and from Clifden to Roundstone.—II. Cloonee Lough; near Lough Brin; Upper and Lower Lakes of Killarney; Torc Mt.; Carrantuohill; Clogerheen; Adrigole; Glengarriff; 8 m. S. of Kenmare.

2. S. BICEPS, *Kuetz.* (*Rabh. Fl. Europ. Alg.* i. p. 130.)

I. Near Westport.—II. Adrigole.

3. S. PULCHELLA, *Kuetz.* (*W. Sm. Brit. Diat.* i. p. 70, tab. 11. fig. 84.)

I. Moher Lough; Shindilla Lough.—II. Muckcross; Glen Caragh; Lower Lake of Killarney; Mallow.

4. S. ULNA, *Ehrenb.* (*Rabh. Fl. Europ. Alg.* i. p. 133.)

II. Torc Mt.; Upper and Lower Lakes of Killarney; near Lough Brin; Lough Guitane; Mallow.

5. S. SPLENDENS, *Kuetz.* (*Rabh. l. c.* p. 134.)

I. Moher, Boy, and Nacoogarrow Loughs; Lakes E. of Lough Bofin; near Oughterard; Baheh Loughs; Derryclare.—II. Lower Lake of Killarney; Clogerheen; Lough Guitane.

6. S. CAPITATA, *Ehrenb.* (*W. Sm. Brit. Diat.* i. p. 72, tab. 12. fig. 93.)

II. Clogerheen; Ross Island.

7. *SYNEDEA ACUS*, *Kuetz.* (*Rabh. Fl. Europ. Alg.* i. p. 136.)
 I. Baheh Loughs.—II. Lough Guitane.
 Var. *APICULATA*, *Rabh.* (*L. c.* p. 136.)
 I. Nabincka and Shindilla Loughs; Nacoogarrow Lough.—
 II. Lough Guitane.
8. *S. DELICATISSIMA*, *Kuetz.* (*W. Sm. Brit. Diat.* i. tab. 12. fig. 94.)
 I. Near Westport; Lough Shindilla; Ballynahinch; Derryclare Lough.—II. Clogerheen.
 1. *ASTERIONELLA FORMOSA*, *Hass.* (*W. Sm. l. c.* ii. p. 81.)
 I. Baheh Loughs; Moher Lough; Kylemore; near Westport.—
 II. Torc Mt.; Lower Lake of Killarney.
1. *AMPHIPLEURA PELLUCIDA*, *Kuetz.* (*W. Sm. l. c.* i. p. 45, fig. 127.)
 I. Derryclare Lough; Ballynahinch; near Westport.—II. Ross Island.
1. *NITZSCHIA AMPHIOXYS*, *W. Sm.* (*Brit. Diat.* i. p. 40, tab. 13. fig. 105.)
 I. Roundstone.—II. Castletown; 8 m. S. of Kenmare; Rossmacowen.
2. *N. VIVAX*, *W. Sm.* (*L. c.* tab. 31. fig. 267.)
 II. Mallow.
3. *N. PARVULA*, *W. Sm.* (*L. c.* tab. 13. fig. 106.)
 I. Near Westport.
4. *N. SIGMOIDEA*, *W. Sm.* (*L. c.* tab. 13. fig. 104.)
 II. Mallow.
5. *N. CURVULA*, *W. Sm.* (*Rabh. Fl. Europ. Alg.* i. p. 156.)
 I. Lakes near Recess, and from Clifden to Roundstone; near Westport; Derryclare Lough.—II. Glengarriff; near Lough Brin; Upper Lake of Killarney; Cloonee Lough.
6. *N. LINEARIS*, *W. Sm.* (*Brit. Diat.* i. p. 39, tab. 13. fig. 110.)
 II. Cloonee Lough.
7. *N. TENUIS*, *W. Sm.* (*L. c.* p. 40, tab. 13. fig. 111.)
 II. Glengarriff; Torc Mt.
8. *N. MINUTISSIMA*, *W. Sm.* (*L. c.* p. 41, tab. 13. fig. 107.)
 I. Derryclare Lough.

1. *NITZSCHIELLA ACICULARIS*, *Rabh.* (*Fl. Europ. Alg.* i. p. 164.)
 - I. Lakes near Recess.
1. *NAVICULA CUSPIDATA*, *Kuetz.* (*W. Sm. Brit. Diat.* i. p. 47, tab. 16. fig. 131.)
 - I. Near Westport.
2. *N. RHOMBOIDES*, *Ehrenb.* (*W. Sm. l. c.* i. p. 46, tab. 16. fig. 129.)
 - I. Lough Aunierin; Ballynahinch; near Westport.—II. Glen Caragh; Upper and Lower Lakes of Killarney; 8 m. S. of Kenmare.
3. *N. SERIANS*, *Kuetz.* (*W. Sm. l. c.* tab. 16. fig. 130.)
 - I. Derryclare Lough; Ballynahinch; near Westport.
4. *N. ELLIPTICA*, *Kuetz.* [*N. ovalis*, *W. Sm. l. c.* p. 48, tab. 17. fig. 153.]
 - II. Torc Mt.
5. *N. GIBBERULA*, *W. Sm.* (*L. c.* p. 51, tab. 17. fig. 160.)
 - I. Creggan Lough.—II. Lough Guitane; Ross Island (forma leviter inflata in medio).
6. *N. INFLATA*, *Kuetz.* (*W. Sm. l. c.* p. 50, tab. 17. fig. 158.)
 - II. Torc Mt.
7. *N. AMPHISBENA*, *Bory.* (*W. Sm. l. c.* tab. 17. fig. 147.)
 - I. Near Westport; Shindilla Lough; Lakes E. of Lough Bofin.
8. *N. SPHÆROPHORA*, *Kuetz.* (*W. Sm. l. c.* tab. 17. fig. 148.)
 - II. Glengarriff; Cloonee Lough.
9. *N. PUSILLA*, *W. Sm.* (*L. c.* fig. 145.)
 - II. Rossmacowen; Castletown.
10. *N. ANGLICA*, *Ralfs*, f. *CRASSA*. [*N. tumida*, *W. Sm. Brit. Diat.* i. tab. 17. fig. 146.]
 - I. Lough Aunierin.
11. *N. RHYNCHOCEPHALA*, *Kuetz.* (*W. Sm. l. c.* p. 47, tab. 16. fig. 132.)
 - I. Boy Lough; Nabincka Lough.
 - Forma *ROBUSTA*, *Rabh.* (*Rabh. Fl. Europ. Alg.* i. p. 196.)
 - I. Near Westport.
 - Forma *PARVA*, *Rabh.* [*N. dirhyncus*, *Ehrenb.*] (*L. c.* p. 196.)
 - I. Near Oughterard.

12. NAVICULA AMPHIRHYNCUS, *Ehrenb.* (*W. Sm. Brit. Diat.* i. tab. 16. fig. 142.)
 I. Ballynahinch; Kylemore; Shindilla and Derryclare Loughs; Lakes E. of Lough Bofin; near Westport.
13. N. PRODUCTA, *W. Sm.* (*L. c.* fig. 144.)
 II. Glengarriff.
14. N. EXILIS, *Grun.* (*Rabh. Fl. Europ. Alg.* i. p. 198.)
 I. Derryclare Lough; Lakes, Clifden to Roundstone; Nacoo-garrow Lough; Roundstone.—II. Cloonee Lough.
15. N. ANGUSTATA, *W. Sm.* (*Brit. Diat.* p. 52, tab. 17. fig. 156.)
 I. Derryclare Lough; Lakes near Recess.—II. Tore Mt.; Castletown.
16. N. CRYPTOCEPHALA, *Kuetz.* (*W. Sm. l. c.* fig. 155.)
 I. Near Westport; Moher and Nabincka Loughs; Roundstone.—II. Glengarriff; Clogherheen; Mallow.
 Var. LANCEOLATA, *Grun.* (*Rabh. Fl. Europ. Alg.* i. p. 198.)
 II. Lower Lake of Killarney.
17. N. DICEPHALA, *Ehrenb.* (*W. Sm. Brit. Diat.* i. p. 53, tab. 17. fig. 157.)
 I. Creggan, Shindilla, and Moher Loughs.—II. Adrigole; Cloonee Lough; Carrantuohill.
18. N. UNDOSA, *Ehrenb.* (*Rabenh. Süsw. Diat.* tab. 6. fig. 56.)
 I. Lakes, Clifden to Roundstone; Lough Aunierin.
1. PINNULARIA NOBILIS, *Ehrenb.* (*W. Sm. Brit. Diat.* i. p. 54, tab. 17. fig. 161.)
 I. Near Oughterard; Ballynahinch.—II. Lough Guitane; near Lough Brin; Muckross; Carrantuohill.
2. P. MAJOR, *Rabh.* (*W. Sm. l. c.* tab. 18. fig. 162.)
 I. Near Oughterard; near Westport; Shindilla and Creggan Loughs.—II. Cromagloun; Clogherheen; Upper Lake of Killarney.
3. P. RABENHORSTII, *Ralfs.* (*Rabh. Fl. Europ. Alg.* i. p. 211.)
 I. Near Westport; Ballynahinch; Loughs Shindilla and Aunierin; Lakes near Recess.—II. Lough Guitane; Adrigole; Lower Lake of Killarney; Glengarriff; Cloonee Lough.

4. *PINNULARIA TABELLABIA*, *Ehrenb.* (*W. Sm. Brit. Diat.* i. tab. 19. fig. 181.)

I. Near Westport; Lakes near Recess.—II. Glengarriff; Upper Lake of Killarney.

Var. *ACROSPHERIA*, *Rabh.* (*W. Sm. l. c.* tab. 19. fig. 183.)

I. Lakes near Recess; Ballynahinch; near Westport.—II. Cromagloun; Muckcross; Castletown; Clogherheen.

5. *P. GIBBA*, *Ehrenb.* (*W. Sm. l. c.* fig. 180.)

I. Near Westport; Aunierin and Moher Loughs; Lakes E. of Lough Bofin and near Recess.—II. Lough Guitane; Muckross; Cromagloun; Lower Lake of Killarney; near Lough Brin; Glengarriff.

6. *P. VIRIDIS*, *W. Sm.* (*L. c.* tab. 18. fig. 163.)

I. Near Westport; Roundstone; Shannacloontippen, Shindilla, Oorid, and Creggan Loughs; Lakes E. of Lough Bofin.—II. Tore Mt.; Cromagloun; Glengarriff; Carrantuohill; Mallow; Lower Lake of Killarney; Clogherheen.

7. *P. HEMIPTERA*, *Rabh.* (*Fl. Europ. Alg.* i. p. 212.)

I. Derryclare Lough.

8. *P. PEREGRINA*, *Ehrenb.* (*W. Sm. Brit. Diat.* i. tab. 18. fig. 170.)

I. Derryclare Lough; Lakes, Clifden to Roundstone; near Westport; Moher Lough.—II. Muckcross.

9. *P. ALPINA*, *W. Sm.* (*L. c.* p. 55, tab. 18. fig. 168.)

I. Derryclare Lough.—II. Carrantuohill.

10. *P. RADIOSA*, *Rabh.* (*W. Sm. l. c.* p. 56, tab. 18. fig. 173.)

I. Shannacloontippen, Aunierin, Derryclare, and Moher Loughs; Roundstone; near Westport.—II. Mallow.

Var. *ANGUSTA*, *Rabh.* (*Fl. Europ. Alg.* i. p. 215.)

I. Near Oughterard; Clifden; Derryclare Lough; Nacoo-garrow Lough.—II. Adrigole.

11. *P. ACUMINATA*, *W. Sm.* (*Brit. Diat.* i. p. 55, tab. 18. fig. 164.)

I. Near Westport.

12. *P. ACUTA*, *W. Sm.* (*L. c.* fig. 171.)

I. Near Westport; Boy Lough; Creggan Lough.

13. *PINNULARIA MESOLEPTA*, *W. Sm.* (*Brit. Diat.* i. p. 58, tab. 19. fig. 182.)

I. Ballynahinch; near Westport; Kylemore; Lough Aunierin; Lakes near Recess.

14. *P. DIVERGENS*, *W. Sm.* (*L. c.* p. 57, tab. 19. fig. 178.)

I. Derryclare Lough.—II. Lough Guitane; Carrantuohill.

15. *P. BREBISSONII*, *Rabh.* (*Fl. Europ. Alg.* i. p. 222.)

I. Derryclare Lough; near Westport.—II. Cloonee Lough.

1. *FRUSTULIA SAXONICA*, *Rabh.*, forma *AQUATICA*, *Rabh.* (*Fl. Europ. Alg.* i. p. 227.)

I. Near Westport; Athry Lake; Ballynahinch; Clifden; Nacoogarrow and Derryclare Loughs; Lough Aunierin.—II. Lough Guitane; Torc Mt.; Glengarriff; Upper and Lower Lakes of Killarney; Carrantuohill; Cloonee Lough; 8 m. S. of Kenmare.

1. *PLEUROSIGMA LACUSTRE*, *W. Sm.* (*Brit. Diat.* i. p. 66, tab. 21. fig. 217.)

I. Near Westport.

1. *STAURONEIS PHENICENTERON*, *Ehrenb.* (*W. Sm. l. c.* p. 59, tab. 19. fig. 185.)

I. Near Westport; near Leenane; Kylemore; Ballynahinch; near Oughterard; Moher Lough; Shindilla and Bahch Loughs; Lakes E. of Lough Bofin.—II. Sugar Loaf Mt.; near Lough Brin; Glengarriff; Clogherheen; Cloonee Lough.

2. *S. GRACILIS*, *Ehrenb.*, forma, *Rabh.* [*S. gracilis*, *W. Sm.*] (*L. c.* p. 59, tab. 19. fig. 186.)

I. Near Westport; Moher Lough.

3. *S. ANCEPS*, *Ehrenb.* (*W. Sm. l. c.* fig. 190.)

I. Lakes E. of Lough Bofin; Loughs Aunierin and Shindilla.—II. Glengarriff; Cloonee Lough.

Forma *LINEARIS*, *Rabh.* (*Fl. Europ. Alg.* i. p. 247.)

I. Near Oughterard.

1. *PLEUROSTAUROUM LEGUMEN*, *Rabh.* [*Stauroneis linearis*, *W. Sm.* (*Brit. Diat.* i. p. 60, tab. 19. fig. 193).]

I. Near Westport.

1. *MASTOGLOIA SMITHII*, *Thw.* (*Brit. Diat.* i. tab. 54. fig. 341.)
II. Cloonee Lough.
1. *GOMPHONEMA TENELLUM*, *Kuetz.* (*W. Sm. l. c.* i. p. 80, tab. 29. fig. 243.)
I. Nabincka Lough; Baheh and Nacoo-garrow Loughs; Derryclare Lough.—II. Carrantuohill.
2. *G. DICHOTOMUM*, *Kuetz.* (*W. Sm. l. c.* fig. 240.)
I. Lakes, Clifden to Roundstone; Derryclare, Shindilla, Moher, and Nabincka Loughs; Lakes E. of Lough Bofin; Roundstone; near Recess.—II. Torc Mt.; Castletown; Muckcross; Carrantuohill; Clogerheen; Cloonee Lough.
Forma distincte constricta infra apices.
I. Lakes, Clifden to Roundstone.
3. *G. VIBRIO*, *Ehrenb.* (*W. Sm. l. c.* p. 81, tab. 28. fig. 242.)
I. Kylemore.
Var. *HEBRIDENSE*, *Rebh.* (*Fl. Europ. Alg.* p. 287.)
I. Lough Anierin.
4. *G. CAPITATUM*, *Ehrenb.* (*W. Sm. Brit. Diat.* i. p. 80, tab. 28. fig. 237.)
II. Lower Lake of Killarney.
5. *G. CONSTRICTUM*, *Ehrenb.* (*W. Sm. l. c.* p. 78, tab. 28. fig. 236.)
I. Moher Lough.—II. Torc Mt.; Clogerheen; Lower Lake of Killarney; Mallow.
6. *G. GEMINATUM*, *Ag.* (*W. Sm. l. c.* p. 78, tab. 27. fig. 235.)
II. Muckcross; Mallow; Lower Lake of Killarney.
7. *G. ACUMINATUM*, *Ehrenb.* (*W. Sm. l. c.* fig. 238.)
I. Near Westport; Baheh, Moher, Shannaclontippen, Nacoo-garrow, Shindilla, and Derryclare Loughs; Lakes, Clifden to Roundstone, and near Recess; Roundstone; Lakes E. of Lough Bofin.—II. Lough Guitane; Torc Mt.; near Lough Brin; Mallow; Clogerheen; 8 m. S. of Kenmare.
8. *G. OLIVACEUM*, *Kuetz.* (*W. Sm. l. c.* p. 80, tab. 29. fig. 244.)
I. Roundstone; Nabincka Lough; Baheh Loughs.—II. Carrantuohill.

9. *GOMPHONEMA INTRICATUM*, *Kuetz.* (*W. Sm. Brit. Diat.* i. tab. 29. fig. 241.)

I. Near Westport; Baheh Loughs; Roundstone; Ballynahinch.—II. Tore Mt.; Muckcross; Lough Guitane; near Lough Brin.

1. *MERIDION CIRCULARE*, *Ag.* (*W. Sm. l. c.* p. 6, tab. 32. fig. 277.)

II. Lower Lake of Killarney.

2. *M. CONSTRICTUM*, *Ralfs.* (*W. Sm. l. c.* tab. 32. fig. 278.)

II. Carrantuohill.

1. *TABELLARIA FLOCCULOSA*, *Kuetz.* (*W. Sm. l. c.* p. 45, tab. 43. fig. 316.)

I. Glendalough; near Westport; Moher, Nacoogarrow, Nabincka, Derryclare, Shindilla, Creggan, and Baheh Loughs; near Leenane; Roundstone.—II. Lough Guitane; Upper and Lower Lakes of Killarney; Tore Mt.; Carrantuohill; Glen Caragh; Castletown; Cloonee Lough; 8 m. S. of Kenmare.

2. *T. FENESTRATA*, *Kuetz.* (*W. Sm. l. c.* fig. 317.)

I. Near Westport; near Oughterard; Glendalough; Lakes near Recess, and from Clifden to Roundstone; Athry, Nabincka, Moher, Baheh, and Derryclare Loughs; Ballynahinch; Lough Shindilla; Nacoogarrow and Arderry Loughs; Roundstone.—II. Lough Guitane; Tore Mt.; Sugar Loaf Mt.; Muckcross; Lower Lake of Killarney; Cloonee Lough; Glengariff; Adrigole.

EXPLANATION OF THE PLATES.

<i>a, a', a''</i>	=	cellula vel semicellula a fronte visa.
<i>b, b'</i>	=	„ „ vertice „
<i>c</i>	=	„ „ latere „
<i>d</i>	=	„ „ basi „
<i>e, e'</i>	=	zygospora (cum vel sine semicellulis residuis).

PLATE XVIII.

Fig. 1. *Edogonium platygnum*, Wittr., forma *major*, West. 400/1.

2. „ *suecicum*, Wittr. 400/1.

3. „ *pilosporum*, West. 625/1.

4-5. *Zygnema leiospermum*, De Bary, forma *megasporea*, West. 400/1.

PLATE XVIII. (continued).

- Fig. 6. *Botryococcus calcareus*, West. 400/1.
 7. *Scenedesmus denticulatus*, Lagerh., var. *lineatus*, West. a, 400/1; a' et a'', 625/1.
 8. *Anabæna* (*Sphærozyga*) *orthogona*, West. 400/1.
 9. *Aphanocapsa Grevillei*, Rabh., var. *microgranula*, West. 600/1.
 10-12. *Ædogonium londinense*, Wittr., var. *compressum*, West. 400/1.
 13. *Chlorococcum gigas*, Grun., var. *maximum*, West. 400/1.
 14. *Acanthococcus* sp. 400/1.
 15. *Polyedrium tetraædricum*, Naeg. 400/1.
 16. *Closterium moniliferum*, Ehrnb. (c. *Chytridio*).
 17. *Mougeotia elegantula*, Wittr., forma *microspora*, West. 400/1.

PLATE XIX.

- Fig. 1. *Sphærozozma Aubertianum*, West. 400/1.
 2. *Spondylosium tetragonum*, West. 400/1.
 3. " *pulchrum*, Arch., var. *triquetrum*, Lund. 400/1.
 4. Forsan semicellulæ juveniles duæ *Cosmarii abnormalis* in stato divisionis. 625/1.
 5. *Docidium dilatatum* (Cleve), Lund. 400/1.
 6. " " " " forma. 400/1.
 7. " " " " var. *subundulatum*, West. 400/1.
 8-10. *Pleurotenium coronatum*, Rabh. 400/1.
 11. " " " " var. *fluctuatum*, West. 400/1.
 12. " " " " var. *robustum*, West. 400/1.
 13. *Closterium Pritchardianum*, Arch., var. *minus*, West. 400/1.
 14. " *toxon*, West. a, 600/1; a' et a'', 400/1.
 15. " *gracile*, Bréb., forma *gracillima*, West. 400/1.
 16. " *subtile*, Bréb., forma. 600/1.
 17. *Penium exiguum*, West. a et a'', 600/1; a', 400/1.
 18. " " " a, 600/1; a', a'', et ð, 400/1.
 19. " *adelochondrum*, Elfv. 400/1.

PLATE XX.

- Fig. 1. *Penium minutum*, Cleve, var. *crassum*, West. 400/1.
 2. " " " " " forma *punctata*, West. 400/1.
 3. " " " " " forma *inflata*, West. 400/1.
 4. " " " " var. *undulatum*, West. 400/1.
 5. *Cylindrocystis diplospora*, Lund, **major*, West. 400/1.
 6. *Mesotænium De-Greyii*, Turn., var. *breve*, West. 400/1.
 7. *Tetmemorus granulatus*, Ralfs, var. *attenuatus*, West. 400/1.
 8. *Spirotænia bispiralis*, West. 400/1.
 9. *Micrasterias pinnatifida*, Ralfs, forma. 400/1.
 10. " *papillifera*, Bréb., var. *glabra*, Nord., forma *inflata*, West. 400/1.

PLATE XX. (continued).

- Fig. 11. *Euastrum verrucosum*, Ehrnb., var. *coarctatum*, Delp., forma. 400/1.
 12. „ *elegans*, Kuetz., forma. 625/1.
 13. „ *pyramidatum*, West. 400/1.
 14. „ *binale*, Ralfs, forma *hians*, West. 600/1.
 15. „ „ „ **subelobatum*, West. 400/1.
 16. „ *crassangulatum*, Boerg., var. *ornatum*, West. 400/1.
 17. „ *denticulatum*, Gay, var. *granulatum*, West. 600/1.
 18. „ *Turnerii*, West. 400/1.
 19. *Cosmarium tatricum*, Racib., var. *sphæruliferum*, West. 400/1.
 20. „ *eductum*, Roy et Biss., var. *angustatum*, West. 625/1.
 21. „ *pseudopyramidatum*, Lund, forma *subrectangularis*, West. 400/1.
 22-23. „ *succisum*, West. 400/1.
 24. „ *pygmæum*, Arch. 400/1.
 25. „ *tenuë*, Arch. 400/1.

PLATE XXI.

- Fig. 1. *Cosmarium venustum*, Rabh., var. *hypoheaxagonum*, West. 400/1.
 2. „ *perpusillum*, West. 600/1.
 3. „ *Regnesii*, Reinsch, var. *tritum*, 600/1.
 4. „ *Subdanicum*, West. a, 600/1 ; b et c, 400/1.
 5. „ *Nuttallii*, West. 600/1.
 6. „ *Brebissonii*, Menegh., forma *erosa*, West. 400/1.
 7. „ *conspersum*, Ralfs, var. *subrotundatum*, West. a, 600/1 ; a' et b, 400/1.
 8. „ *sphæroideum*, West. a, b, et c, 400/1 ; a', 600/1.
 9. „ *subpunctulatum*, Nord., var. *Boergesenii*, West. 625/1.
 10. „ *Arnellii*, Boldt, forma *compressa*, West. 625/1.
 11. „ *synthlibomenum*, West. 625/1.
 12. „ *Botrytis* (Bory), Menegh., var. *mediolæve*, West. a, b, et c, 400/1 ; a', 600/1.
 13. „ *confusum*, Cooke, **ambiguum*, West. a, b, et c, 600/1 ; a', 400/1.
 14. „ *Boeckii*, Wille, **bipapillatum*, West. 400/1.
 15. „ *isthmium*, West, forma *hibernicum*, West. 400/1.
 16. „ *connatum*, Bréb., var. *truncatum*, West. 400/1.
 17. „ *pseudocconnatum*, Nord., var. *constrictum*, West. 400/1.
 18. „ *obcuneatum*, West. a, 600/1 ; e, 400/1.
 19. „ *Hibernicum*, West. 400/1.

PLATE XXII.

- Fig. 1. *Xanthidium armatum*, Bréb., var. *irregularius*, West. 400/1.
 2. „ *antilopæum*, Kuetz., forma. 400/1.
 3. „ *cristatum*, Bréb., forma *angulatum*, West. 400/1.
 4. „ *subhastiferum*, West. 400/1.
 5. „ *Smithii*, Arch., var. *collum*, West. 400/1.
 6. „ *concinnum*, Arch., var. *Boldtiana*, West. 400/1.

PLATE XXII. (continued).

- Fig. 7. *Arthrodesmus elegans*, West. 400/1.
 8. „ *bifidus*, Bréb., var. *latodivergens*, West. 400/1.
 9. „ *tenuissimus*, Arch. 400/1.
 10. „ *glaucescens*, Wittr., forma *convexa*, West. 400/1.
 11. *Staurastrum dejectum*, Bréb., var. *inflatum*, West. 400/1.
 12. „ *corniculatum*, Lund, var. *spinigerum*, West. 400/1.
 13. „ *curvatum*, West. 400/1.
 14. „ *jaculiferum*, West. 400/1.
 15. „ *O'Mearii*, Arch., var. *minutum*, West. 400/1.
 16. „ *cristatum*, Arch., forma. 625/1.
 17. „ *oligacanthum*, Bréb., var. *incisum*, West. 400/1.
 18. „ *polytrichum*, Perty, forma. 600/1.

PLATE XXIII.

- Fig. 1. *Staurastrum megalonotum*, Nord., forma Nord. 400/1.
 2. „ *avicula*, Bréb., var. *verrucosum*, West. 400/1.
 3. „ *spongiosum*, Bréb., var. *perbifidum*, West. 400/1.
 4. „ *subscabrum*, Nord., forma *scabrior*, West. 400/1.
 5. „ *trachygonum*, West. 400/1.
 6. „ *hibernicum*, West. 400/1.
 7. „ *pygmæum*, var. *trilineatum*, West. 400/1.
 8. „ *subpygmæum*, West. 400/1.
 9. „ *amœnum*, Hilse, var. *brasiliense*, Boerg. 400/1.
 10. „ *arcuatum*, Nord., var. *guitanense*, West. 400/1.
 11. „ *gracile*, Ralfs, **bulbosum*, West. 400/1.
 12. „ *paradoxum*, Meyen, forma *parva*, West. 400/1.
 13. „ „ „ var. *nodulosum*, West. 400/1.
 14. „ *nator*, West. 400/1.
 15. „ *Archerii*, West. 400/1.

PLATE XXIV.

- Fig. 1. *Staurastrum Pseudosibaldi*, Wille, **duacense*, West. 400/1.
 2. „ *anatinum*, Cooke et Wills., var. *truncatum*, West. 400/1.
 3. „ „ „ „ **biradiatum*, West. 400/1.
 4. „ *arachnoides*, West. 400/1.
 5. „ *teliferum*, Ralfs (cum zygosp.). 400/1.
 6. „ „ „ „ forma *obtusa*, West. 400/1.
 7. *Euastrum pectinatum*, Bréb. (cum zygosp.). 400/1.
 8. *Mesotanium chlamydosporum*, De Bary (cum zygosp.). 400/1.
 9. *Cosmarium plicatum*, Reinsch, var. *hibernicum*, West. 400/1.
 10. „ *elegantissimum*, Lund., forma *minor*, West. 400/1.
 11. *Arthrodesmus Incus*, Hass. (cum zygosp.). 400/1.
 12. *Pleurotanium tridentulum*, nob., var. *capitatum*, West. 625/1.
 13. *Euastrum scitum*, West. a-c, 400/1; a', 625/1.
 14. *Staurastrum minutissimum*, Reinsch, var. *constrictum*, West. 625/1.
 15. *Cosmarium obliquum*, Nord., var. *trigonum*, West. 400/1.

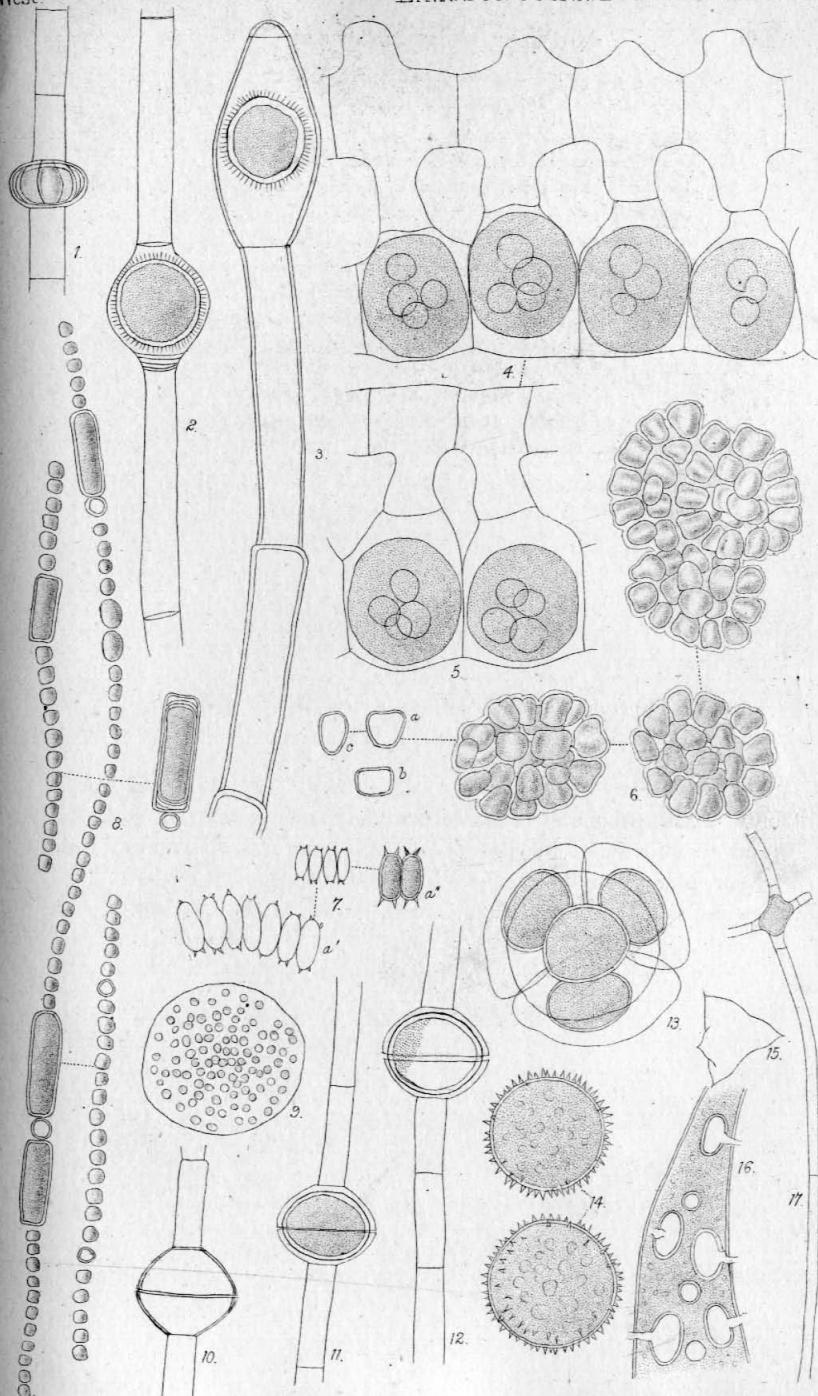
PLATE XXIV. (*continued*).

- Fig. 16. *Staurastrum trachynotum*, West., var. *annulatum*, West. 400/1.
 17. *Xanthidium apiculiferum*, West. 625/1.
 18. *Cosmarium Meneghinii*, Bréb., var. *Wollei*, Lagerh. (forma monstrosa).
 400/1.
 19. *Arthrodesmus triangularis*, Lagerh., forma. 400/1.
 20. *Penium suboctangulare*, West. 400/1.
 21. *Cosmarium subprotumidum*, Nord., forma. 625/1.
 22. „ *obsoletum*, Reinsch, var. *angustatum*, West. 400/1.
 23. „ *venustum*, Arch., var. *hypohexagorum*, West, f. *incrassata*,
 West. 400/1.
 24. „ *arctoum*, Nord., f. *minor*, West. 400/1.
 25. „ *cucurbita*, Bréb., f. *major*, West. 400/1.
 26. *Zygonium momoniense*, West. 400/1.

Supplementary Note on a new Fossil Plant,
 by THOMAS HICK, B.A., B.Sc. (*ante*, p. 86).

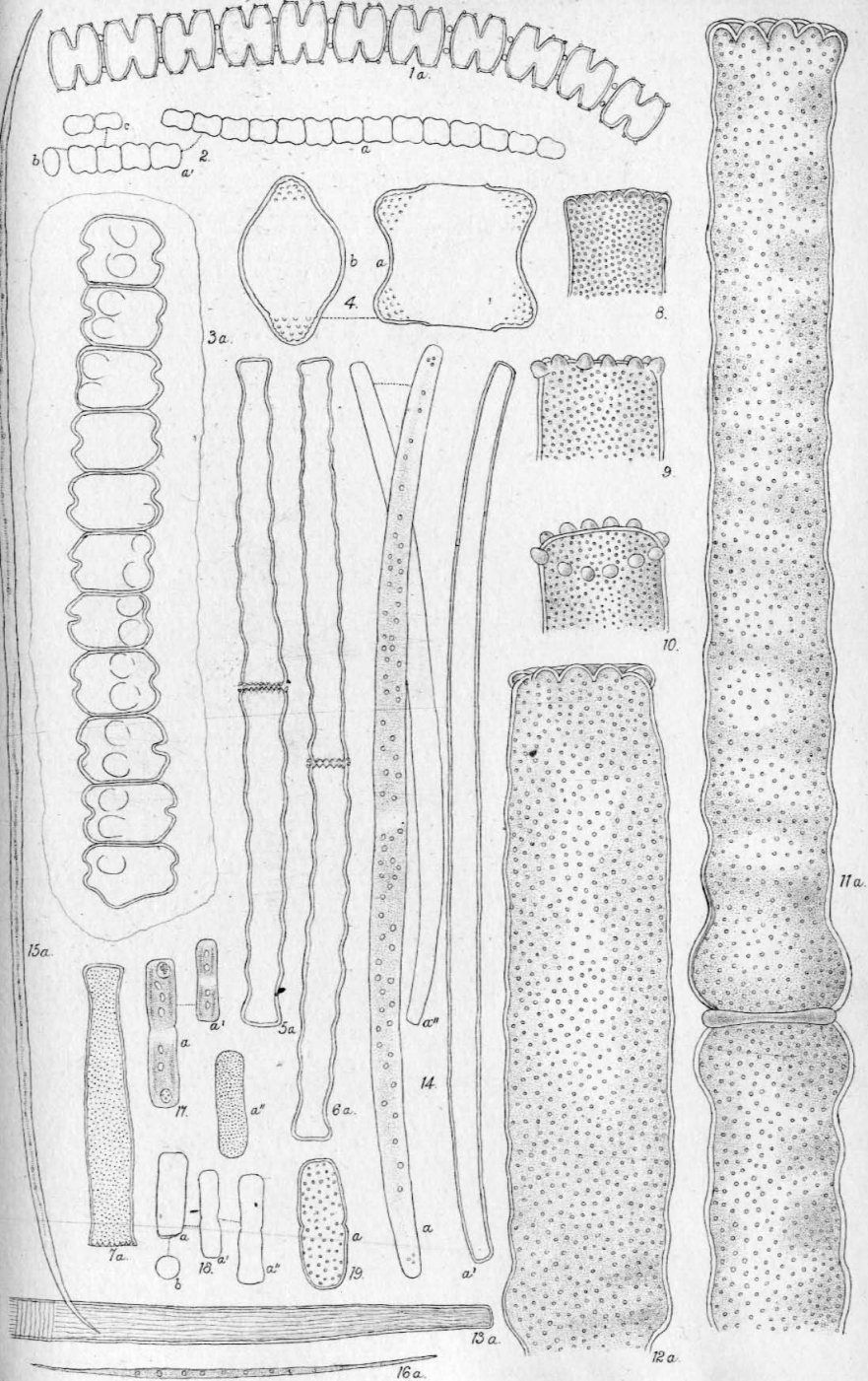
To avoid any possible confusion with *Tylophora*, R. Br., Mr. Hick proposes to withdraw the name given on p. 101, and to substitute for it *Xenophyton*, from ξένος, strange, and φυτόν, plant, to indicate the curious structure of the plant; the species will therefore be henceforth known as *X. radiculosa*.

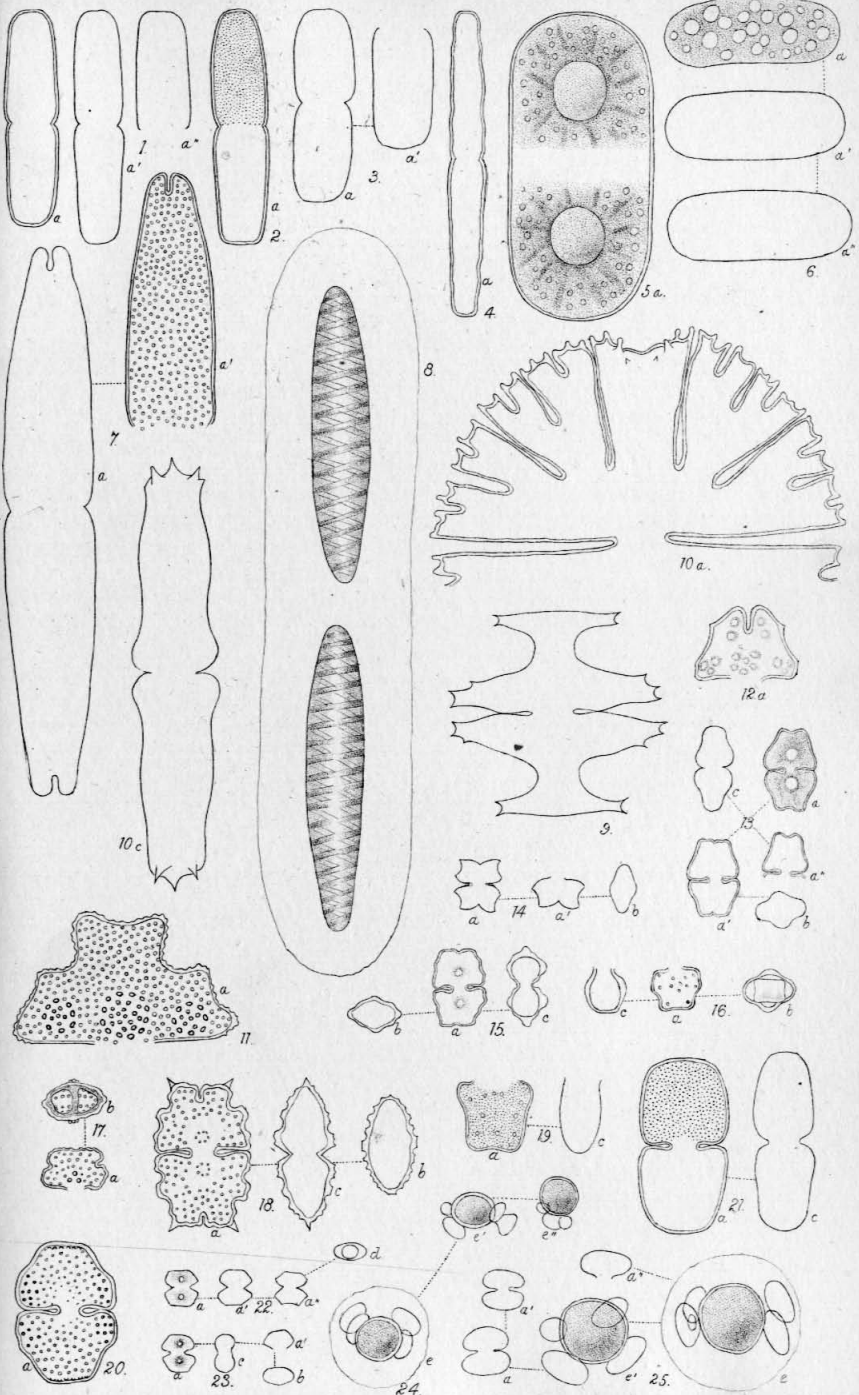
West.



G.S. West ad nat. del. J. Carter sc.

Mintern Bros imp.





G.S. West ad nat. del. J. Carter sc.

Mintern Bros imp.

