

A SECOND LIST OF ALGAE FOUND IN WISCONSIN LAKES

GILBERT MORGAN SMITH

Notes from the laboratory of the Wisconsin Geological and Natural History Survey XIV.

The following list of algae is a continuation of the study of Wisconsin algae under the auspices of the Wisconsin Geological and Natural History Survey. The collections of the past season (1916) are from two lake areas that were not visited before; the Southeastern part of the state in Walworth, Kenosha and Racine counties, and the Northwestern in Sawyer, Washburn, Barron, Rusk and Polk counties. The scope of the work has been curtailed since the publication of the first list and attention has been confined to the phytoplankton.

Following the system used in the preliminary list, the exact location of each new lake is given in the following table.

In citing the geographical distribution of the lakes they are placed in three groups as follows: I, those mentioned in the preliminary list; II, the Southeastern lake area; III, the Northwestern lake area. In order to show the relative abundance of each individual species the following symbols are used; (aaa) very abundant, (aa) abundant, (a) fairly abundant, (ccc) very common, (cc) common, (e) fairly common, (s) fairly scarce, (ss) scarce, (sss) very scarce, (r) fairly rare, (rr) rare, (rrr) very rare.

Lake	County	Town	Range	Section
Amicoy	Rusk	34N	8W	25
Bear	Barron, Washburn.	36N	12W	1, 2, 3
Beaver	Waukesha.	8N	18E	.....
Beaverdam	Barron	36N	13 & 14W	.....
Birch	Washburn	37N	10W	24
Brown's	Racine	1 & 2N	19E	.....
Camp	Kenosha	1N	20E	.....
Center	Kenosha	1N	20E	.....
Chetek	Sawyer	37, 38N	9W	8, 17, 4, 34, 38
Chetek	Barron	33N	10W	29
Delavan	Walworth	2N	16E	.....
Devils	Barron	36N	11W	5, 6, 7, 8
Duck	Barron	36N	13W	32, 33
Dummy	Barron	36N	13W	28
Eagle	Racine	3N	20E	.....
Elizabeth	Kenosha	1N	19E	.....
Granite	Barron	36N	13W	20, 29
Green	Walworth	4N	16E	.....
Grindstone	Sawyer	40N	8, 9W	.....
Hooker	Kenosha	1N	20E	.....
Horseshoe	Polk	34N	15W	1, 12, 13
Island	Rusk	33N	8W	28, 29
Lac Court Oreilles	Sawyer	39, 40N	8, 9W	.....
Lauderdale (see Mill Lakes)	1, Middle and Green Lakes)			
Little Rice	Rusk	33N	8W	23, 26
Mary	Kenosha	1N	19E	.....
Middle	Walworth	4N	16E	.....
Mill	Walworth	4N	16E	.....
Owen	Bayfield	44N	7W	.....
Number One	Sawyer	37N	9W	.....
Paddock	Kenosha	1N	20E	.....
Pine	Waukesha	8N	18E	.....
Pokegama	Barron	33N	10W	17, 20
Prairie	Barron	33, 34N	11W	2, 12, 13, 19
Reserve	Sawyer	39N	8W	5, 8
Rice	Barron	35N	11W	16, 21
Shell	Washburn	37, 38N	12, 13W	.....
Silver	Barron	36N	13W	14, 25
Silver	Kenosha	1N	20E	.....
Twin Lakes (See Ma ry and Elizabeth)	ry and Elizabeth)			
Vermilion	Barron	35N	13W	14, 15
Whitefish	Sawyer	39N	9W	12, 14

Class PHAEOPHYCEAE

Order Chromulinales

Family EUCHROMULINACEAE

Genus CHRYSAMOEBA Klebs 1893.

CHRYSAMOEBA RADIANS Klebs.

Zeits. f. wiss. Zool. 55: 407, *pl.* 18, *figs.* 1a-1c. 1893.

I. Taylor (rr).

Family MALLOMONADACEAE

Genus MALLOMONAS Perty 1852

MALLOMONAS TONSURATA Teiling

Sv. Bot. Tids 6: 277. *fig.* 3. 1912

I. Waupaca (rr).

MALLOMONAS PRODUCTA (Zach.) Iwanoff.

Bull. de l'Acad. d. Sc. d. St. Pétersbourg, 5 Ser. 11: 250. *figs.* A⁴ A⁶. 1899.

I. Catfish (sss), Cranberry (ss).

var. MARCHICA Lemmermann.

Zeits. f. Fischeri. 106 1903.

I. Oconomowoc (ss), Tamarack (sss).

MALLOMONAS CAUDATA Iwanoff.

Bull. de l'Acad. d. Sc. d. St. Pétersbourg, 5 Ser. 11: 250. *figs.* B¹-B⁸. 1899.

I. Birch (rrr), Hill (ss), No Mans (ss), Rock (cc), North Turtle (r).

Genus CHRYSOSPHAERELLA Lauterborn 1896.

CHRYSOSPHAERELLA LONGISPINA Lauterborn.

Zeits. f. wiss. Zool. 65: 381. *pl.* 18, *figs.* 12-16. 1899; Zool. Anz. 19: 16
1896.

I. Lac la Belle (ccc), Oconomowoc (ss), Okauchee (r), Waupaca (sss).

II. Elizabeth (rr), Mary (ss), Silver (ss).

Order Isochrysidales

Family EUHYMENOMONADACEAE

Genus SYNURA Ehrenberg 1838.

SYNURA UVELLA Ehrenberg.

Die Infusionsthierchen. 60. *pl.* 3, *fig.* 9. 1838.

- I. Mendota (ss), Oconomowoc (ss), North Turtle (rr), Waupaca (r).
- II. Camp (ss), Mill (cc).

Order Ochromonadales

Family EUCHROMONADACEAE

Genus UROGLENOPSIS Lemmermann 1899.

UROGLENOPSIS AMERICANA (Calkins) Lemm.

Forschungsbr. a. d. Biol. Stat. zu Plön 7: 107. 1899; Kryptogamenfl. d. M. Brauendorf 3: Algen 1: 449. 444 *figs.* 1-6. 1908

- I. Mendota (ss), Oconomowoc (rr), Okauchee (sss).
- II. Browns (ss), Camp (ss), Eagle (sss), Mill (ss), Paddock (s).

Genus DINOBYRON Ehrenberg 1833

DINOBYRON CALICIFORMIS Bachmann.

Arch. f. Hydrobiol u. Planktonkde 3: 82. *fig.* XI¹². 1908.

- II. Browns (sss) (On *Microcystis*)

DINOBYRON SETULARIA Ehrenberg.

Die Infusionsthierchen. 124. *pl.* 8, *fig.* 8. 1838.

- I. Devils (ccc), Lost (ss), Lower Nehmabin (r), Rock (cc).

DINOBYRON SOCIALE Ehrenberg.

Die Infusionsthierchen. 125. *pl.* 8, *fig.* 9. 1838.

- I. Green (sss), Oconomowoc (cc), North Turtle (rr), Waupaca (cc), Trout (rr)
- II. Green (ss), Mill (ccc), Silver (s).

DINOBYRON STIPITATUM Stein.

D. Org. d. Inf. 3: 1. *pl.* 12, *f.* 5. Lemmerman. Flagellata 2, in Pascher,

D. Süßwasserfl. Deut., Österr. u. d. Schw. 2: 73. *f.* 118. 1913.

- I. Oconomowoc (ss), Waupaca (ss).

DINOBYRON BAVARICUM Imhof.

Zool. Anz. 13. 484 1890; Lemmermann, Bot. Not. 1903; 78. *pl.* 3, *figs.* 3-4.

- I. George (sss), Harris (rr), Oconomowoc (rr), Speese (ss), Waupaca (ss).

DINOBYRON DIVERGENS (Imhof) Lemmermann.

Ber. d. D. Bot. Ges. 18: 517. *pl.* 19, *figs.* 15-20. 1900.

- I. George (r), Green (rr), Hill (cc), Lac la Belle (ss), Meta (r), Oconomowoc (cc), Rock (ss), Speese (cc), Tamarack (ss), Turtle, North (ss), Waupaca (s).
II. Browns (cc), Center (ss), Elizabeth (cc), Mary (c), Mill (cc), Silver (cc).

Family PHAEOCAPSACEAE.

Genus PHAEOCOCCUS Borzi 1892.

PHAEOCOCCUS PLANCTONICUS W. & G. S. West.

Trans. Roy Soc. Edinb. 41: 496. *pl.* 6, *figs.* 15-16. 1905.

The margins of the chromoplasts of the Wisconsin form are entire and not irregularly lobed as the Wests describe them.

- I. Devils (cc), Mendota (sss).
II. Mary (s), Silver (s).
III. Shell (sss).

Class MYXOPHYCEAE.

Order Chroococcales.

Family CHROOCOCCACEAE.

Genus CHROOCOCCUS Nägeli 1849.

CHROOCOCCUS DISPERSUS (v. Keissler) Lemmermann.

Arkiv. f. Botanik 2: No. 2: 102. 1904.

C. minor var. *dispersus* v. Keissler, Verh. d. zool.-bot. Ges. in Wien 52: 311. *fig.* 6. 1902.

- II. Browns (rr).

CHROOCOCCUS LIMNETICUS Lemmermann.

Bot. Cent. 76: 153. 1898: Forschungsbr. a. d. Biol. Stat. zu Plön 7: 132. *pl.* 1, *figs.* 22-23. 1899:

- I. Beaver (Oconomowoc) (rr), Upper Nashotah (rr).

- II. Browns (sss), Camp (rr), Eagle (rr), Mary (rr), Mill (rr), Silver (r).
 III. Birch (ss), Chetac (r), Chetek (rrr), Grindstone (rr), Horseshoe (r),
 Island (rr), Lac Court Oreilles (rr), Pokegema (rr), Reserve (sss).

var. *DISTANS* G. M. Smith.

- Bull. Torr. Bot. Cl. 43: 481. *pl.* 26, *f.* 26. 1916.
 II. Browns (sss).

var. *SUBSALSUS* Lemmermann.

- Forschungsbr. a. d. Biol. Stat. zu Plön 8: 84. 1901; Arkiv f. Botanik 2: No.
 2. 101. *pl.*, 1, *f.* 9. 1904.
 III. Lac Court Oreilles (ss), Owen (ss).

var. *elegans* var. nov

Colonies of 8–64 cells in a copious, hyaline gelatinous envelop.
 Cell contents olive green, without pseudovacuoles.

Diam. cells (with individual sheath) 20–26, μ ; (without sheath) 18–22, μ . Diam. colonies up to 225, μ .

The cells of this variety are shaped like the typical *C. limneticus*, but their size is greater than any other variety.

- II. Delavan (rr).

CHROOCOCCUS TURGIDUS (Ktz.) Nägeli.

- Gatt. einz. Algen, 46. 1849; G. S. West, Brit. Freshw. Algae 352. *f.* 166b.
 1904.
 I. Beaver (rr).
 II. Browns (rr).

CHROOCOCCUS GIGANTEUS W. West.

- Jour. Roy. Micr. Soc. 1892. p. 741. *pl.* 10, *figs.* 59–60.
 II. Mary (rrr).

Genus *RHABDODERMA* Schmidle & Lauterborn 1900*RHABDODERMA LINEARE* Schmidle & Lauterborn.

- Ber. d. D. bot. Ges. 18: 148. *pl.* 6, *figs.* 8–11. 1900.
 III. Whitefish (rr).

Genus DACTYLOCOCCOPSIS Hansgirg 1892.

DACTYLOCOCCOPSIS ACICULARIS Lemmermann.

Ber. d. D. bot. Ges. 18: 309. 1900; Kryptogamenfl. d. M. Brandenburg 3:
Algen 1. 51, 44. f. 5. 1907.

II. Browns (sss).

The cells of this species that have been observed have a parietal chromatophore. Lemmermann does not state this fact in his original description of the alga, but parietal chromatophores have been described in the genus by G. S. West (Brit. Freshw. Algae p. 348. 1904). The presence of a parietal chromatophore suggests that the alga is possibly a member of the Chlorophyceae but since its color is a pale blue green it should be placed in the Myxophyceae. (Plate 14, figs. 2-4).

DACTYLOCOCCOPSIS RAPIDIODES Hansgirg.

Prodr. d. Algenfl. v. Böhmen 139. f. 49a. 1892.

III. Reserve (rr), Rice (rr).

Genus APHANOCAPSA Nägeli 1849.

APHANOCAPSA GREVILLEI (Hass.) Rabenhorst

Flora Eur. Algarum 2: 50. 1865.

Coccochloris Grevillei Hassall, Hist. Brit. Freshw. Algae 318. pl. 78, figs.
7-8. 1845.

II. Camp (ss).

III. Beaverdam (rr), Birch (ss), Chetae (sss), Rice (ss), Whitefish (ss).

APHANOCAPSA PULCHRA (Ktz.) Rabenhorst.

Flora Eur. Algarum 2: 49. 1865.

III. Beaverdam (sss), Lac Court Oreilles (ss).

APHANOCAPSA ELACHISTA var. CONFERTA W. & G. S. West.

Jour. Linn. Soc. Bot. 40: 432. pl. 19, f. 1. 1912.

II. Silver (rr).

Genus APHANOTHECE Nägeli 1849.

APHANOTHECE NIDULANS P. Richter.

Bot. Not. 1884: 128.

I. Beaver (Oconomowoc) (ss).

APHANOTHECE NIDULANS var. ENDOPHYTICA W. & G. S. West.

Journ. Linn. Soc. Bot. 40: 432. *pl.* 19, *f.* 14. 1912.

III. Chetac (ss), within colonies of *Coelosphaerium Naegelianum* Unger.

APHANOTHECE STAGNINA (Sprengel) A. Br.

In Rabenhorst Algae No. 1572; Kützing, Tab. Phycol. 1: *pl.* 18, *f.* 3.

III. Whitefish (rr).

APHANOTHECE PRASINA A. Br.

In Rabenhorst, Flora Eur. Algarum 2: 65. 1865; Cooke, Brit. Freshw.

Algae 218. *pl.* 88, *figs.* 3a-3b. 1882.

III. Beaverdam (r).

Genus MICROCYSTIS Kützing 1833.

MICROCYSTIS FLOS-AQUAE (Wittr.) Kirchner.

In Engler & Prantl. nat. Pflanzenfam. 1: Abt. 1a: 56. *fig.* 49N 1898.

II. Browns (cc), Center (cc), Paddock (ss.)

III. Duck (ss), Horseshoe (rr), Shell (rr), Whitefish (ss).

MICROCYSTIS AERUGINOSA Kützing.

Tabulae Phycol. 1: 6. *pl.* 8. 1849.

II. Browns (cc), Delavan (sss), Elizabeth (cc), Hooker (ss), Mill (sss),
Silver (ss).

III. Bear (rr), Devils (rr), Grindstone (rr), Owen (rrr), Pokegema (ss),
Prairie (sss), Rice (ss).

var. MAJOR (Wittr.) G. M. Smith.

Trans. Wis. Acad. Sci. Arts. & Lett. 18²: 535. 1916.

II. Center (rr).

III. Vermilion (ccc).

MICROCYSTIS INCERTA Lemmermann.

Abh. Naturw. Ver. Bremen 17: 342. 1903; Ber. d. D. bot. Ges. 19: 93. *pl.* 4,
fig. 8 1901. (as *Polycystis incerta*).

II. Camp (rr), Hooker (s).

III. Chetek (rr), Prairie (r), Whitefish (rr).

MICROCYSTIS PULVEREA (Wood) Migula.

In Thomé, Flora v. Deut., Deutsch-Österr. u. d. Schw. 6: 36. 1907.

II. Browns (ss), Mill (rrr).

Genus COELOSPHAERIUM Nägeli 1849.

COELOSPHAERIUM KUETZINGIANUM Nägeli.

Gatt. einz. Algen 54: *pl.* 1, *f.* C. 1849.

- II. Browns (rr), Eagle (ss), Elizabeth (s), Green (rr), Hooker (rr), Mary (s), Mill (rrr), Paddock (ss), Silver (rr).
- III. Bear (r), Beaverdam (ss), Grindstone (rr), Horseshoe (rrr), Island (ss), Little Rice (ss), Owen (rrr), Pokegema (rrr), Reserve (ss), Rice (rr), Whitefish (s).

COELOSPHAERIUM NAEGELIANUM Unger.

Mitth. d. Naturw. Ver. f. Steiermark 2: h. 1: *pl.* 2; Borge, Bot. Not. 1900: 10. *pl.* 1, *f.* 5.

- II. Browns (rr), Camp (ccc), Center (a), Elizabeth (r), Hooker (rr), Mill (rr), Paddock (ccc), Silver (ccc).
- III. Amicoy (ss), Bear (s), Beaverdam (ccc), Birch (aa), Chetae (aa), Devils (ss), Duck (ss), Dummy (rrr), Granite (ss), Grindstone (ss), Horseshoe (ss), Island (cc), Littlerice (cc), Number One (ss), Pokegema (s), Prairie (ss), Rice (cc), Whitefish (ccc).

Genus GOMPHOSPHAERIA Kützing 1836.

GOMPHOSPHAERIA APONINA Kützing.

Decades 16: No. 151. 1836; Tabulae Phycol. 1: 22. *pl.* 31, *f.* 3. 1849.

I. Pine (rr).

- II. Browns (rr), Center (rr), Eagle (rr), Elizabeth (rr), Mary (rr), Silver (rr).

var. CORDIFORMIS Wolle.

Bull. Torr. Bot. Cl. 9: 25. *pl.* 13, *f.* 11. 1882.

- III. Beaverdam (sss).

GOMPHOSPHAERIA LACUSTRIS Chodat.

Bull. Herb. Boiss. 6: 180. *f.* 1. 1898; W. & G. S. West, Trans. R. Irish Ac. 33: sec. B²: 112. *pl.* 11, *figs.* 24-27. 1906.

I. Mendota (s).

- III. Beaverdam (e).

Genus MERISMOPEDIA Meyen 1828.

MERISMOPEDIA TENUISSIMA Lemmermann.

Bot. Cent. 76: 154. 1898; Forschungsbr. a. d. Biol. Stat. zu Plön 7: 132. *pl.* 1, *f.* 21. 1899.

- II. Camp (rr), Mary (rr).

MERISMOPEdia GLAUca (Ehr.) Nägeli.

Gatt. einz. Algen 55. pl. 1, f. D¹. 1849.

II. Mill (rr).

III. Lac Court Oreilles (rrr).

MERISMOPEdia ELEGANS A. Br.

In Kützing, Species Algarum 472. 1849; G. S. West, Brit. Freshw. Algae 348. f. 162. C. 1904.

II. Center (rr).

III. Beaverdam (r).

Order Hormogoneales.

Family OSCILLATORiaceae

Genus LYNGBYA C. A. Agardh 1824.

LYNGBYA BIRGEI G. M. Smith.

Bull. Torr. Bot. Cl. 43: 482. pl. 26, f. 28. 1916.

II. Elizabeth (ss), Mary (ss).

Genus TRICHODESMIUM Ehrenberg 1830.

TRICHODESMIUM LACUSTRE Klebahn.

Forschungsbr. a. d. Biol. Stat. zu Plön 3: 13. 1895; Flora 80: 271. pl. 4, figs. 31-33. 1895.

The general manner of growth of this alga suggests *Aphanizomenon*, but a careful search has failed to demonstrate the presence of heterocysts. It differs from sterile specimens of *Aphanizomenon* in the shorter and relatively broader cells. (Plate 14, fig. 5).

III. Island (r), Rice (rr).

Family NOSTOCACEAE

Genus ANABAENA Bory de St. Vincent 1823.

ANABAENA PLANCTONICA Brunthaler.

Sitzbr. d. Kais. Ak. d. Wiss. Wien. 112¹: 292. 1903.

II. Center (cc).

ANABAENA MACROSPORA var. *ROBUSTA* Lemmermann.

Bot. Cent. 76: 154. 1898.

II. Camp (ccc).

ANABAENA AUGSTUMALIS var. *MARCHICA* Lemmermann.

Forschungsbr. a. d. biol. Stat. zu Plön 12: 147. 1905.

II. Center (cc).

ANABAENA LEMMERMANNI P. Richter.

In Lemmermann, Forschungsbr. a. d. biol. Stat. zu Plön 10: 153. 1903.

III. Reserve (r), Rice (sss).

ANABAENA FLOS-AQUAE (Lyngbye) de Bréb.

Mem. de la soc. Acad. de Falaise 1835: 36.

II. Browns (cc), Camp (ss), Eagle (sss), Green (sss), Hooker (r), Mary (rr), Mill (ss), Paddock (ccc).

III. Lac Court Oreilles (ccc), Shell (rrr).

ANABAENA HASSALLII (Ktz.) Wittrock.

Algae exsicc. Fasc. 21: 56.

II. Center (s).

var. *MACROSPORA* Wittrock.

Algae exsicc. Fasc. 21: 56.

II. Camp (sss).

ANABAENA SPIROIDES var. *CRASSA* Lemmermann.

Bot. Cent. 76: 155. 1898; Kryptogamenfl. d. M. Brandenburg 3: Algen 1: 188. 159. *figs* 15-16. 1907.

II. Hooker (ccc).

III. Granite (ccc), Vermilion (c).

Genus *APHANIZOMENON* Morren 1838.

APHANIZOMENON FLOS-AQUAE (L) Ralfs.

Ann. & Mag. of Nat. Hist. 5: 340. *pl.* 9, *f.* 6. 1850.

II. The alga produced a bloom in Amicoy and the Chetek group of lakes that filled the entire lake. The appearance of

a bloom of this alga is quite striking since, to the naked eye, the lake appears to be filled with small pieces of macerated grass.

II. Camp (r), Center (rrr), Green (ss), Hooker (cc).

III. Amicoy (aa), Bear (rr), Beaverdam (rr), Birch (ss), Chetac (sss), Chetek (a), Granite (a), Horseshoe (r), Island (ccc), Little Rice (sss), Pokegama (a), Prairie (aa), Reserve (rr), Rice (ss), Shell (rrr), Vermilion (r), Whitefish (rr).

Family RIVULARIACEAE

Genus RIVULARIA (Roth) C. A. Agardh 1824.

RIVULARIA ECHINULATA (Smith) Born. et Flah.

Bull. Soc. Bot. France 31: 77. 1884; P. Richter, Forschungsbr. a. d. biol. Stat. zu Plön 2: 31. figs.1-8. 1894.

III. Bear (rr), Beaverdam (rr), Birch (ss), Chetac (ss), Duck (rr), Dummy (rr), Grindstone (rr), Horseshoe (ss), Island (ss), Lac Court Oreilles (ss), Owen (rr), Reserve (rr), Shell (rr), Whitefish (sss).

Class CHLOROPHYCEAE.

Order Volvocales.

Family VOLVOCACEAE.

Genus GONIUM Mueller 1773.

GONIUM PECTORALE Mueller.

Vermium terrestrium et fluviatilum etc. 1: 60. 1773.

The mucous projections between the individual cells are more fully developed in the plankton individuals of this species. (Plate 10, figs. 1-2).

III. Beaverdam (rrr), Duck (rr), Island (r), Number One (rr).

Genus PANDORINA Bory de St. Vincent 1824.

PANDORINA MORUM Bory de St. Vincent.

Encyc. meth. Hist. Nat. de Zoophytes 2: 600. 1824; G. S. West, Brit. Freshw. Algae 193. figs. 76a-76h. 1904.

II. Camp (rr), Center (cc), Hooker (s).

III. Birch (rr), Chetac (rr), Chetek (sss), Duck (ss), Grindstone (s), Lac Court Oreilles (ss), Little Rice (r), Number One (rr), Pokegama (r), Prairie (r), Reserve (rr), Rice (r), Whitefish (ss).

Genus EUDORINA Ehrenberg 1832.

EUDORINA ELEGANS Ehrenberg.

- Abh. d. Kgl. Ak. d. Wiss. zu Berlin Jahrgang 1831: 78. pl. 2, f. 10. 1832.
II. Camp (cc), Center (sss), Delavan (sss), Elizabeth (rr), Green (rr),
Paddock (r), Silver (ccc).
III. Bear (ss), Beaverdam (sss), Birch (ss), Bryer (rr), Chetac (ss),
Duck (s), Grindstone (rrr), Horseshoe (rr), Island (ss), Lac
Court Oreilles (rr), Number One (rr), Pokegama (ss), Prairie
(ss), Reserve (rr), Rice (ss), Vermilion (rr).

Order Protococcales

Family PALMELLACEAE.

Genus SPHAEROCYSTIS Chodat 1897.

SPHAEROCYSTIS SCHROETERI Chodat.

Bull. Herb. Boiss. 5: 119 pl. 9, figs. 1-12. 1897.

- II. Browns (rr), Camp (rr), Center (rr), Eagle (rr), Elizabeth (sss),
Green (rr), Hooker (rr), Mary (ss), Mill (sss), Silver (r).
III. Bear (ss), Birch (ss), Chetac (ss), Chetek (cc), Lac Court Oreilles
(rr), Number One (cc), Pokegama (ss), Prairie (ss), Rice (ss),
Shell (ccc).

Genus GLOEOCYSTOPSIS G. M. Smith.

GLOEOCYSTOPSIS LIMNETICUS G. M. Smith.

Bull. Torr. Bot. Cl. 43: 475. pl. 24, fig. 12. 1916.

In the few colonies observed the chloroplast was distinctly parietal with a single pyrenoid. The original description states that the chloroplast is diffuse; so should be amended to describe the parietal chloroplast of the younger cells. This same condition has been observed in *Nephrocystium* where the chloroplast is parietal in young cells, but becomes indistinct as the cell grows older.

- III. Beaverdam (rrr).

Planktosphaeria n. gen.

Cells spherical, embedded in a copious, non-lamellated, hyaline, gelatinous sheath; at first solitary, later irregularly distributed within the colony. Mature cells with several parietal,

polygonal chloroplasts, each containing a single pyrenoid. Reproduction by liberation of daughter colonies through breaking down of gelatinous sheath.

Planktosphaeria gelatinosa n. sp.

Characters the same as genus. Diam. cells 25–4.5 μ ; diam. colon. up to 150 μ (Plate 10, figs. 8–11).

The numerous parietal chloroplasts form the distinguishing characteristic of the genus. At first glance this condition might be considered a division stage in the reproduction of a *Sphaerocystis* cell, but I am convinced that it is the normal state of the adult cell. The very young cells have a single parietal bell-shaped chloroplast but as the cell grows the number of chloroplasts increases.

I. *Mendota* (rr).

II. Browns (rr).

Genus **ASTEROCOCCUS** Scherffel 1908.

Asterococcus limneticus n. sp.

Colonies spherical, rarely ovoid, of 4, 8, or 16 cells widely separated within a hyaline, unlamellated, gelatinous matrix. Chloroplasts, star shaped, with 4–8 rays coming from a central mass and ending in a disc at the cell wall. Pyrenoid, single, at the center of the rays. (Plate 10, figs. 3–6).

Diam. cells 7.5–23 μ ; diam. colon. up to 125 μ .

The genus *Asterococcus* was described by Scherffel (Ber. d. D. bot. Ges. (26A: 762. 1908.) because *Pleurococcus superbus* Cienk. differs so markedly from other species of that genus. The two distinguishing characteristics of *Asterococcus* are a lamellated gelatinous envelope around the cells, and a single star-shaped chloroplast in which strands ending in discs run from the center of the cell to the periphery. There is but one pyrenoid at the center of the cell. Scherffel's figures for the vegetative cells are not particularly good but Chodat (Bot. Ztg. 53: pl. 5, figs. 6, 9, 19, 21, 1895) has given some very characteristic figures of *A. superbus* (Cienk) Scherffel as stages in the life history of *Eremosphaeria*.

The species that I have described above does not have the

lamellated gelatinous envelope but the star shaped chloroplast is so characteristic of *Asterococcus* that I believe it belongs in the genus. The cells are also much smaller than those of *A. superbis*.

- III. Dummy (rr), Horseshoe (ss), Lac Court Oreilles (ss), Owen (cc), Reserve (r), Shell (cc).

Family DICTYOSPHAERIACEAE
Genus DICTYOSPHAERIUM Nägeli 1849.

DICTYOSPHAERIUM PULCHELLUM Wood.

Smithsonian Cont. to Knowl. 19: No. 241: 84. pl. 10, f. 4. 1872. (*Botryococcus pulchellus* on plate).

- II. Center (r), Eagle (rr), Elizabeth (rrr).
III. Amicoy (ss), Bear (ss), Chetek (ss), Duck (cc), Dummy (sss), Granite (ss), Grindstone (rrr), Horseshoe (ss), Lac Court Oreilles (ss), Little Rice (sss), Owen (rrr), Pokegama (c), Prairie (c), Reserve (rr), Rice (ss), Shell (cc), Vermilion (r), Whitefish (rr).

Genus DIMORPHOCOCCUS A. Br. 1849.

DIMORPHOCOCCUS LUNATUS A. Br.

Alg. unicell. 44. 1855: Rabenhorst, Flora Eur. Algarum 3: 36. 6, f. a-c 1868.

- I. Pine (rrr).
III. Bear (rr), Beaverdam (rr), Devils (r), Horseshoe (rr), Shell (rrr).

Genus WESTELLA de Wildemann 1897.

WESTELLA BOTRYOIDES (W. West) de Wildemann.

Bull. Herb. Boiss. 5: 532. 1897.

Tetracoccus botryoides W. West, Jour. Roy. Micr. Soc. 1892: 735 pl. 10, figs. 43-48.

- II. Mill (rrr).
III. Horseshoe (rr).

var. **major** var. nov.

Cells 8-13 μ in diam.

The size of the cells in this variety is much larger than that of the typical form. The cells are generally in groups of four and the old mother cell wall that holds them together is inconspicuous.

- III. Whitefish (rr).

Family AUTOSPORACEAE
Genus NEPHROCYTIUM Nägeli 1849.

NEPHROCYTIUM AGARDHIANUM Nägeli.

Gatt. einz. Algen 79. *pl.* 3, *fig.* C. 1849.

II. Camp (rr), Mill (rrr).

III. Bear (rrr).

Genus OOCYSTIS Nägeli 1855.

OOCYSTIS SOLITARIA Wittrock.

Bot. Not. 1879. *p.* 24. *Figs.* 1-5.

II. Hooker (r.)

var. MAJOR Wille.

Öfvers. Kgl. Sv. Vet.-Ak. Förh. 36: No. 5: 26. 1879.

III. Rice (rr).

OOCYSTIS LACUSTRIS Chodat.

Bull. Herb. Boiss. 5: 296. *pl.* 10, *figs.* 1-7. 1897.

II. Camp (sss), Center (s), Mary (r).

III. Chetek (r), Dummy (rr), Pokegama (r), Prairie (rr), Reserve (rr).

OOCYSTIS PARVA W. & G. S. West.

Jour. of Bot. 36: 335. 1898.

I. Beaver (rr).

OOCYSTIS ELLIPTICA W. West.

Jour. Roy. Micr. Soc. 1892: 736. *pl.* 10, *f.* 56.

II. Amicoy (rr).

var. MINOR W. West.

Jour. Roy. Micr. Soc. 1892: 736; W. & G. S. West, *ibid.* 1894: 14. *pl.* 2, *f.* 26.

II. Camp (sss).

OOCYSTIS BORGEI Snow.

Bull. U. S. Fish Comm. 1902: 379. *pl.* 2, *figs.* 7^a-7^b. 1903.

II. Camp (r), Green (rr).

OOCYSTIS GLOEOCYSTIFORMIS Borge.

Botaniska Studier tillägnade F. R. Kjellmann 23. *pl.* 1, *f.* 1. 1906.

III. Lac Court Oreilles (sss).

OOCYSTIS NOVAE-SEMLIAE var. **MAXIMA** W. & G. S. West.

Jour. Roy. Micr. Soc. 1894: 13. *pl.* 2, *f.* 25.

III. Duck (r).

Oocystis eremosphaeria sp. nov.

Cells ovoid, 2-1½ times as long as broad, solitary or in families of 2-4. Chloroplasts numerous, lens shaped, each containing a single pyrenoid. Cell wall thick, with a conspicuous nodule at each pole. (Plates 14, figs. 8-9).

Cells 45-35 μ long, 31-23 μ wide. Families up to 100 x 60 μ .

The large size of the individual cells together with the numerous chloroplasts at once distinguishes this from all other species. Playfair (Proc. Linn. Soc. N. S. Wales 41: 106-147. 1916) has recently attempted to show that *Eremosphaeria viridis* de Bary is merely a polymorphic condition of *Oocystis* and not a distinct species. The species which is described above is much more like *E. viridis* than any other *Oocystis* species but the cells always have the ovoid shape and polar nodule so characteristic of *Oocystis*. There is, in my opinion, no evidence for regarding *E. viridis* as a growth form of *Oocystis*.

III. Beaverdam (rr), Shell (sss).

Oocystis natans var. **major** var. nov.

Cells 38-31 x 25-16 μ . Families up to 120 x 90 μ . (plate 15, figs. 6-7).

This variety has the typical star shaped chloroplast containing a single pyrenoid but the cells are much larger.

III. Birch (sss), Chetac (s).

Genus MICRACTINIUM Fresenius 1858**MICRACTINIUM PUSILLUM** Fresenius.

Abh. Senckenb. Naturf. Ges. 2: 236. *pl.* 11, *figs.* 46-49. 1858; G. M. Smith. Bull. Torr. Bot. Cl. 43: 479. *pl.* 25, *f.* 18. 1916.

II. Hooker (rr).

III. Chetek (rr), Island (rrr), Pokegama (rr), Prairie (rr).

var. *elegans* var. nov.

Cells with 5–7 bristles. (Plate 12, fig. 4).

This new variety is justifiable since the cells of all the colonies in the plankton of this lake possessed 5–7 bristles, whereas cells ordinarily have but 2–4.

III. Rice (rr).

MICRACTINIUM QUADRASETUM (Lemm.) G. M. Smith

Bull. Torr. Bot. Cl. 43: 479. *pl.* 25, *f.* 17. 1916.

II. Camp (rr), Eagle (rrr).

MICRACTINIUM RADIATUM (Chodat) Wille.

In Engler u. Prantl. Nat. Pflanzenfam. 1² (Nachtr): 57. 1909.

Golenkinia radiata Chodat, Jour. de Bot. 8: 303. *pl.* 3, *figs.* 1–24. 1894.

II. Green (rrr).

MICRACTINIUM PAUCISPINUM (W. & G. S. West) Printz

Kristiana Vidensk. Skr. I. Mat.–Nat. Kl. 1913: No. 6: 55. 1914.

Golenkinia paucispina W. & G. S. West, Trans. R. Irish Ac. 32: sec. B¹; 68. *pl.* 1, *f.* 18. 1902.

III. Prairie (rr).

Genus TETRAEDRON Kützing 1845.

TETRAEDRON MUTICUM forma PUNCTULATUM (Reinsch) de Toni.

Sylloge algarum 1: 600. 1889.

Polyedrium muticum var. *punctulatum* Reinsch, Notarisia 3: 498. *pl.* 4, *f.* 6. 1888.

III. Beaverdam (rr).

TETRAEDRON MINIMUM (A. Br.) Hansgirg.

Hedwigia 27: 131. 1888; G. S. West, Brit. Freshw. Algae 231. *f.* 101a. 1904.

I. Beaver (rr).

II. Camp (rr), Paddock (rrr).

TETRAEDRON CAUDATUM (Corda) Hansgirg.

Hedwigia 27: 131. 1888; G. S. West, Brit. Freshw. Algae 231. *f.* 101b. 1904.

III. Reserve (rrr).

TETRAEDRON TRIGONUM (Nägeli) Hansgirg.

Hedwigia 27: 130. 1888.

III. Rice (rrr).

Tetraedron verrucosum sp. nov.

Cells four-angled, with convex sides, tetrahedric or with the two-sides crossed over one another. Angles obtuse, with a thick projection 13-18 μ long. Wall thick, verrucose. (Plate 15, figs. 1-2).

Diam. cells 65-80 μ .

The shape of the cell is at times like *T. regulare* Ktz. but *T. verrucosum* differs in its larger size and verrucose walls. The warts on the walls are more pronounced than in any other species of the genus.

III. Bear (rr).

TETRAEDRON PROTEIFORME (Turner) Brunnthaler.

In Pascher, D. Süßwasserfl. Deutschl., Österr. u. d. Schw. 5: Chlorophyceae 2: 152. f. 177. 1915.

Polyedrium proteiforme Turner, Kgl. Sv. Vet.-Ak. Handl. 25: No. 5: 158. pl. 20, f. 24B. 1892.

Turner states that the cells may be either two or three-angled, but no two-angled cells were observed in the Wisconsin collections. This species forms a connecting link between the genera *Tetraedron* and *Cerasterias*. (Plate 15, figs. 4-5).

II. Paddock (rrr).

III. Lac Court Oreilles (rr), Rice (rrr).

TETRAEDRON ENORME (Ralfs) Hansgirg.

Hedwigia 27: 132. 1888.

Stäurastrum enorme Ralfs, Brit. Desmidiaceae 140. pl. 33, figs. 11a-11e. 1848.

III. Devils (r).

TETRAEDRON LOBULATUM var. POLYFURCATUM G. M. Smith.

Bull. Torr. Bot. Cl. 43: 480, pl. 26, figs. 21-22. 1916.

III. Beaverdam (rr), Rice (rr), Shell (rrr).

TETRAEDRON LIMNETICUM Borge.

Bot. Not. 1900: 5. pl. 1, f. 2.

II. Chetek (r), Island (rr).

TETRAEDRON PLANCTONICUM G. M. Smith.

Bull. Torr. Bot. Cl. 43: 479. pl. 26, figs. 19-20. 1916.

III. Devils (sss), Granite (rr), Horseshoe (rr), Prairie (rr), Vermilion (r).

TETRAEDRON GRACILE (Reinsch) Hansgirg. (Plate 6, fig. 3).

Hedwigia 28: 19. 1889.

Polyedrium gracile Reinsch, Notarisia 3: 502. pl. 7, f. 1. 1888.

II. Elizabeth (rr).

Genus POLYEDRIOPSIS Schmidle 1899.

POLYEDRIOPSIS SPINULOSA Schmidle.

Allg. Bot. Zeitschr. 5: 17. 1899.

Tetraedron spinulosum Schmidle, Allg. bot. Zeitschr. 2: 193. fig. 2, 1896.

The general tendency among phycologists has been to place this alga in the genus *Tetraedron*, where it was first described, and to consider *Polyedriopsis* unworthy of specific rank. The bristles which are found on the corners of the cells are the same type as those found on *Lagerheimia* and *Micractinium* and, in my opinion, *Poyledriopsis* forms a genus parallel with *Tetraedron* just as *Lagerheimia* does with *Oocystis*. (Plate 12, figs. 2-5).

III. Prairie (rr).

Genus ANKISTRODESMUS Corda 1838.

ANKISTRODESMUS FALCATUS var. ACICULARIS (A. Br.) G. S. West.

Brit. Freshw. Algae 223. figs 94B-94C. 1904.

III. Beaverdam (rr), Rice (rr).

ANKISTRODESMUS FALCATUS var. MIRABILIS (W. & G. S. West)
G. S. West.

Brit. Freshw. Algae 224. fig. 94E. 1904.

III. Bear (rr), Bryer (rr), Devils (rr), Dummy (rr), Horseshoe (rr), Reserve (rr), Whitefish (rr).

ANKISTRODESMUS LACUSTRIS (Chod.) Ostenfeld. (Plate 11, fig. 1).

Hedwigia 46: 384. 1907.

II. Browns (rr).

ANKISTRODESMUS SPIRALE (Turner) Lemmermann.

Arch. f. Hydrobiol. u. Planktonkde. 4: 176. 1908.

Raphidium spirale Turner, Kgl. Sv. Vet.-Ak. Handl. 25: No. 5: 156. pl. 20. f. 26. 1892.

Ankistrodesmus falcatus var. *spiralis* (Turner) G. S. West, Brit. Freshw. Algae 224. 1904.

II. Silver (rrr).

Genus CLOSTERIOPSIS Lemmermann 1898.

CLOSTERIOPSIS LONGISSIMA var. TROPICA W. & G. S. West.

Trans. & Proc. Bot. Soc. Edinb. 23: 1: 31. pl. 1, f. 1. 1905.

Raphidium longissimum var. *tropicum* W. & G. S. West, Trans. Linn. Soc. Bot. 2nd Ser. 6: 198. 1902.

The dimensions of the Wisconsin material agree with those given in the original description and not with those found in the plankton from Scotland.

I. North Turtle (rr).

Genus SCHROEDERIA Lemmermann 1898.

SCHROEDERIA JUDAYI G. M. Smith.

Bull. Torr. Bot. Cl. 43: 474. pl. 24, figs. 9-11. 1916.

II. Camp (rrr).

III. Amicoy (rr), Prairie (rr).

Genus QUADRIGULA Printz 1915.

Quadrigula Pfitzeri (Schröder) n. comb.

Ankistrodesmus Pfitzeri (Schröder) G. S. West, Brit. Freshw. Algae 224. figs. 94G-94H. 1904.

Printz has recently founded the genus *Quadrigula* to include those *Ankistrodesmus* species whose cells lie side by side within a common gelatinous envelope. He places *Ankistrodesmus*

Pfitzeri (Schroder) G. S. West as a synonym of *Quadrigula closterioides* (Bohl.) Printz but since it is an open question whether these two organisms are identical or not the specific name *Pfitzeri* is retained.

III. Beaverdam (rr), Lac Court Oreilles (rr), Reserve (rr), Rice (rr), Shell (rr), Whitefish (rrr).

Genus ELAKTOTHRIX Wille 1898.

ELAKTOTHRIX AMERICANA Wille.

Rhodora 1: 150. 1899.

Fusola viridis Snow, Bull. U. S. Fish Comm. 1902: 389. pl. 2, figs.

VI¹-VI⁴. 1903.

I. Soft (rr).

Genus SELENASTRUM Reinsch 1867.

SELENASTRUM GRACILE Reinsch.

Die Algenfl. d. mitt. Th. v. Franken 65. pl. 4, f. 3. 1867.

III. Bear (rr), Prairie (rr), Whitefish (rrr).

SELENASTRUM BIBRAIANUM Reinsch.

Die Algenfl. d. mitt. Th. v. Franken 64. pl. 4, f. 2. 1867.

III. Beaverdam (rr), Rice (rr).

Genus KIRCHNERIELLA Schmidle 1893.

KIRCHNERIELLA LUNARIS (Kirchner) Möbius.

Abh. d. Senckenb. Naturf. Ges. 18: 331. 1894.

II. Elizabeth (rr), Green (rrr), Mill (rr), Paddock (rr).

III. Bear (rr), Beaverdam (rr), Chetek (rr), Devils (rr), Duck (rr), Dummy (sss), Horseshoe (rr), Pokegama (sss), Prairie (sss), Shell (r).

KIRCHNERIELLA OBESA (W. West) Schmidle.

Ber. d. Naturf. Ges. zu Freiburg i. B. 1893: 15 (82). pl. 7, f. 2. 1893.

II. Camp (rr).

III. Chetae (r), Lac Court Oreilles (ss), Reserve (r), Rice (rr), Whitefish (rrr).

var. **major** (Bernard) comb. nov.

Kirchneriella major Bernard, Protocc. et Desm. d'eau douce 179. pl. 14, figs. 398-399. 1908.

The blunt apices and general outline of the cells resembles the typical form, but the space between the apices is much broader and deeper. The resemblance to *K. obesa* is so close, however, that this alga should be placed as a variety and not a distinct species. Schmidle (Flora 78:44 pl. 7, f. 3. 1894) has figured a *K. obesa* that is identical with this variety. (Plate 10, fig. 7).

III. Lac Court Oreilles (r).

KIRCHNERIELLA ELONGATA G. M. Smith.

Bull. Torr. Bot. Cl. 43: 473. pl. 24, f. 7. 1916.

In the original description of the species I was uncertain whether or not a pyrenoid exists. During the past summer living material was studied with this point in view and none being found, the description should be amended to state that no pyrenoid is present.

III. Devils (rr), Lac Court Oreilles (rr).

Genus **ACTINASTRUM** Lagerheim 1882.

ACTINASTRUM HANTZSCHI Lagerheim.

Öfvers. Kgl. Vet.-Ak. Förh. 39: No. 2: 70. pl. 3, figs. 25-26. 1882.

Although the occurrence of this alga was noted in the preliminary list the multiple colonies have only been found in Chetek Lake.

III. Chetek (rr), Prairie (rr).

var. **elongatum** var. nov.

Cells 33-37 x 5-4.5 μ . (Plate 12, fig. 3).

The cells of this variety are considerable longer than the typical *A. Hantzschii*.

III. Bear (rr).

Genus SCENEDESMUS Meyen 1829.

SCENEDESMUS OBLIQUUS (Turp.) Kützing.

Linnaea 8: 609. 1833; G. S. West, Brit. Freshw. Algae 220. *fig.* 92A. 1904.
III. Rice (rr).

SCENEDESMUS BIJUGA (Turb.) Lagerheim.

Nuova Notarisia 1893: p. 158; G. S. West, Brit. Freshw. Algae 220. *fig.*
92C. 1904.
II. Mill (rr), Silver (rr).

SCENEDESMUS ARCUATUS Lemmermann.

Forschungsbr. a. d. Biol. Stat. zu Plön 7: 112. *pl.* 1, *figs.* 2-4. 1899.
II. Camp (rrr), Center (ss), Paddock (rrr).
III. Beaverdam (rr), Lac Court Oreilles (rrr), Owen (rrr), Reserve (rr),
Shell (rrr).

var. *capitatus* var. nov.

Cells with nodular thickening at poles. Dimens. cells,
11-23 x 5-11 μ . (Plate 11, *figs.* 4-5).

II. Center (rr).

var. PLATYDISCA G. M. Smith.

Trans. Wis. Acad. Sci. Arts. & Lett. 18²: 451. *pl.* 30, *figs.* 101-105. 1916.
I. Pine (rr).
II. Camp (rrr), Eagle (rr), Paddock (rr).

SCENEDESMUS DENTICULATUS Lagerheim.

Öfvers. Kgl. Vet.-Ak. Förh. 39: No. 2: 61. *pl.* 2, *figs.* 13-17. 1882.
II. Browns (rr), Silver (rrr).
III. Amicoy (rr).

SCENEDESMUS ACUTIFORMIS Schröder.

Forschungsbr. a. d. Biol. Stat. zu Plön 5: 45. *pl.* 2, *figs.* 4a-4b. 1897.
III. Rice (rrr).

SCENEDESMUS BRASILIENSIS Bohlin.

Bih. t. Kgl. Vet.-Ak. Handl. 23: Afd. 3: No. 7: 22. *pl.* 1, *figs.* 36-37. 1897.
III. Beaverdam (rrr), Prairie (rr), Rice (rr).

SCENEDESMUS ARMATUS (Chodat) G. M. Smith

- Trans. Wis. Acad. Sci. Arts & Lett. 18²: 460. *pl.* 29, *figs.* 90-93. 1916.
II. Browns (rr), Silver (rr).
III. Reserve (rrr).

SCENEDESMUS ABUNDANS (Kirchner) Chodat.

- Matér. p. la flora crypt. Suisse 4²: 77. 1913; G. M. Smith, Trans. Wis. Acad. Sci. Arts. & Lett. 18²: 465. *pl.* 31, *figs.* 137-140. 1916.
I. Oconomowoc (rr).

var. LONGICAUDA G. M. Smith.

- Trans. Wis. Acad. Sci. Arts. & Lett. 18²: 467. *pl.* 30, *figs.* 121-125. 1916.
II. Camp (rr).
III. Rice (rr).

SCENEDESMUS LONGUS Meyen.

- Nova Acta Acad. Phys.-Med. Leop.-Caes. Nat. Cur. 14: 774. *pl.* 43, *f.* 28. 1829.
II. Camp (rr).

SCENEDESMUS QUADRICAUDA (Turp.) de Bréb.

- Mem. de la Soc. Ac. de Falaise 1835: 66, G. S. West, Brit. Freshw. Algae 220, *figs.* 92D-92F. 1904.
II. Browns (rr), Camp (rr), Eagle (rr), Mary (rr) .
III. Beaverdam (rr), Chetek (rr), Pokegama (rrr), Rice (r).

var. WESTII G. M. Smith.

- Trans. Wis. Acad. Sci. Arts. & Lett. 18²: 480. *pl.* 32, *figs.* 177-180. 1916.
II. Camp (rr), Silver (rr).
III. Lac Court Oreilles (rr).

var. MAXIMUS W. & G. S. West.

- Trans. Linn. Soc. Bot. 2nd. Ser. 5: 83. *pl.* 5, *figs.* 9-10. 1895.
II. Eagle (rr).

Genus CRUCIGENIA Morren 1830.

CRUCIGENIA RECTANGULARIS (Nägeli) Gay.

Recherches sur le dév. et la class. de quelques algues vertes 100. *pl.* 15, *f.* 151. 1891.

II. Mill (rrr), Paddock (rr).

III. Beaverdam (rr), Lac Court Oreilles (rrr).

CRUCIGENIA IRREGULARIS Wille.

Biol. Cent. 18: 302. 1898; *Nyt. Mag. f. Naturvidensk* 38: 10, *pl.* 1, *f.* 15. 1900; W. & G. S. West, *Trans. & Proc. Bot. Soc. Edinburg* 23: 29, *pl.* 1, *figs.* 6-7. 1905.

The cells of some of the smaller colonies from the plankton of Browns Lake were regularly arranged in the coenobe. This suggests a very large variety of *C. rectangularis* (Nägeli) Gay but I consider them colonies of *C. irregularis*. In addition to differences in cellular arrangement, the two species differ considerably in size so that the two need not be confused even though the cells are at times regularly arranged. Although most investigators state that pyrenoids are not found in the chloroplasts of *C. irregularis*, I have generally found them present. (Plate 11, *figs.* 2-3).

II. Browns (rr), Camp (rr).

III. Reserve (rrr).

CRUCIGENIA LAUTERBORNEI Schmidle.

Allg. Bot. Zeits. 6: 234. 1900; Chodat, *Matér. p. 1. fl. crypt. Suisse* 1²: 206. *fig.* 127. 1902.

Cells 4.5-9 μ , wide, 8-15 μ long. Coenobes 15-25 μ in diam. Multiple coenobia up to 150 μ in diam.

In the formation of the young coenobia, there is a rupture of the cell wall into two and not four parts as is generally stated. The gelatinous sheath enclosing the colony is very delicate and easily overlooked. The statement is generally made that the coenobes are held together by the gelatinous sheath of the colony. This sheath may play a part in holding the cells of the colony together, but the remnants of the old mother cell wall are also important and play the same rôle as in *Dictyosphaerium*, *Westella* and *Dimorphococcus*. (Plate 12, *fig.* 1).

III. Chetek (rrr), Pokegema (rr), Prairie (rr), Rice (rr).

Genus COELASTRUM Nägeli 1849.

COELASTRUM MICROPORUM Nägeli.

- In Braun, Alg. Unicell. 70. 1855; Senn. Bot. Ztg. 57: 53. *pl. 2, figs. 11-17.*
1899.
II. Browns (rr), Center (rr), Elizabeth (rr), Mary (rr), Mill (rrr), Silver (rr).
III. Bear (rr), Chetac (rr), Granite (rr), Island (rr), Prairie (rrr), Shell (rrr), Vermilion (rr).

COELASTRUM CAMBRICUM Archer.

- Quart. Jour. Micr. Sci. N. S. 8: 65. 1868; W. West, Jour. of Bot. 31: 99.
pl. 333, f. 14. 1893.
II. Silver (rr).
III. Beaverdam (rr), Owen (rrr), Prairie (rrr).

COELASTRUM RETICULATUM (Dang.) Senn.

- Bot. Ztg. 57: 66. *pl. 2, figs. 1-10.* 1899.
II. Browns (sss), Camp (r), Eagle (rr), Mary (rr).
III. Bear (rr), Beaverdam (rr), Birch (rrr), Lac Court Oreilles (rr), Reserve (rr), Rice (rr).

Genus SORASTRUM Kützing.

SORASTRUM AMERICANUM (Bohl.) Schmidle.

- Engl. Jahrb. 27: 230. Lemmermann, Arch. f. Hydrobiol. u. Planktonkde.
5: 310. *f. 5.* 1910.

Little is known concerning the manner of reproduction of this alga, the general assumption being that it forms autospores in the same manner as *Coelastrum*. Many of the cells of the colonies from Devils Lake had lost their contents through a silt-like opening, while the very young colonies of the variety *undulatum* were enclosed in a hyaline gelatinous envelope (fig. 6).

This suggests a formation of zoospores as in *Pediastrum* but the genus is left in the conventional place until these have been observed. (Plate 13, figs. 6, 8).

- III. Devils (rr).

var. *undulatum* var. nov.

Sides of base of stipe forming central sphere undulate instead of straight. (Plate 13, fig. 7).

- III. Beaverdam (rrr).

Family PLANOSPORACEAE.
Genus CHARACIUM A. Br. 1849.

CHARACIUM STIPITATUM (Bachm.) Wille.

In Engler & Prantl, Nat. Pflanzenfam. 1²: (Nachtr.) 45. 1909; G. M. Smith. Bull. Torr. Bot. Cl. 43: 472. pl. 24, figs. 4-6. 1916.

This species is confined exclusively to *Coelosphaerium Naegelianum* Unger.

III. Amicoy (r), Beaverdam (sss), Devils (ss), Horseshoe (ss).

Characium curvatum sp. nov.

Cells lunar or recurved, with acute or sub-acute apices. Stipe hyaline, thick, tubular or conical, frequently with an irregular outline. Chloroplast parietal, with or without a pyrenoid. (Plate 11, figs. 6-13).

Length of cell (with stipe) 13-22 μ , (without stipe) 8-18 μ ; Breadth 3-6 μ . Epiphytic upon *Coelosphaerium Naegelianum* Unger, *Dictyosphaerium pulchellum* Wood, and *Phaeococcus planctonicus* W. & G. S. West.

The general manner of growth suggests *C. stipitatum* (Bachm.) Wille but this alga has curved cells and a much broader stipe. Whenever the host colony contains the alga, 50-200 individuals are generally present. It has been found in the sheath of colonial forms of the Myxophyceae, Chlorophyceae and Phaeophyceae, which further distinguishes it from *C. stipitatum* that is confined to a single alga.

III. Birch (cc), Chetac (a), Dummy (rr), Horseshoe (ss), Shell (ss).

CHARACIUM LIMNETICUM Lemmermann.

Bot. Not. 1903: 81. pl. 3, figs. 7-10.

The dimensions of the alga found in Browns lake agree in general with those given by Lemmermann but the cells attain a larger size, the largest being 110 μ long and 12 μ wide. The chloroplast contains one and not two pyrenoids. The stipe of the Wisconsin form differs from that described by Lemmermann in being somewhat thicker and without a basal disc. Lemmermann thinks that the 4 band-shaped chloroplasts represents stages in the cleavage of the cell contents to form zoospores. I

have found that 4-8 chloroplasts are constantly present in the larger cells and consider this presence of several parietal cylindrical chloroplasts the normal condition of the vegetative cell and not a stage in its reproduction. The species also resembles *C. gracilipes* Lambert but only reaches the minimal dimensions of *C. gracilipes*. (Plate 11, figs. 14-18).

II. Browns (r), Delavan (rrr).

Family HYDRODICTYACEAE
Genus PEDIASTRUM Meyen 1829

PEDIASTRUM SIMPLEX var. DUODENARIUM (Bailey) Rabenhorst.

Flora Eur. Algarum 3: 72. 1868.

Monactinus duodenarius Bailey, Smithsonian Cont. to Knowl. 7: Art. 3; 14. pl. 1, fig. 37. 1855.

Monactinus octonarius Baley, *ibid.*: 14. pl. 1, f. 36.

Pediastrum enoplon W. & G. S. West, Trans. Linn. Soc. Bot. 2nd. Ser. 5: 81. pl. 5, figs. 1-2. 1895.

Pediastrum clathratum var. *asperum* Lemmermann, Zeits. f. Fischeri u. d. Hilfsw. 1897: 180; Forschungsbr. a. d. Biol. Stat. zu Plön 7: 114, pl. 2, f. 26.

Pediastrum clathratum var. *punctatum* Lemmermann, Zeits. f. Fischeri u. d. Hilfsw. 1897: 182. f. 5.

Pediastrum simplex var. *radians* Lemmermann, Forschungsbr. a. d. Biol. Stat. zu Plön 7: 114. pl. 2, figs. 24-25. 1899.

Pediastrum clathratum var. *microporum* Lemmermann, Forschungsbr. a. d. Biol. Stat. zu Plön 7: 114, pl. 2, figs. 29-31. 1899.

Pediastrum clathratum var. *Baileyanum* Lemmermann, Forschungsbr. a. d. Biol. Stat. zu Plön 7: 115, Pl. 2 figs. 26-28. 1899.

Pediastrum simplex var. *clathratum* Chodat, Matér. p. 1. fl. crypt. Suisse 1²: 225. figs. 149A-149D. 1902.

Pediastrum simplex var. *annulatum* Chodat, *ibid.* 225. fig. 149B.

Pediastrum clathratum var. *major* Schmidle, Bot. Jahrb. f. Syst. Pflanzengesch. u. Pflanzengeogr. 32: 84. pl. 3, f. 17. 1903.

The nomenclature of the species of *Pediastrum* with single spines is in almost hopeless confusion. West (Journ. Linn. Soc. Bot. 38: 135. 1907) states that "it is impossible to recognize more than one species, and for the specific name I have retained Meyen's old name *Pediastrum simplex*." Lemmermann (Hedwigia 48: 131. 1909) takes exception to West's statement and holds that according to this reasoning the forms with two projections on the cell should all be grouped in one collective species. He recognizes four species *P. simplex* (Meyen) Lemmermann

emend., *P. clathratum* (Schröt) Lemm., *P. Sturmii* Reinsch, and *P. ovatum* (Ehrenb.) A. Br.

One horned forms were sufficiently common in the plankton catch from Vermilion lake to afford ample material for studying the range of variation. The typical *P. simplex* cells have concave sides and no, or very small, intercellular spaces between them. I have never observed this condition in any of the Wisconsin material, the intercellular spaces always being as large as the cells. This form is commonly called *P. clathratum* (Schröt.) Lemmermann, but since it differs from the typical *P. simplex* in the same manner that the varieties *clathratum* and *reticulatum* differ from *P. duplex* Meyen there is no reason for considering it a distinct species. Bailey's figures of *Monactinus duodenarius* is so clear cut that there is no doubt but that *P. clathratum* is identical with it.

The punctation or granulation of the wall is so variable that it cannot be used for distinguishing varieties; while those varieties based upon arrangement of the interior cells of the coenobite are also worthless. (Plate 13, figs. 1-5).

II. Camp (rr), Mary (rrr), Silver (rr).

III. Bear (r), Rice (r), Vermilion (cc).

PEDIASTRUM BORYANUM (Turp.) Menegh.

Linnaea 14: 210. 1840; G. S. West, Brit. Freshw. Algae 211. figs. 85F-85H. 1904.

II. Browns (rr), Camp (s), Center (s), Eagle (sss), Elizabeth (ss), Green (rrr), Hooker (rr), Mary (ss), Mill (rrr), Paddock (rrr), Silver (r).

III. Bear (ss), Beaverdam (ss), Chetac (rrr), Chetek (rrr), Granite (rrr), Grindstone (rr), Horseshoe (ss), Lac Court Oreilles (rr), Owen (r), Prairie (rrr), Pokegama (rrr), Reserve (rr), Rice (rr), Vermilion (rr), Whitefish (rr).

PEDIASTRUM GLANDULIFERUM Bennett.

Jour. Roy. Micr. Soc. 1892: 7. pl. 2, figs. 5-7. 1892.

III. Horseshoe (rrr).

PEDIASTRUM ARANEOSUM (Racib.) G. M. Smith.

Bull. Torr. Bot. Cl. 43: 476. 1916.

III. Horseshoe (rr).

PEDIASTRUM DUPLEX Meyen.

Nova acta Phys. Med. Ac. Caes.-Leop. Nat.-Cur. 14²: 772. *pl.* 43, *figs.* 6-8. 1829.

II. Browns (rr), Center (r), Eagle (r).

var. CLATHRATUM (A. Br.) Lagerheim.

Öfvers. Kgl. Vet. Ak. Förh. 39: No. 2: 56. 1882.

II. Camp (s), Mary (r).

III. Bear (rr), Beaverdam (sss), Chetek (s), Rice (ss).

var. RETICULATUM Lagerheim.

Öfvers. Kgl. Vet.-Ak. Förh. 39: No. 2: 56. *pl.* 2, *f.* 1. 1882.

II. Camp (s), Center (s), Hooker (rr), Paddock (rr).

III. Chetek (s), Island (sss), Little Rice (ss), Pokegama ss, Prairie (ss), Rice (s), Reserve (rr), Whitefish (rr).

var. ROTUNDATUM Lucks.

Jahrb. d. Westpr. Lehrervereins f. Naturkde 2: 31. 1907.

III. Horseshoe (rr).

PEDIASTRUM BIRADIATUM Meyen.

Nova Acta Ac. Caes.-Leop. Nat.-Cur. 14²: 775. *pl.* 43, *figs.* 21-22. 1829.
Lagerheim, Öfvers. Kgl. Vet.-Ak. Förh. 39: No. 2: 53. *pl.* 2, *figs.* 2-7,9,11. 1882.

The few colonies observed were of the same irregular type that Lagerheim has figured.

III. Bear (rr).

PEDIASTRUM TETRAS (Ehr.) Ralfs.

Ann. & Mag. of Nat. Hist. 14: 469. *pl.* 12, *f.* 4. 1844.

II. Browns (rr).

II. Beaverdam (rrr), Chetek (rr).

Order **ULOTRICHALES**

Family **APHANOCHAETACEAE**

Genus **APHANOCHAETE** A. Br. 1851.

APHANOCHAETE VERMICULOIDES Wolle (Plate 5, fig. 1).

Freshw. algae of U. S. 119. *pl.* 105, *figs.* 9-10. 1887.

Herpoteiron hyalothecae Hansgirg, Sitzbr. d. k. böhm. Ges. d. Wiss. Prag. 1891: 309. 1891.

III. Beaverdam (rr).

Order CONJUGALES

Family DESMIDIACEAE.

Genus NETRIUM Nägeli 1849; Lütkem. emend. 1902.

NETRIUM DIGITUS (Ehr.) Itzigs. u. Rothe.

In Rabenhorst, Algen No. 508. 1856. W. & G. S. West, Monogr. of Brit. Desm. 1: 64. pl. 6, figs. 14-16. 1904.

I. Squirrel (rrr).

Genus CLOSTERIUM Nitzsch 1817.

CLOSTERIUM ACICULARE var. SUBPRONUM (W. West) W. & G. S. West.

Monogr. of Brit. Desm 1: 175. pl. 23, figs. 4-5. 1904.

Closterium subpronum var. *lacustre* Lemmermann, Abh. Natw. Ver. Bremen 16: 344. pl. 1, figs. 13-14. 1899.

The dimensions of the cells are those of *C. subpronum* var. *lacustre* Lemmermann but since the Wests state that "*Closterium subpronum* var. *lacustre* should be relegated to this variety although the dimensions are a little larger," I have followed their practice.

I. Green (r).

Genus MICRASTERIAS C. A. Agardh 1827.

MICRASTERIAS PINNATIFIDA (Ktz.) Ralfs.

Brit. Desm. 77. pl. 10, figs 3a-3b. 1848.

I. Kawaguesaga (rrr).

MICRASTERIAS TRUNCATA (Corda) de Bréb.

In Ralfs, Brit. Desm. 75. pl. 8, fig. 4; pl. 10, fig. 5. 1848.

I. Soft (sss).

III. Beaverdam (rr), Chetek (rrr).

MICRASTERIAS SOL (Ehr.) Kützing.

Species algarum 171. 1849; W. & G. S. West, Monogr. of Brit. Desm. 2: 95. pl. 46, figs. 1-2. 1905.

Micrasterias radiosa Ralfs non C. A. Agardh. Ralfs. Brit. Desm. 72. pl. 8, fig. 3. 1848.

III. Beaverdam (rr).

MICRASTERIAS RADIATA Hassall.

Hist. Brit. Freshw. Algae 386. *pl.* 90, *f.* 2. 1845; W. & G. S. West, Monogr. of Brit. Desm. 2: 113. *pl.* 52, *figs.* 1-9. 1905.

Micrasterias furcata Ralfs non C. A. Agardh. Ralfs, Brit. Desm. 73. *pl.* 9, *f.* 2. 1848.

I. Kawaguesaga (rrr).

III. Beaverdam (rrr), Horseshoe (rrr).

MICRASTERIAS AMERICANA (Ehr.) Ralfs.

Brit. Desm. p. XIX. 1848.

Micrasterias morsa Ralfs, Brit. Desm. 74. *pl.* 10, *f.* 1. 1848.

I. Found (rr).

III. Horseshoe (rrr).

Genus COSMARIUM Corda 1834.

COSMARIUM CONTRACTUM Kirchner.

Algen I, in Cohn, Kryptogamenfl. Schlesien 2: 147. 1878; Wille, Christiana Vid.-Selsk. Förh. 1880: No. 11: p. 33. *pl.* 1, *f.* 19. 1880.

III. Horseshoe (rr), Shell (s).

var. JACOBSENII (Roy) W. & G. S. West.

Monogr. of Brit. Desm. 2: 171. *pl.* 61, *f.* 26. 1905.

I. Mendota (rr).

COSMARIUM MONILIFORME var. LIMNETICUM W. & G. S. West.

Monogr. of Brit. Desm. 3: 23. *pl.* 67, *figs.* 6-7. 1908.

III. Lac Court Oreilles (rr).

COSMARIUM BOTRYTIS (Bory de St. Vincent) Menegh.

Linnaea 14: 220. 1840; Ralfs, Brit. Desm. 99. *pl.* 16, *f.* 1. 1848.

III. Number One (rrr).

COSMARIUM PROTRACTUM (Nägeli) de Bary.

Unters. u. d. Fam. d. Conj. 72. 1858.

Euastrum protractum Nägeli, Gatt. einz. Algen 119. *pl.* 7, *fig.* A⁴. 1849.

I. Okauchee (rrr).

Genus XANTHIDIUM Ehrenberg 1834.

XANTHIDIUM SUBHASTIFERUM W. West.

Jour. Linn. Soc. Bot. 29: 166. *pl.* 22, *f.* 4. 1892.

I. Birch (ss), Catherine (rr), Catfish (sss), Cranberry (sss), Kawaguesaga (rr), No Mans (ss), Rock (r), Sishebogema (rr), Squirrel (rr), Tamarack (rr), North Turtle (rr).

III. Bear (rr), Beaverdam (s), Horseshoe (s), Shell (cc).

XANTHIDIUM ANTILOPAEUM var. DEPAUPERATUM W. & G. S. West.

Trans. & Proc. Bot. Soc. Edinburgh 23: 23. *pl.* 1, *figs.* 15-16. 1905.

I. Otter (rr).

XANTHIDIUM ANTILOPAEUM var. POLYMAZUM Nordstedt.

Acta Univ. Lunds 9: 38. *pl.* 1, *f.* 20. 1873.

I. Cranberry (rrr), Found (rr), George (rr).

III. Beaverdam (ss), Horseshoe (rr).

XANTHIDIUM CRISTATUM var. LEIODERMUM (Roy & Biss.) Turner.

Kgl. Sv. Vet.-Ak. Handl. 25: No. 5: 99. *pl.* 12, *f.* 33. 1892.

III. Chetek (rrr), Island (rrr).

Genus ARTHRODESMUS Ehrenberg 1838.

ARTHRODESMUS INCUS var. RALFSII forma LATIUSCULA W. & G. S. West.

Monogr. of Brit. Desm. 4: 96. *pl.* 114, *f.* 5. 1912.

II. George (rr), Pardee (rr).

III. Dummy (rrr), Horseshoe (rr).

ARTHRODESMUS TRIANGULARIS Lagerheim.

Öfvers. Kgl. Vet.-Ak. Förh. 42: No. 7: 244. *pl.* 27, *f.* 22. 1885.

III. Dummy (rr).

var. INFLATUS W. & G. S. West.

Jour. Linn. Soc. Bot. 33: 320. 1898; Monogr. of Brit. Desm. 4: 99. *pl.* 114, *figs.* 14-15. 1912.

III. Horseshoe (rr).

var. INFLATUS forma ROBUSTA W. & G. S. West.

Monogr. of Brit. Desm. 4: 99. *pl.* 114, *f.* 16. 1912.

III. Shell (rr).

ARTHRODESMUS QUIRIFERUS W. & G. S. West.

Jour. Linn. Soc. Bot. 35: 542. *pl.* 17, *figs.* 9-10. 1903.

I. Speese (rr), Squirrel (rr).

ARTHRODESMUS SUBULATUS Kützing.

Species algarum 176. 1849; W. & G. S. West, Trans. Linn. Soc. Bot. 2nd. Ser. 5: 72. *pl.* 9, *figs.* 32-33. 1895.

II. George (rr), Meta (rr).

Genus STAURASTRUM Meyen 1829.

STAURASTRUM DICKIEI Ralfs.

Brit. Desm. 123. *pl.* 21. *f.* 3. 1848.

III. Beaverdam (rrr).

STAURASTRUM MEGACANTHUM Lundell.

Nova acta r. soc. sci. Upsaliensis. 3. Ser. 8: 61. *pl.* 4, *f.* 1. 1871.

I. South Turtle (rr).

III. Lac Court Oreilles (ss), Reservé (sss), Whitefish (cc).

var. SCOTICUM W. & G. S. West .

Jour. Linn. Soc. Bot. 35: 544. *pl.* 16, *f.* 8. 1903.

III. Horseshoe (rr), Shell (c).

STAURASTRUM ORBICULARE (Ehrenb.) Menegh.

Linnaea 14: 225. 1840.

III. Beaverdam (rrr).

STAURASTRUM MUCRONATUM var. DEBARYANUM (Nordst.) Turner.

Kgl. Sv. Vet.-Ak. Handl. 25: no. 5: 105. *pl.* 16, *f.* 20. 1892.

III. Silver (rr), Whitefish (rr).

STAURASTRUM PILOSUM (Nägeli) Archer.

In Pritchard, Infusoria. 4th. Ed. 739. 1861; Cleve, Öfvers. Kgl. Sv. Vet.-Ak. Förh. 20: No. 10: 490. *pl.* 4, *f.* 3. 1863

III. Dummy (rrr).

STAURASTRUM DENTICULATUM (Nägeli) Archer.

In Pritchard, Infusoria. 4th. Ed. 738. 1861; W. & G. S. West, Trans. R. Ir. Acad. 33: Sec. B. 103. *pl.* 11, *f.* 11. 1906.

III. Bear (r), Beaverdam (rr), Duck (r), Granite (rrr), Horseshoe (rr), Lac Court Oreilles (ss), Shell (ss), Whitefish (rr).

STAUSTRUM BRACHIATUM Ralfs.

Brit. Desm. 131. *pl.* 23, *f.* 9. 1848.

III. Dummy (s).

STAUSTRUM PARADOXUM Meyen.

Nova Acta. Phys.-med. Ac. Caes.-Leop. Nat.-Cur. 14²: 777. *pl.* 43, *figs.* 37-38. 1829; W. & G. S. West, Jour. Linn. Soc. Bot. 35: 548: *pl.* 18, *f.* 5. 1903.

III. Shell (sss).

var. LONGIPES Nordstedt.

Acta. Univ. Lunds 9: 35. *pl.* 1, *f.* 17. 1873; W. & G. S. West Trans. R. Soc. Edinburgh 41: 504. *pl.* 7, *figs.* 13-14. 1905.

I. Devils (sss), Fowler (rr), Lac la Belle (rrr).

II. Center (sss), Hooker (rr).

III. Chetek (rr), Dummy (r), Granite (ss), Whitefish (ss).

STAUSTRUM MANFELDTHI var. ANNULATUM W. & G. S. West.

Trans. R. Irish. Acad. 32: Sec. B: 56. *pl.* 1, *figs.* 30-31. 1902.

III. Dummy (rr).

STAUSTRUM GRACILE var. BULBOSUM W. West.

Jour. Linn. Soc. Bot. 29: 182. *pl.* 23, *f.* 11. 1892.

III. Duck (s), Dummy (ss).

STAUSTRUM LEPTOCLADUM var. CORNUTUM Wille.

Bih. t. Kgl. Sv.-Vet. Ak. Handl. 8: No. 18: 19. *pl.* 1, *f.* 39. 1884.

III. Horseshoe (ss).

STAUSTRUM LEPTOCLADIUM var. DIVERGENS Wolle.

Desm. U. S. 1st. Ed. 136. *pl.* 44, *f.* 5. 1884.

III. Lac Court Oreilles (r), Whitefish (sss).

STAUSTRUM OPHIURA Lundell.

Nova acta r. soc. sci. Upsaliensis, 3, Ser. 8: 69. *pl.* 4, *f.* 7. 1871.

III. Horseshoe (rrr).

STAUSTRUM ARACHNOIDES W. West.

Jour. Linn. Soc. Bot. 29: 186. *pl.* 24, *f.* 4. 1892.

III. Devils (rr), Horseshoe (rr).

STAURASTRUM FUCIGERUM de Bréb.

In Meneghini, *Linnaea* 14: 226. 1840.

Didymocladon fucigerus (de Bréb) Ralfs. *Brit. Desm.* 144. *pl.* 33, *f.* 12. 1848.

III. Duck (c), Granite (rr).

STAURASTRUM LEPTACANTHUM Nordstedt.

Vidensk. Medd. d. naturh. Foren. i. Kjobenhavn. 1869: 229. *pl.* 4, *f.* 46. 1870.

III. Dummy (rr), Horseshoe (rr).

STAURASTRUM ARCTISCON, (Ehr.) Lundell.

Nova acta r. soc. sci. Upsaliensis, 3, Ser. 8: 70. *pl.* 4, *f.* 8. 1871.

III. Silver (rrr).

var. GLABRUM W. & G. S. West.

Trans. Linn. Soc. Bot. 2, Ser. 5: 269. *pl.* 18, *f.* 14. 1896.

I. Devils (rrr), Muskallonge (rr), Soft (cc).

Genus COSMOCLADIUM de Bréb. 1856.

COSMOCLADIUM SAXONICUM de Bary.

Flora 48: 321. *pl.* 4, *figs.* 1-3. 1865.

I. Devils (ccc), Squirrel (rr), North Turtle (sss).

III. Beaverdam (rr).

Genus SPHAEROSOMA Corda 1835.

SPHAEROSOMA PULCHRUM Bailey.

In Ralfs, *Brit. Desm.* 209. *pl.* 35, *f.* 2. 1848.

I. Nell (rr).

SPHAEROSOMA AUBERTIANUM W. West.

Jour. of Bot. 27: 206. *pl.* 291, *f.* 17. 1889; W. & G. S. West, *Trans. R. Soc.*

Edinburgh 41: 505. *pl.* 6, *f.* 7. 1905.

I. Devils (rr), Razorbaek (rrr).

Genus SPONDYLOSIUM de Bréb.

SPONDYLOSIUM PLANUM (Wolle) W. & G. S. West.

Jour. Linn. Soc. Bot. 40: 430. *pl.* 19, *figs.* 5-8. 1912.

- I. Catfish (rr), Cranberry (rr), Devils (r), Found (r), Rock (rrr).
III. Beaverdam (rr), Horseshoe (rr), Lac Court Oreilles (r), Reserve (r),
Shell (s), Whitefish (rr).

SPONDYLOSIUM PAPILLOSUM W. & G. S. West.

Trans. Linn. Soc. Bot. 2 Ser. 5: 43. *pl.* 9, *f.* 19. 1895.

- III. Devils (rr).

SPONDYLOSIUM MONILIFORME Lundell.

Nova acta r. soc. sci. Upsaliensis 3 Ser. 8: 92. *pl.* 5, *f.* 16. 1871.

- III. Beaverdam (rr).

Genus ONYCHONEMA Wallich 1860.

ONYCHONEMA LAEVE var. MICRACANTHUM Nordstedt.

Acta. Univ. Lunds 16: 3. 1880; Johnson, Bull. Torr. Bot. Cl. 21: 286. *pl.*
211, *f.* 15. 1894.

- I. Devils (sss), Soft (rrr).
III. Beaverdam (rrr), Devils (rr).

Genus HYALOTHECA Ehrenberg 1841.

HYALOTHECA DISSILIENS (Smith) de Bréb.

In Ralfs, Brit. Desm. 51. *pl.* 1, *f.* 1. 1848.

- III. Beaverdam (r), Duck (rr).

Genus DESMIDIUM C. A. Agardh 1824.

DESMIDIUM CYLINDRICUM Greville.

Scott. Crypt. Fl. 5: 293. *pl.* 293, *figs.* 1-3. 1827; Wolle, Desm. U. S. 1st.
Ed. 25. *pl.* 3, *figs.* 1-4. 1884.

- I. No Mans (rrr).

DESMIDIUM SWARTZII C. A. Agardh.

Systema algarum 9. 1824; Ralfs, Brit. Desm. 61. *pl.* 4, *figs.* A-F. 1848.

- I. Found (rr).
III. Beaverdam (rr), Lac Court Oreilles (rrr).

DESMIDIUM BAILEYI Nordstedt.

Acta univ. Lunds 16: 4. 1880; Kgl. Sv. Vet.-Ak. Handl. 22: No. 8: 27.
pl. 2, figs. 4-5. 1888.

I. Found (r).

Class HETEROKONTAE.

Order Heterococcales

Family BOTRYOCOCCACEAE

Genus BOTRYOCOCCUS Kützing 1849.

BOTRYOCOCCUS BRAUNII Kützing.

Species algarum 892. 1849; Fresenius, Abh. Senckenb. Naturf. Ges. 2:
239. pl. 11, figs. 27-33. 1858.

The identity of the organism that Kützing named *B. Braunii* has been a matter of considerable discussion. Fresenius' account is of particular interest since he compared his material with material sent him by Braun from the original station (Neuenberger Lake). His figures, although small, are quite characteristic.

This alga was listed as *Ineffigiata neglecta* W. & G. S. West in the preliminary list, the *B. Braunii* of that list being *B. sudeticus* Lemmermann.

- I. Beaver (rr).
II. Browns (ss), Camp (rrr), Center (s), Delevan (rrr), Elizabeth (rr),
Green (rrr), Mary (sss), Mill (ss), Paddock (r), Silver (r).
III. Bear (rr), Beaverdam (ss), Birch (rr), Chetae (rr), Devils (rr),
Grindstone (r), Horseshoe (rr), Lac Court Oreilles (sss), Little
Rice (rr), Reserve (rr), Rice (rr), Shell (rr), Whitefish (rrr).

Botryococcus protruberans var. *minor* var. nov.

Cells half the size of the typical form. Length 8-9.5 μ ,
greatest breadth 5-6.5 (Plate 14, figs. 6-7).

The typical form of this particular species was described from preserved material and the Wests were unable to determine the nature of the chloroplast. I have collected it in abundance from one lake and find that the chloroplast is distinctly parietal and occupies the greater portion of the wall in certain cases.

The characteristic occurrence of small aggregates of four and eight cells, which forms the chief distinction between this and the other species of the genus, was also noted. Although I have observed many thousand colonies I have never noted the characteristic change to a yellowish color that the Wests describe.

I. George (a), Pardee (rr).

Family CHLOROBOTRYDACEAE
Genus CHLOROBOTRYS Bohlin 1901.

Chlorobotrys limneticus sp. nov.

Cells ovoid, irregularly distributed within a homogeneous, hyaline, gelatinous integument. 10-80 cells in each colony. Chromoplasts disc-shaped, parietal, 3-4 in each cell, without pyrenoids, pale yellow-green. (Plate 14, fig. 10).

Length of cells 6-8 μ , width 5-6 μ . Diam. colony 40-200 μ .

The general appearance of the colony is quite similar to *Phaeococcus planctonicus* W. & G. S. West but the color of the chromoplast is the typical yellow green of the Heterokontae.

I. Camp (rr).

Explanation of Plates 10-15.

PLATE 10

- Figs. 1-2. *Gonium pectorale* Mueller, x 500.
 Figs. 3-6. *Asterococcus limneticus* G. M. Smith (Fig. 4, x 500; Figs. 3, 5, 6, x 1000).
 Fig. 7. *Kirchneriella obesa* var. *major* (Bernard) G. M. Smith, x 1000.
 Figs. 8-11. *Planktosphaeria gelatinosa* G. M. Smith, x 1000.

PLATE 11

- Fig. 1. *Ankistrodesmus lacustris* (Chodat) Ostenfeld, x 1000.
 Figs. 2-3. *Crucigenia irregularis* Wille, x 1000.
 Figs. 4-5. *Scenedesmus arcuatus* var. *capitatus* G. M. Smith, x 1000.
 Figs. 6-13. *Characium curvatum* G. M. Smith, x 1000.
 Figs. 14-18. *Characium limneticum* Lemmermann, x 1000.

PLATE 12

- Fig. 1. *Crucigenia Lauterbornei* Schmidle, x 1000.
 Figs. 2-5. *Polyedriopsis spinulosa* Schmidle, x 1000.
 Fig. 3. *Actinastrum Hantzschii* var. *elongatum* G. M. Smith, x 1000.
 Fig. 4. *Micractinium pusillum* var. *elegans* G. M. Smith, x 1000.

PLATE 13

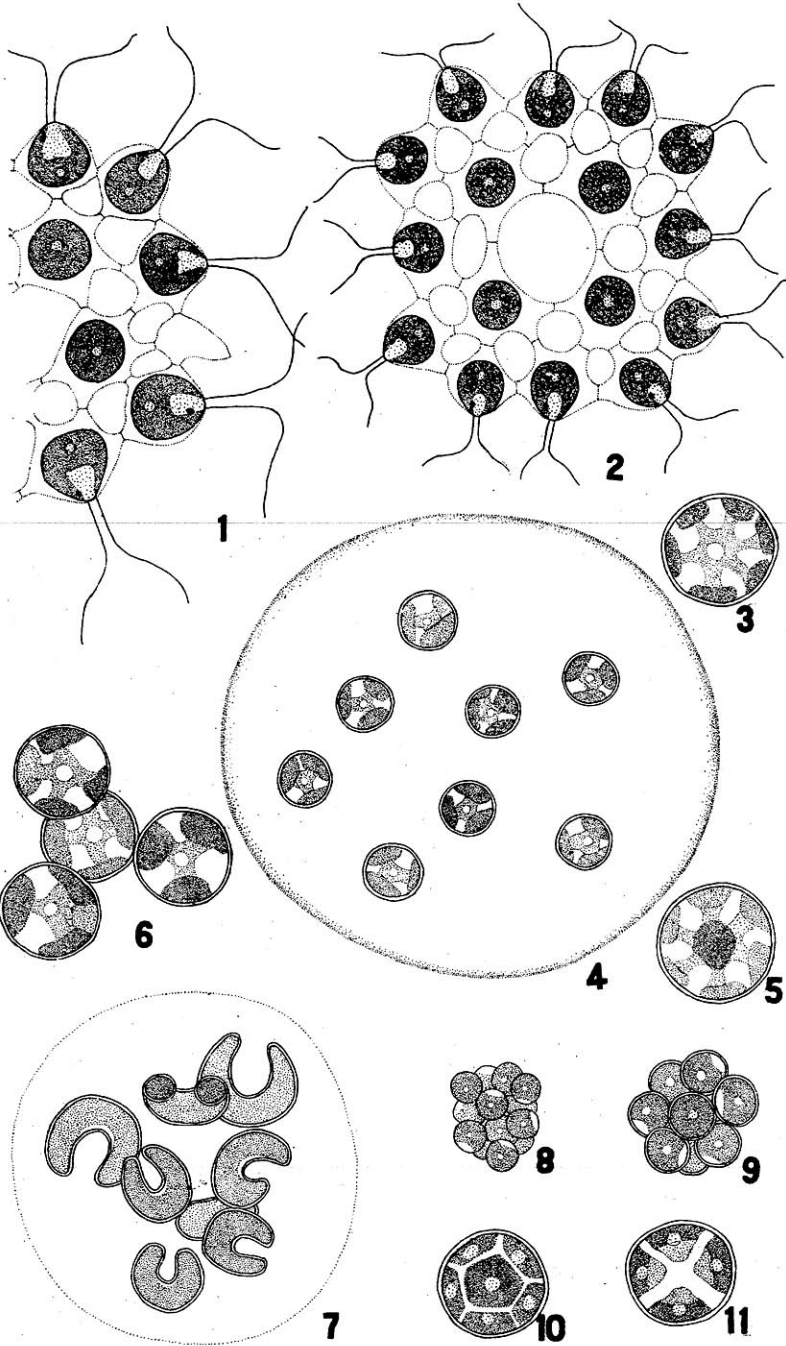
- Figs. 1-5. *Pediastrum simplex* var. *duodenarium* (Bailey) Rabenhorst, x 333.
 Figs. 6-8. *Sorastrum americanum* (Bohlin) Schmidle, x 666.
 Fig. 7. *Sorastrum americanum* var. *undulatum* G. M. Smith, x 666.

PLATE 14

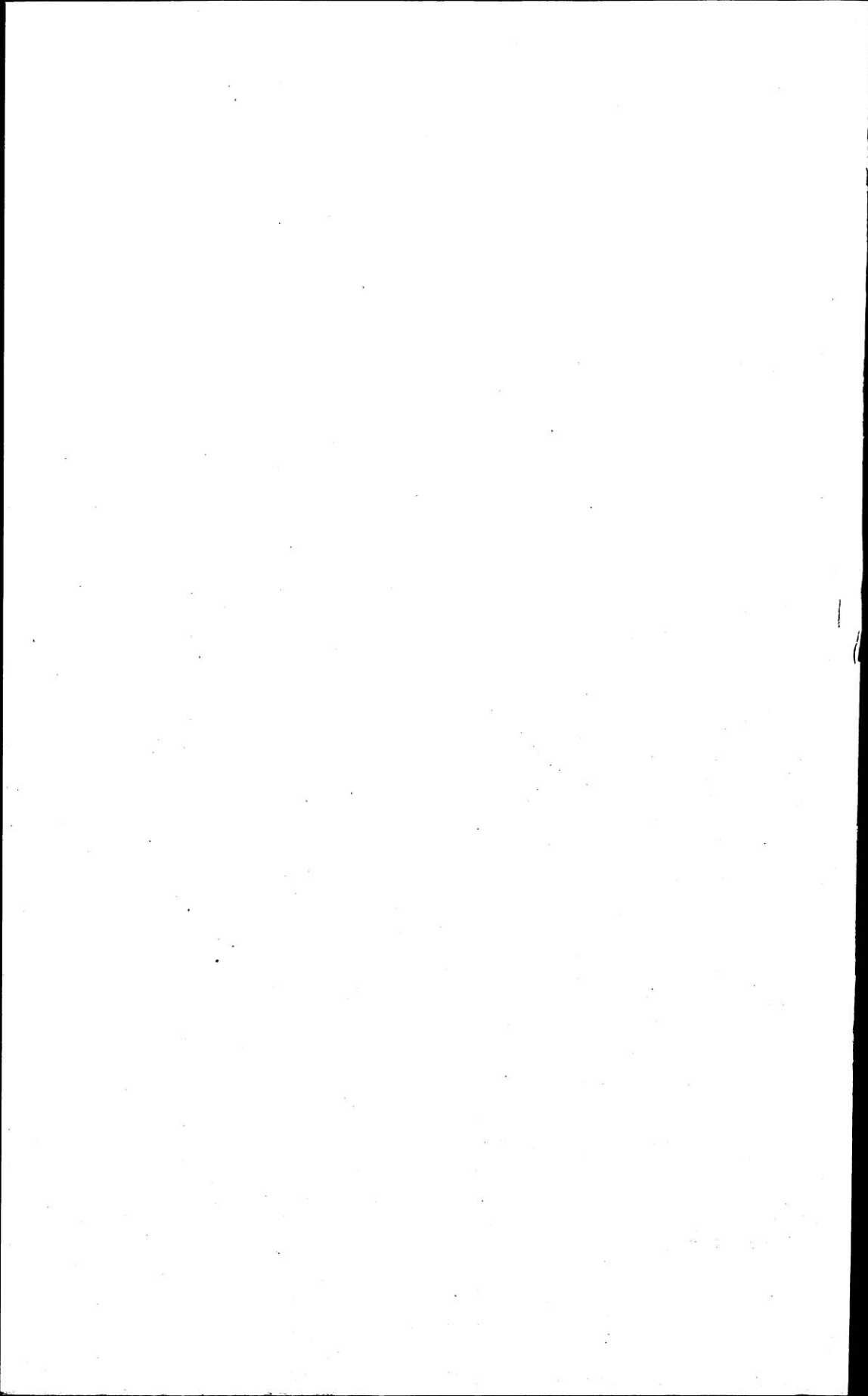
- Fig. 1. *Aphanochaete vermiculoides* Wolle, x 400.
 Figs. 2-4. *Dactylococcopsis acicularis* Lemmermann, x 1000.
 Fig. 5. *Trichodesmium lacustre* Klebahn, x 1000.
 Figs. 6-7. *Botryococcus protruberans* var. *minor* G. M. Smith, (Fig. 6 x 500, Fig. 7 x 1000).
 Figs. 8-9. *Oocystis eremosphaeria* G. M. Smith, x 1000.
 Fig. 10. *Chlorobotrys limneticus* G. M. Smith, x 1000.

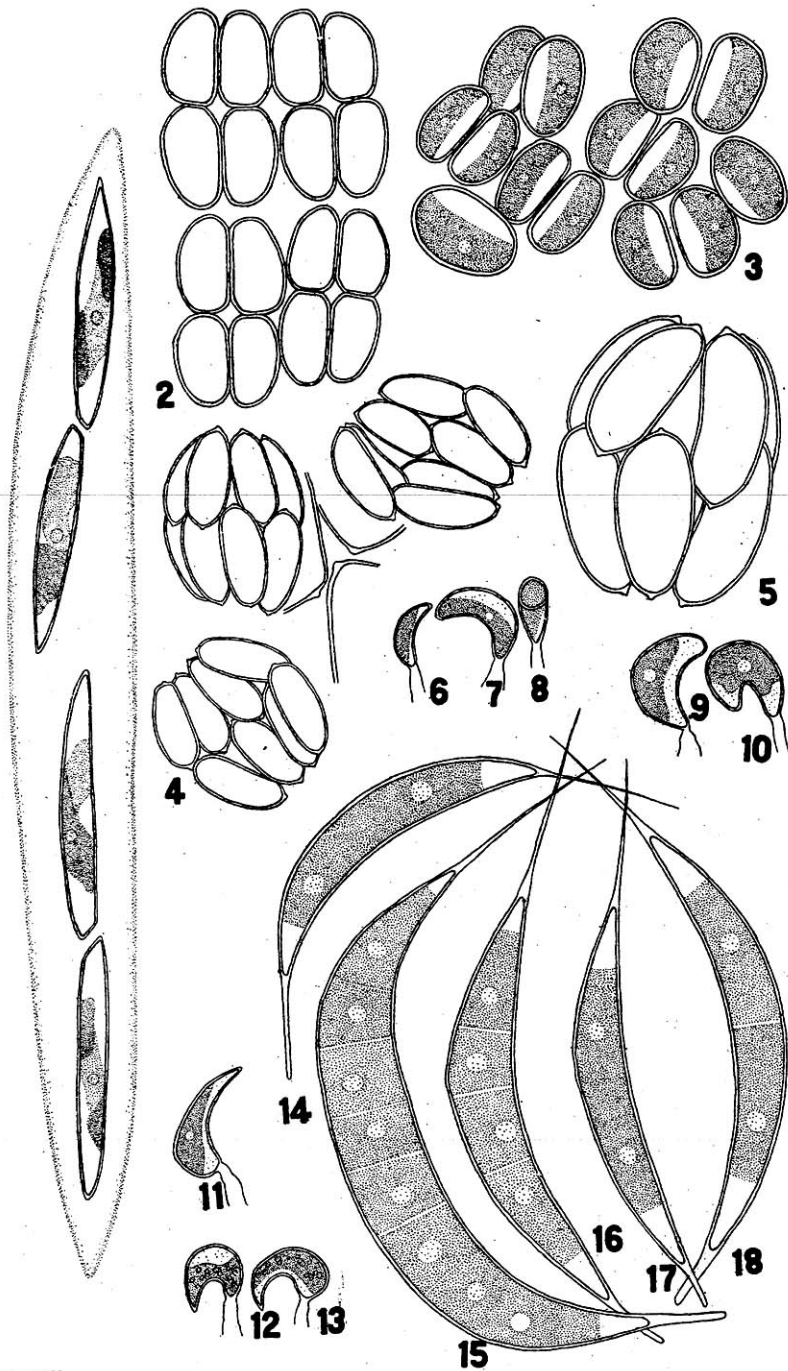
PLATE 15

- Figs. 1-2. *Tetraedron verrucosum* G. M. Smith, x 1000.
 Fig. 3. *Tetraedron gracile* (Reinsch) Hansgirg, x 1000.
 Figs. 4-5. *Tetraedron proteiforme* (Turner) Brunnthaler, x 1000.
 Figs. 6-7. *Oocystis natans* var. *major* G. M. Smith, (Fig. 6 x 500, fig. 7 x 1000).

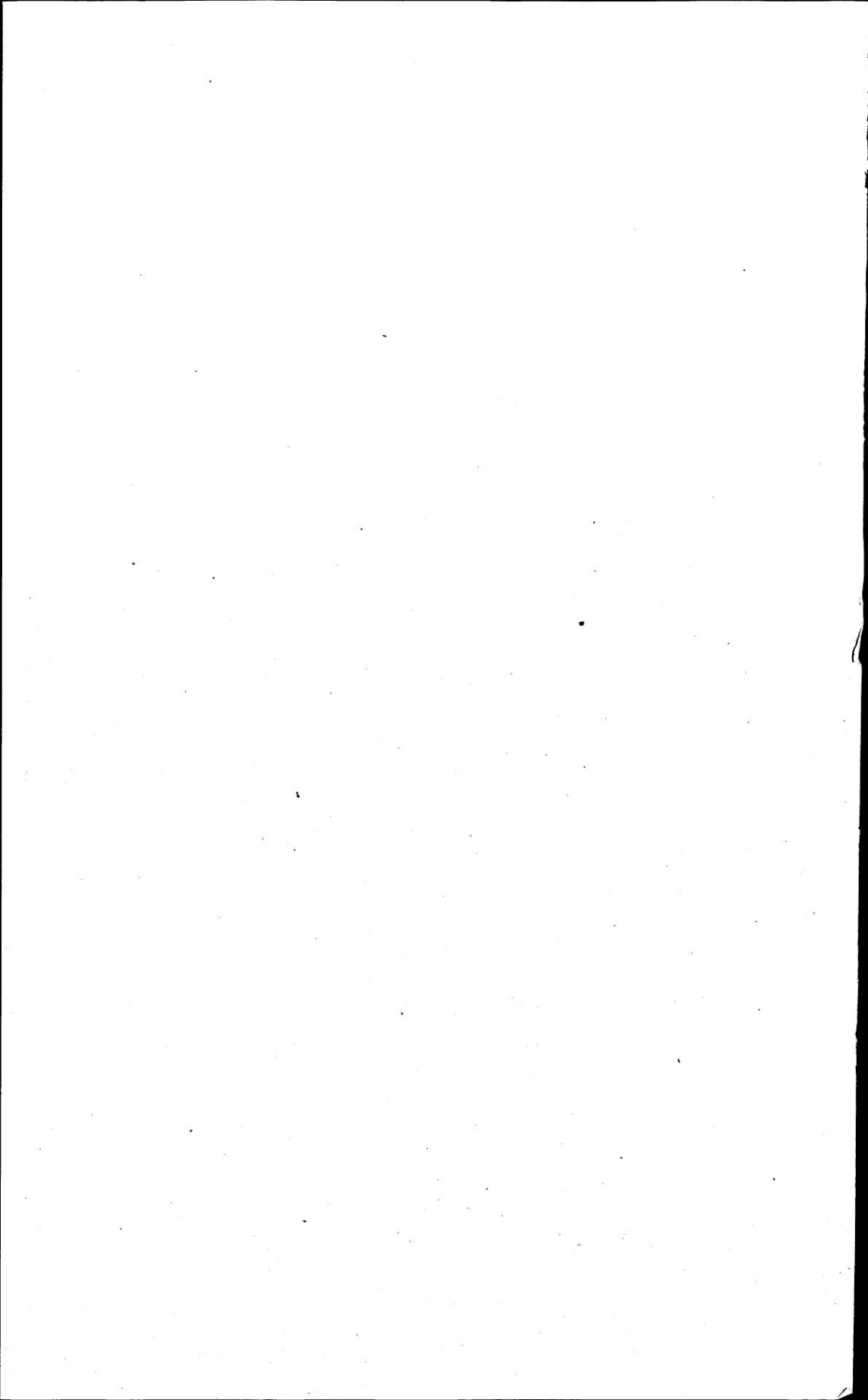


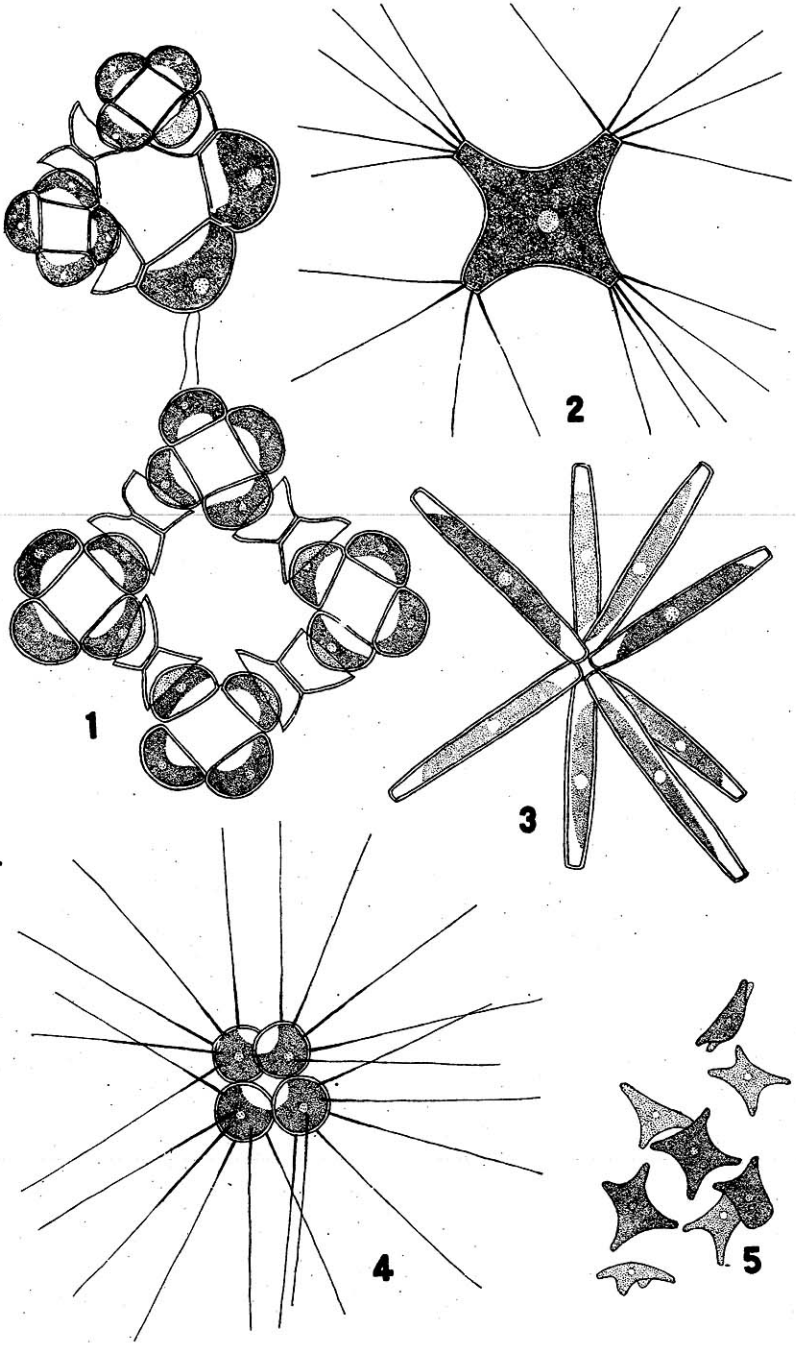
SMITH—ALGAE .



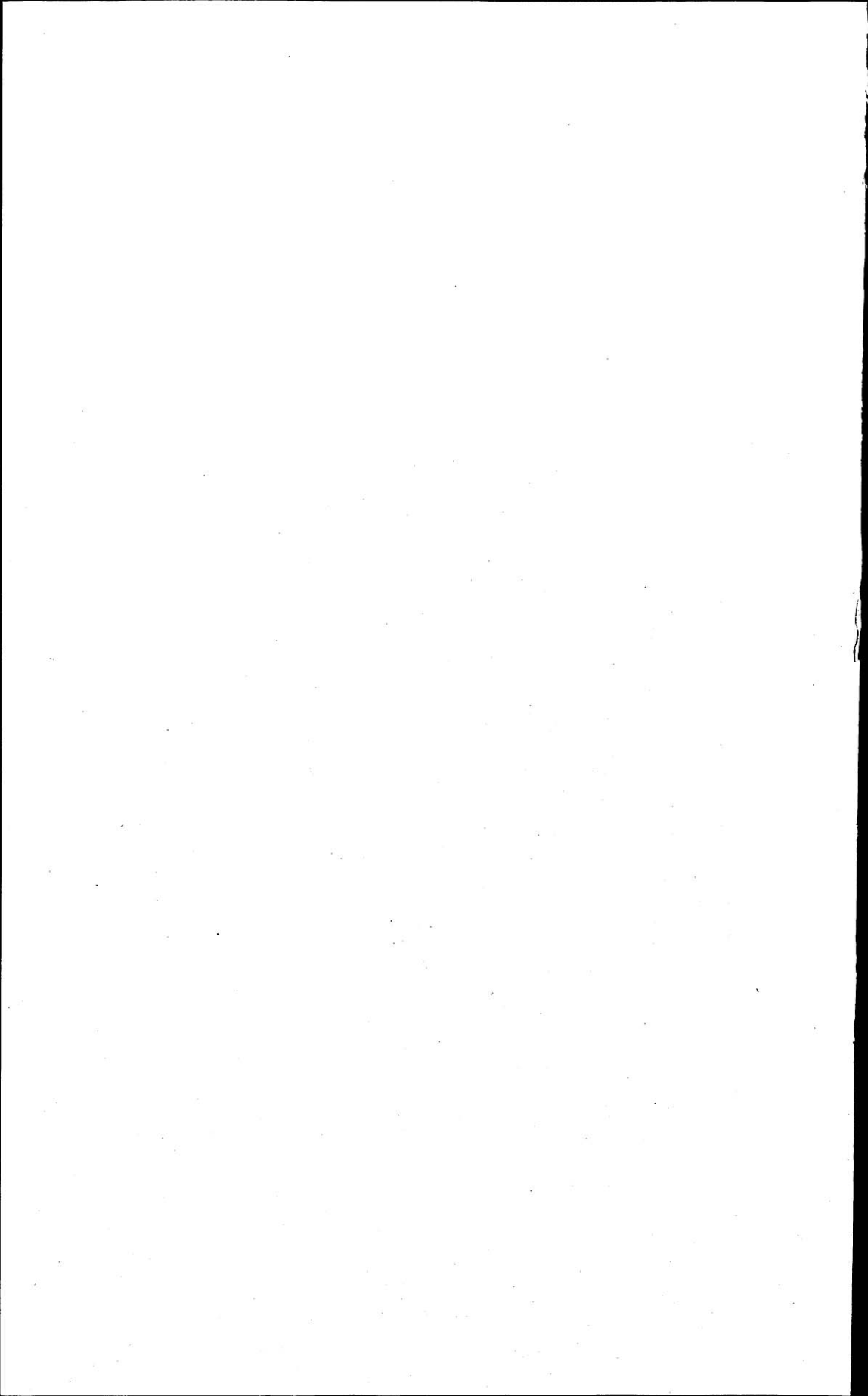


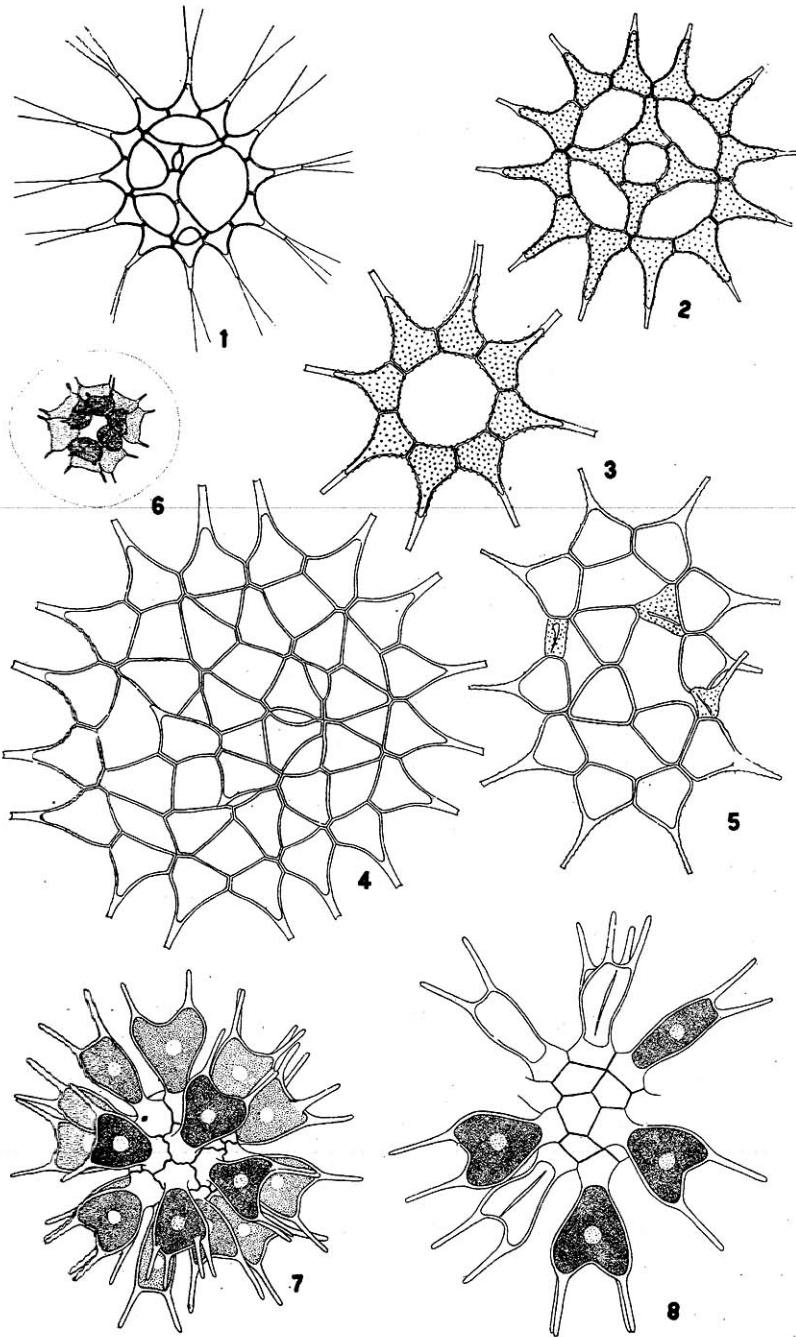
SMITH—ALGAE

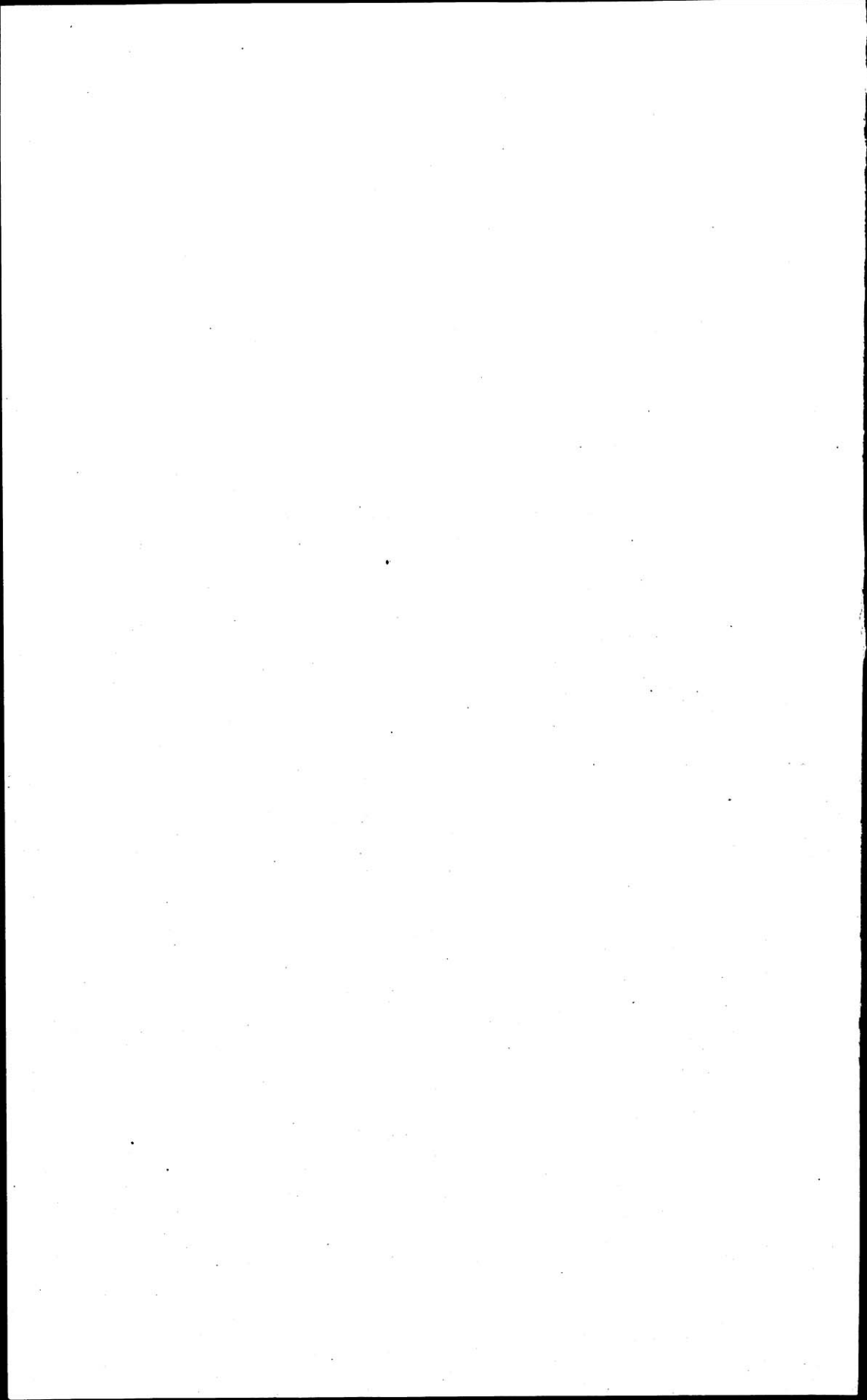


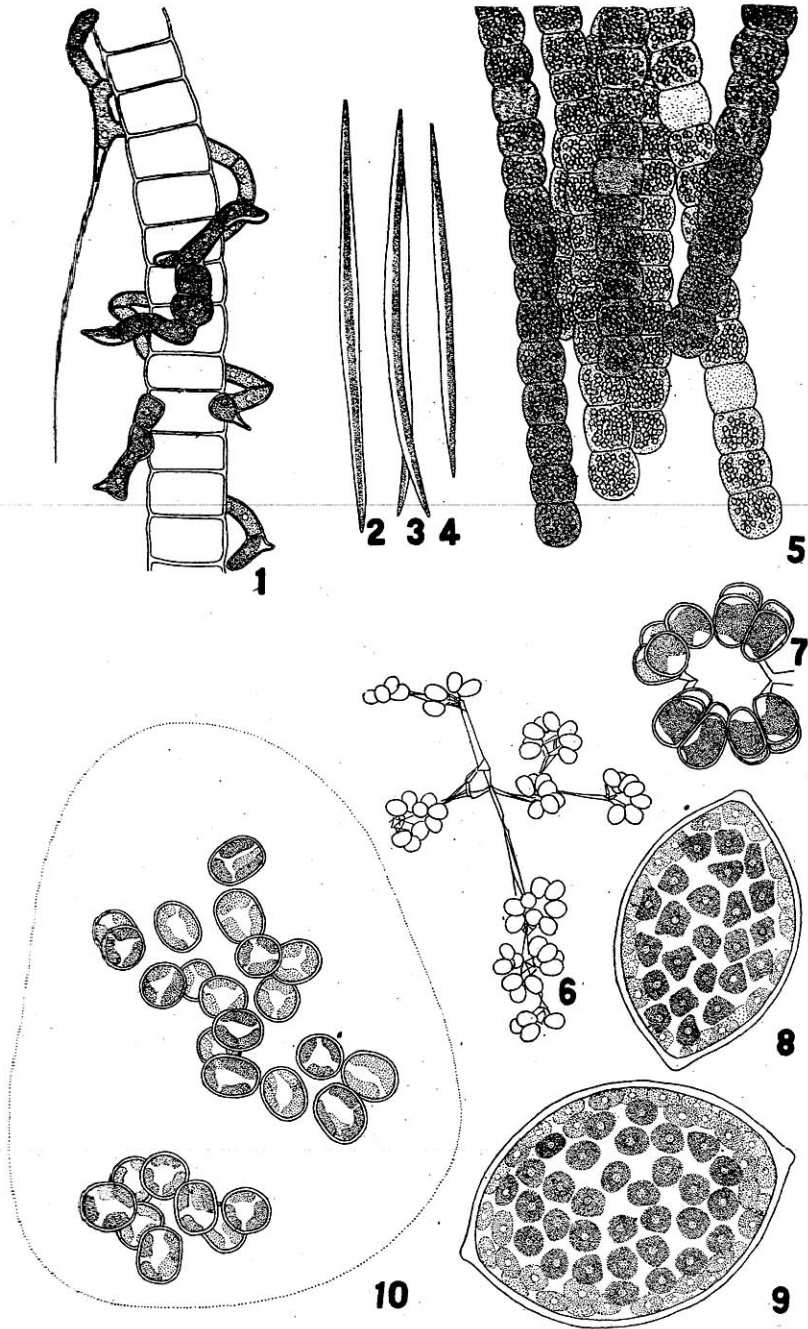


SMITH—ALGAE

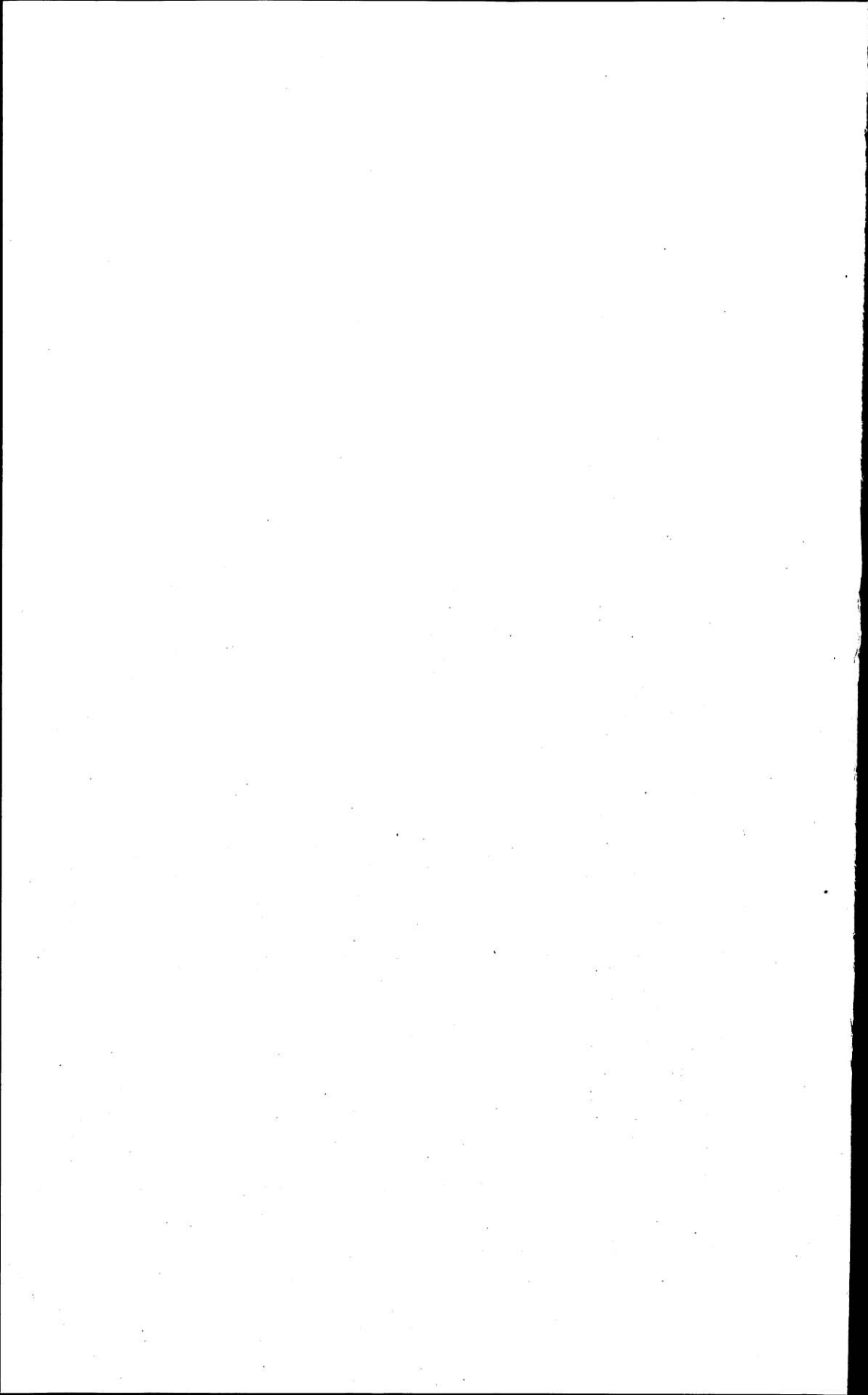


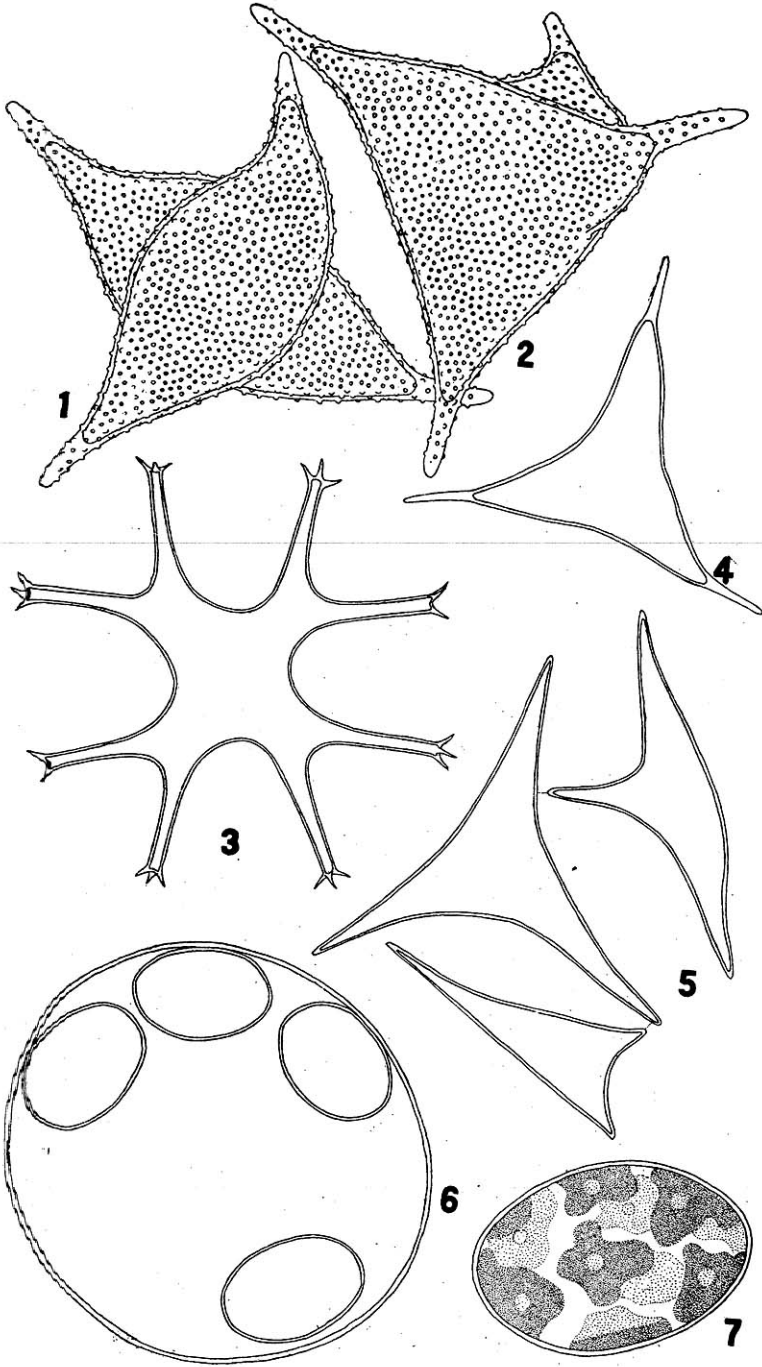






SMITH—ALGAE





SMITH—ALGAE

