FLORA HIBERNICA.

PART THIRD.

ALGÆ.

ORD. 99. ALGÆ. *Juss. (Linn. part of.)* Sea-weed Family.

Cellular plants, growing with very few exceptions in water; very variable in form, texture, colour, and in the organs of fructification.—*Plant* either a single cellule, or a number of cellules united by their extremities into series, and thus forming simple or branched *filaments*; or by lateral as well as terminal cohesion extended into *membranes*, which often assume a foliaceous character; or formed into cylindrical fronds.—*Texture* either gelatinous, membranaceous, cartilaginous, coriaceous, ligneous or horny.—*Colour* varying through every shade of red, green, olive, brown, &c.—*Fructification: granules* in various states of perfection or arrangement, either dispersed over the whole plant, or collected into little groups *(sori)*; or contained in distinct gelatinous receptacles, or membranaceous capsules, or forming moniliform filaments.

SYNOPSIS OF THE FAMILIES AND GENERA.

DIV. I.—MELANOSPERMEÆ. *Plants marine, foliaceous, strap-shaped, or filamentous, of an olive-brown or olive-green colour. Fructification contained in definite capsules or receptacles, or in distinct sori.*

TRIBE I. FUCOIDEÆ. *Plants coriaceous, robust, much branched or leafy, mostly bearing vesicles; structure fibrous. Fructifi-*

cation: opaque seeds imbedded in distinct receptacles and finally escaping by superficial pores.—(None of the Irish genera have distinct leaves.)

1. CYSTOSEIRA. *Vesicles* simple, innate in the branches. *Receptacles* small. *Seeds* in distinct cells.

2. HALIDRYS. *Vesicles* stalked, lanceolate, divided by transverse septa.

3. FUCUS. *Vesicles* (when present) simple, immersed in the frond. *Receptacles* turgid, containing tubercles imbedded in mucus.

4. HIMANTHALIA. *Frond* cup-shaped. *Receptacles* (frond-like) very long, dichotomously branched, strap-shaped.

TRIBE II. LICHINEÆ. *Plants cartilaginous, flat, branched, (minute.) Fructification receptacles furnished with a terminal pore, containing pellucid seeds disposed in moniliform series.*

5. LICHINA. Character the same as the Tribe.

TRIBE III. LAMINARIEÆ. *Fronds stipitate; stipes terminating in a foliaceous cleft or entire, occasionally midribbed expansion. Fruct. obscure.*

6. ALARIA. *Frond* membranaceous, with a cartilaginous percurrent midrib.

7. LAMINARIA. *Frond* simple or cleft, destitute of distinct midrib.

TRIBE IV. SPOROCHNOIDEÆ. *Plants cartilaginous or membranaceous, much branched, inarticulate, bearing at some period of growth deciduous tufts of bright green filaments.*

8. DESMARESTIA. *Frond* plane or compressed, distichously branched, when young furnished with marginal deciduous tufts of fine green filaments, the branches set with marginal spines. *Grev.*

9. DICHLORIA. *Frond* cylindrical, filiform, cartilaginous, pinnated with opposite branches, becoming flaccid and of a verdigris green colour on exposure to the air. Fructification unknown. *Grev.*

10. SPOROCHNUS. *Frond* filiform, cylindrical, or compressed, cartilagineo-membranaceous. *Fructification:* club-shaped, moniliform filaments radiating in scattered *warts*, or concentrated in distinct (mostly clavate stalked) *receptacles*, often terminated by a deciduous tuft of filaments. *Grev.*

TRIBE V. DICTYOTEÆ. *Plants membranaceous, flat, or cylindrical, of a highly reticulated structure. Fructification opaque, seeds with pellucid cases, ranged in lines, sori, or covering the whole frond.*

* *Root minute, scutate, naked.*

11. CHORDA. *Frond* simple, filiform, cylindrical, furnished at intervals with distinct *septa.*

12. ASPEROCOCCUS. *Frond* simple, tubular, (rarely compressed.)

13. PUNCTARIA. *Frond* simple, flat, foliaceous.

14. STRIARIA. *Frond* tubular, branched; *seeds* in transverse lines.

15. DICTYOSIPHON. *Frond* tubular, branched; *seeds* scattered.

* * *Root, a mass of woolly filaments.*

16. DICTYOTA. *Frond* ribless, dichotomous or irregularly cleft. *Seeds* scattered over the frond.

17. CUTLERIA. *Frond* ribless, irregularly cleft. *Fructification:* clusters of pedicellate capsules.

18. PADINA. *Frond* flabelliform, cleft. *Seeds* ranged in concentric lines.

19. HALISERIS. *Frond* midribbed, subdichotomous. *Seeds* disposed in sori or groups, mostly arranged in longitudinal lines.

TRIBE VI. ECTOCARPEÆ. *Plants filamentous, often capillary and confervoid, articulated, much branched. Fructification double: capsules and imbedded granules.*

20. CLADOSTEPHUS. *Stem* inarticulate, branched, whorled with short articulated ramuli.

21. SPHACELARIA. *Stem* articulate, branched, distichous, pinnated, rigid.

22. ECTOCARPUS. Excessively branched, capillary, flaccid, articulated.

23. MYRIOTRICHIA. *Stem* simple, articulate, flaccid, set with short quadrifarious ramuli.

TRIBE VII. CHORDARIEÆ. *Plants gelatinoso-cartilaginous, filiform or globose, composed of articulated filaments united together by a firm gelatine.*

24. CHORDARIA. *Frond* filiform; axis firmly gelatinous,

cellular. Circumference composed of simple, clavate, torulose, verticillate filaments.

25. TRICHOCLADIA. *Frond* filiform; axis loosely gelatinous, filamentous. Circumference composed of branched, coloured, torulose, verticillate filaments.

26. CORYNEPHORA. *Frond* globose or tuberose, hollow (not filled with gelatine.)

DIV. II. RHODOSPERMEÆ. *Plants marine (except one or two species of* TRENTEPOHLIA), *foliaceous, cylindrical, or filamentous, of a rose-red, purple or red-brown colour. Fructification in many genera double; primary, contained in capsules, receptacles, or immersed in the frond; secondary (when present) granules forming sori, or placed in distinct receptacles: seeds red or red-brown.*

TRIBE VIII. GLOIOCLADEÆ. *Plants gelatinous, filiform, entirely composed of articulated filaments, united into fronds by a hyaline gelatine (except in* CHÆTOSPORA, *in which genus only the ramuli have this structure.) Fructification globules of red seeds imbedded in the filaments of the periphery, to which they are attached.*

27. MESOGLOIA. *Frond* solid, gelatinous; the axis composed of longitudinal hyaline fibres; the periphery of radiating coloured filaments.

28. GLOIOSIPHONIA. *Frond* tubular, gelatinous; the periphery composed of radiating coloured filaments.

29. CHÆTOSPORA. *Frond* solid, subgelatinous; axis laxly cellular; the periphery membranaceous; ramuli composed of branched radiating filaments.

TRIBE IX. GASTROCARPEÆ. *Plants carnose or gelatinoso-membranaceous. Fructification: globules of red-seeds immersed in the substance of the frond.*

30. CATENELLA. *Frond* filiform, contracted as if jointed, in a moniliform manner.

31. DUMONTIA. *Frond* cylindrical, tubular, membranaceous, gelatinous within. *Fructification: globules* of seeds attached to the inner surface of the membrane of the frond.

32. HALYMENIA. *Frond* cylindrical, compressed, or flat, gelatinoso-membranaceous. *Globules* of seeds imbedded in the central substance of the frond.

33. IRIDÆA. *Frond* carnose, expanded, flat (not gelatinous.) *Globules* of seeds imbedded between the two coats of the frond.

TRIBE X. SPONGIOCARPEÆ. *Plants carnose, cylindrical, inarticulate. Fructification naked spongy warts, containing globules of red seeds. Root scutate.*

34. POLYIDES. The only genus.

TRIBE XI. FURCELLARIEÆ. *Plants carnose, cylindrical, inarticulate. Fructification terminal lanceolate receptacles. Root fibrous.*

35. FURCELLARIA. The only genus.

TRIBE XII. FLORIDEÆ. *Plants coriaceous, membranaceous, or cartilaginous; foliaceous or filiform, inarticulate. Fructification double;* 1. *Capsules:* 2. *granules, imbedded in the frond or indistinct receptacles.*

36. DELESSERIA. *Frond* leafy, with a percurrent, distinct midrib.

37. NITOPHYLLUM. *Frond* delicately membranaceous, expanded, ribless (often veined at the base). *Fructification* double: 1. Capsules: 2. ternate granules, disposed in distinct sori.

38. RHODOMENIA. *Frond* membranaceous, expanded, ribless. *Fructification* double: 1. Capsules; 2. ternate granules, disposed in cloud-like spots, or scattered over the whole frond.

39. PLOCAMIUM. *Frond* filiform, much branched, branches distichous, (ramuli pectinate.) *Fructification* double: 1. sphærical sessile capsules: 2. lateral process containing oblong granules.

40. ODONTHALIA. *Frond* subcartilaginous, plane, dark vinous-red, with an obsolete midrib, alternately toothed at the margin. *Fructification* marginal, double: 1. Capsules, containing pear-shaped seeds; 2. slender, pedicillate receptacles, containing ternate granules.

41. RHODOMELA. *Frond* cylindrical, cartilaginous, dark-red, (apices often involute.) *Fructification* double: 1. subglobose capsules, full of pear-shaped seeds; 2. pod-like receptacles, with imbedded ternate granules.

42. BONNEMAISONIA. *Frond* filiform, rose-red, delicate, much branched, branches pectinate, with distichous ciliæ. *Fructification:* ovate capsules, containing a mass of pyriform seeds fixed by their base.

43. LAURENCIA. *Frond* cylindrical, filiform, gelatinoso-cartilaginous, yellowish or purplish-red. *Fructification* double: 1. ovate capsules, containing pear-shaped seeds fixed by their base; 2. ternate granules imbedded in the ramuli.

44. Chylocladia. *Frond* filiform, cylindrical, (often constricted as if jointed,) gelatinoso-cartilaginous, pinky-red.—*Fructification* double: 1. capsules, with angular seeds; 2. imbedded ternate granules.

45. Gigartina. *Frond* cartilaginous, filiform, of a dull red colour. *Fructification* double: 1. capsules, with minute roundish seeds; 2. simple granules imbedded in the ramuli.

46. Chondrus. *Frond* cartilaginous, dilating upwards into flat, dichotomously-divided segments of a purplish or reddish colour. *Fructification:* roundish capsules.

47. Phyllophora. *Frond* proliferous from the disk, furnished with an obscure midrib.

48. Sphærococcus. *Frond* cartilaginous, two-edged, linear, distichously branched. *Fructification:* mucronate, pedicellate capsules, produced along the margin; seeds ovate.

49. Gelidium. *Frond* horny or cartilaginous, linear, more or less regularly pinnated. *Fructification* double: 1. capsules, imbedded in the ramuli; 2. ternate granules.

50. Ptilota. *Frond* compressed, filiform, pectinato-pinnate. *Fructification:* minute aggregated capsules, surrounded by an involucre.

Tribe XIII. Ceramieæ. *Plants filamentous, articulated.—Fructification double:* 1. *Capsules:* 2. *granules contained in receptacles, or in distorted ramuli.*

51. Polysiphonia. *Filaments* longitudinally striated with internal parallel tubes. *Fructification:* 1. ovate capsules; 2. granules in swollen ramuli.

52. Dasya. *Stems* inarticulate, cellulose, the ramuli articulated. *Fructification:* 1. ovate capsules: 2. lanceolate receptacles, including granules in transverse fasciæ.

53. Ceramium. *Filaments* reticulated, dissepiments opaque. *Fructification:* 1. roundish capsules, with membranous pericarps; 2. oblong granules imbedded in the ramuli.

54. Griffithsia. *Filaments* mostly dichotomous, dissepiments hyaline. *Fructification:* 1. clustered capsules with hyaline pericarps; 2. roundish, gelatinous, involucrated receptacles, including minute granules.

55. Calithamnion. *Filaments* mostly pinnated, dissepiments hyaline. *Fructification:* 1. scattered capsules with hyaline pericarps; 2. polymorphous receptacles, containing large granules.

56. Trentipohlia. *Filaments* minute, (mostly parasitical),

articulated, dissepiments hyaline. *Fructification* tufted, mostly terminal capsules; (one species inhabits fresh water.)

DIV. III. CHLOROSPERMEÆ. *Plants growing either in the sea, in fresh water or in damp ground, or in anomalous situations; filamentous, membranaceous, or amorphous; either hyaline, or (owing to the presence of an internal granular sporular mass) of a grass green, very rarely purple colour. Fructification green or purple sporules, either filling the frond, or collected into sporidia, rarely situated in external capsules.*

TRIBE XIV. LEMANIEÆ. *Plants growing in fresh water, filamentous, inarticulate, of a cellular substance. Fronds hollow, torulose at intervals. Fructification tufted, sporules affixed to the inner face of the tubular frond. (Inhabit alpine rivulets, rivers, &c.)*

57. LEMANIA. The only genus.

TRIBE XV. BATRACHOSPERMEÆ. *Plants growing in fresh water, filamentous, gelatinous. Fronds composed of aggregated, articulate, longitudinal fibres, whorled at intervals with short horizontal moniliform ramuli. Fructification: globular masses, composed of minute, dichotomous, moniliform strings of sporules.*

58. BATRACHOSPERMUM. The only British genus.

TRIBE XVI. CHÆTOPHOROIDEÆ. *Plants growing in fresh water or in the sea; filamentous, gelatinous. Filaments articulated, either free or collected into bundles, bound together by a more or less firm gelatine, thus forming amorphous fronds.— Fructification, minute capsules attached to the ramuli.*

59. BULBOCHÆTE. *Filaments* free, articulated; each articulation bearing at its truncate apex either an elongated, inarticulate, deciduous seta, or a sessile sphærical capsule.

60. DRAPARNALDIA. *Filaments* free, gelatinous; stems subhyaline, emitting at the joints pencils of coloured ramuli.

61. CHÆTOPHORA. *Filaments* collected into amorphous gelatinous fronds.

62. MYRIONEMA. *Plants* exceedingly minute, parasitical, consisting of a mass of simple, clavate, erect filaments, bound together by a firm gelatine.

TRIBE. XVII. CONFERVEÆ. *Plants growing in the sea or in fresh water, filamentous, articulate, destitute of distinct*

gelatine. Filaments simple or branched; articulations more or less filled with a granular coloured (mostly green) sporaceous mass, which affects various forms in different genera.

63. CONFERVA. *Filaments* simple or branched, free (not connected by transverse tubes): articulations filled with a granular coloured mass *(Endochrome.)*

64. MOUGEOTIA. *Filaments* simple, finally united by transverse tubes. *Endochrome* granular, at length forming roundish globules at the point of conjugation.

65. TYNDARIDIA. *Filaments* simple, finally inosculating by transverse tubes. *Endochrome* consisting of two roundish masses in each joint.

66. ZYGNEMA. *Filaments* simple, finally inosculating by transverse tubes. *Endochrome* forming dotted spiral rings.

TRIBE XVIII. SIPHONEÆ. *Fronds tubular, filamentous, inarticulate: filaments a horny or membranaceous substance, hyaline, filled with a green colouring matter; either free or formed into sponge-like fronds. Fructification, external often stalked vesicles full of granular matter.*

67. CODIUM. *Filaments* closely aggregated into a sponge-like frond. Marine.

68. BRYOPSIS. *Filaments* free, branched; branches pinnated. Marine.

69. VAUCHERIA. *Filaments* irregularly branched. *Fructification:* dark green vesicles attached to the frond.—Mostly in fresh water, rarely in the sea.

TRIBE XIX. OSCILLATORIEÆ. *Plants of a gelatinous substance and filamentous structure. Filaments slender, tubular, continuous, filled with a coloured, granular, transversely striate matter, seldom branched, though often agglutinated together so as to appear branched, usually massed together in broad floating or sessile strata of a very gelatinous nature; occasionally erect and tufted; and still more rarely collected in radiating series, bound together by firm gelatine, and then forming lobed or crustaceous fronds.*

70. RIVULARIA. *Frond* firmly gelatinous, globose or lobed; composed of filaments set in gelatine, radiating either from a fixed centre or base.

71. STIGONEMA. *Filaments* tufted, branched; branches transversely dotted.

72. SCYTONEMA. *Filaments* brown, branched, flaccid, tough; transversely striate.

73. CALOTHRIX. *Filaments* short, tufted, green or purple, simple or pseudo-branched.

74. LYNGBYA. *Filaments* green or purple, decumbent, very long, flaccid.

75. OSCILLATORIA. *Filaments* rigid, acicular, radiating and oscillating from a slimy stratum.

TRIBE XX. ULVACEÆ. *Plants of a membranaceous or gelatinous substance and simple structure. Frond either a tubular or flat, filiform or expanded membrane; or a gelatinous amorphous mass; or composed of an innumerable number of gelatinous globules; hyaline, or, owing to the presence of fructification, of a green, purplish, or pink colour. Fructification: minute granules, which are either scattered through the frond, or arranged in fours, or strung together in many moniliform, filamentous series.*

* *Plants membranaceous, not gelatinous.*

76. PORPHYRA. *Frond* foliaceous, purple.

77. BANGIA. *Frond* linear, capillary, transversely dotted.

78. ENTEROMORPHA. *Frond* tubular, hollow, simple or branched, somewhat reticulated, green.

79. ULVA. *Frond* foliaceous, membranaceous, green.

* * *Plants gelatinous.*

80. TETRASPORA. *Frond* gelatinoso-membranaceous, expanded, green. Sporules in fours.

81. PALMELLA. *Frond* a polymorphous, gelatinous mass, filled with scattered granules (sometimes arranged in fours.)

82. NOSTOC. *Frond* coriaceo-gelatinous, lobed, hollow or solid, filled with curled moniliform filaments.

83. PROTOCOCCUS. *Plant* consisting of aggregated minute globules (filled with granules), and sessile on a gelatinous mass.

TRIBE XXI. BYSSOIDEÆ. *Plants of doubtful affinity, related to the Fungi. Filaments articulated, hyaline, or coloured. Fructification very obscure. They are found on rotten wood, among mosses, on damp ground, on glass, or in chemical solutions and other anomalous situations.*

84. BYSSOCLADIUM. *Filaments* arachnoid, radiating from a centre, with scattered external granules.

85. Chroolepus. *Filaments* rigid, subsolid, opaque, torulose, falling to powder.

86. Protonema. *Filaments* subarticulated, rooting (among mosses.)

87. Hygrocrocis. *Filaments* hyaline, interwoven into a uniform membrane or gelatine.

88. Leptomitus. *Filaments* hyaline, erect, parasitical.

Div. IV. Diatomaceæ. *Plants growing in the sea or in fresh water, small, and for the most part very minute and parasitical; composed of rigid, fragile, more or less transparent corpuscles (frustula), variously united in parallel series, in circles, or in filaments; or scattered through a mucous mass; or disposed in longitudinal series, through gelatinous branched fronds.*

Tribe XXII. Desmidieæ. *Filaments cylindrical or angular, at length separating into frustula.*

89. Meloseira. *Frustula* forming simple, pseudo-articulated filaments, constricted at the articulation.

Tribe XXIII. Fragilarieæ. *Frustula plane, rectilinear, disposed in circles or filaments.*

90. Fragilaria. *Frustula* forming densely striated, fragile filaments (not cohering at the angles.)

91. Diatoma. *Frustula* forming fragile plane filaments, at length separating and cohering at the angles; or sessile, and arranged in a fasciculate or flabellate manner.

92. Frustulia. *Frustula* linear, free or imbedded in a gelatinous mass.

Tribe XXIV. Styllarieæ. *Frustula plane, wedge-shaped, disposed in circles or fans.*

93. Licmophora. *Frustula* stipitate, flabelliform.

94. Meridion. *Frustula* united into circles or segments of circles, sessile.

Tribe XXV. Cymbelleæ. *Frustula elliptical.*

95. Gomphonema. *Frustula* subgeminate, terminating a very slender, simple or branched filament.

96. Schizonema. *Frustula* in longitudinal series, and enclosed in a simple or branched, filiform, mucous, membranaceous frond.

Div. I. MELANOSPERMEÆ.

Plants marine; foliaceous, strap-shaped or filamentous; of an olive-brown or olive-green colour. *Fructification* contained in definite capsules or receptacles, or in distinct sori.

Tribe I. FUCOIDEÆ.

Marine plants of an olive-brown colour, changing to black in the air; of a coriaceous or ligneous substance, densely fibrous, and tearing in a longitudinal direction. Root scutate; in some species accompanied by creeping fibres. Frond flat, compressed, or filiform, in many producing distinct leaves; and in most, furnished with vesicles or air-vessels. Fructification, sphærical clusters of opaque seeds, surrounded by a pellucid limbus, imbedded in distinct gelatinous receptacles, and finally escaping by external pores.

1. Cystoseira. *Ag.* Cystoseira.

Frond compressed or filiform, more or less foliaceous, but without distinct leaves. *Vesicles* simple, usually in series, innate in the substance of the branches. *Receptacles* small, cylindrical or lanceolate, terminal. *Seeds* in distinct cells.—Name, κυστις, a *bladder*, and σειρα, a *chain*; from the moniliform arrangement of the vesicles.

1. C. *ericoides*, Ag. *Heath-like Cystoseira.* Frond cylindrical, branched, closely beset every where with very short, subulate, spinous branchlets; vesicles elliptical, solitary; receptacles swelling at the base of the terminal spines. *Grev.—Hook. Br. Fl. v.* ii. *p.* 265. *E. Bot. t.* 1968.

Rocks in the South and West of Ireland. Bantry Bay; *Miss Hutchins.* Miltown Malbay; *W. H. Harvey.*

2. C. *granulata*, Ag. *Granulated Cystoseira.* Frond cylindrical; stem bearing elliptical knobs, each producing a filiform, repeatedly dichotomo-pinnate branch, furnished with remote subulate spines; air-vessels elliptical-lanceolate, two or three connected together; receptacles elongated. *Grev. Hook. Br. Fl. v.* ii. *p.* 265. *E. Bot. t.* 2169.

Rocks, and rocky places left by the tide, in the west and south of Ireland. Bantry Bay; *Miss Hutchins.* Coast of Clare; *J. T. Mackay.* Black rocks, Portrush; *Mr. D. Moore.*

3. C. *fœniculacea*, Ag. *Fennel-leaved Cystoseira.* Frond compressed; stem destitute of tuberous knobs; branches more or less rough with little hard points, repeatedly pinnate, filiform; air vessels solitary, or about two together; receptacles

linear-lanceolate, mostly proceeding from the terminal vesicles. *Grev. Hook. Br. Fl. v.* ii. *p.* 265. *E. Bot. t.* 2131.

On the western and southern shores.

4. C. *fibrosa*, Ag. *Fibrous Cystoseira.* Frond bushy, very much branched; branches filiform, the terminating branchlets (or leaves) nearly plane; vesicles elliptical, mostly solitary; receptacles filiform, much elongated. *Grev. Hook. Br. Fl. v.* ii. *p.* 266. *E. Bot. t.* 1969.

On the western and southern shores. Galway Bay; *J. T. Mackay.* Bantry Bay; *Miss Hutchins.* Malbay; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.*

2. Halidrys. *Lyngb.* Halidrys.

Frond compressed, coriaceous, linear, pinnated with distichous branches. *Air-vessels* lanceolate, stalked, divided by transverse septa. *Receptacles* lanceolate, stalked, compressed. *Seeds* in distinct cells. *Grev.* Name; ἁλς, ἁλις, the *sea*, and δρυς, an *oak*, or *tree.*

1. H. *siliquosa*, Lyngb. *Podded Halidrys.* Vesicles compressed, petiolated, linear-lanceolate, attenuated to a point. *Hook. Br. Fl. v.* ii. *p.* 266. *E. Bot. t.* 474.

Common on all our shores. The beautiful *Fucus Osmundaceus*, *Turn. t.* 105, from the North-west Coast of America, is a second species of this genus.

3. Fucus. *Ag.* Fucus.

Frond plane, compressed or cylindrical, linear dichotomous, coriaceous. *Air-vessels* (when present) innate in the frond, simple. *Receptacles* terminal (except in *F. nodosus*), turgid, containing tubercles imbedded in mucus, and discharging their seeds by conspicuous pores. *Grev.*—Name; φυκος, a *sea-weed.*

1. F. *vesiculosus*, Linn. *Bladdered Fucus.* Frond coriaceous, flat, dichotomous, entire, furnished with a midrib; vesicles sphærical, (mostly in pairs); receptacles terminal, turgid, elliptical. *Hook. Br. Fl. v.* ii. *p.* 267. *E. Bot. t.* 1066.

Sea shores, very abundant. A very variable species: many of the varieties destitute of vesicles. Dr. Greville's *variety* "*Caterifructus*" is so completely intermediate with the following, that it may be debated to which species it most properly belongs.

2. F. *ceranoides*, Linn. *Horned Fucus.* Frond coriaceo-membranaceous, entire, furnished with a midrib, pinnated with lateral, dichotomous, fruit-bearing branches, without vesicles; receptacles lanceolate, linear, acuminated. *Hook. Br. Fl. v.* ii. *p.* 267. *E. Bot. t.* 2115.

On the eastern shores. Belfast Lough ; Wicklow, &c.—More membranaceous than the preceding, and apparently very different ; yet I am by no means convinced that this is specifically distinct. Though it does not produce *regular vesicles*, I have frequently seen the membranes of the frond become separated and irregularly vesicated, giving the branches a *blistered* appearance.

3. F. *serratus*, Linn. *Serrated Fucus.* Frond coriaceous, flat, dichotomous, with a central rib, serrated ; vesicles none ; receptacles solitary, terminal, plane, serrated. *Hook. Br. Fl. v.* ii. *p.* 267. *E. Bot. t.* 1221.

Rocky shores, abundant.

4. F. *nodosus*, Linn. *Knotted Fucus.* Frond compressed, subdichotomous, somewhat pinnately branched ; vesicles large, remote ; receptacles lateral, distichous, pedunculate. *Hook. Br. Fl. v.* ii. *p.* 268. *E. Bot. t.* 570.

Rocky shores, abundant.

5. F. *Mackaii*, Turn. *Mackay's Fucus.* Frond compresso-cylindrical, excessively branched, subdichotomous, coriaceous ; vesicles elliptical (often wanting), receptacles unknown. *Hook. Br. Fl. v.* ii. *p.* 268. *E. Bot. t.* 1927.

Sea-shores. Cunnamara ; *J. T. Mackay.* A very remarkable looking plant, yet I fear scarcely specifically distinct from the preceding.

6. F. *canaliculatus*, Linn. *Channelled Fucus.* Frond linear, narrow, channelled, dichotomous, without midrib or vesicles ; receptacles terminal, oblong, turgid. *Hook. Br. Fl. v.* ii. *p.* 268. *E. Bot. t.* 823.

Rocky shores, abundant. The smallest of the British species, and easily distinguished by its channelled fronds.

7. F. *tuberculatus*, Huds. *Tuberculated Fucus.* Frond cylindrical, naked below, dichotomous above, the axils obtuse ; vesicles elliptical at the base of the receptacles (often absent) ; receptacles elongated, cylindrical, terminal. *Hook. Br. Fl. v.* ii. *p.* 269. *Turn. Hist. Fuc. t.* 7.

Rocky shores, rather rare. North of Ireland ; *Dr. Scott.* Bantry bay ; *Miss Hutchins.* Very abundant on the west of the County of Clare.—*Root* accompanied by creeping fibres. The *vesicles*, which have not been noticed by preceding authors, are abundantly produced in the West of Ireland, where this plant is very common, and reaches a large size.

4. HIMANTHALIA. *Lyngb.* Himanthalia.

Frond coriaceous, orbicular, peziziform. *Vesicles* none. *Receptacles* (frond-like), elongated, strap-shaped, compressed, dichotomously divided, springing from the centre of the frond, containing immersed tubercles furnished with a pore. *Grev.* —Name ; ἱμας, αντος, a *strap*, and αλς, the *sea*.

1. H. *lorea*, Lyngb. *Strap-shaped Himanthalia or Sea-thongs. Hook. Br. Fl. v.* ii. *p.* 269. *Turn. Hist. t.* 196.

Rocky shores. *Fronds* one or two inches high, perennial, emitting receptacles from two to ten feet in length, which fall off annually.

Tribe II. LICHINEÆ.

Marine plants of a blackish green colour, changing to black in the air; cartilaginous, minute, without distinct leaves. Fructification: receptacles furnished with a terminal pore, "and filled with a colourless gelatinous mass of very fine filaments, among which pellucid oval or oblong seeds are disposed in many radiating moniliform series." Grev.—I am not at all satisfied about the true situation of this small tribe, but place it immediately after the Fucoideæ in compliance with the ideas of my valued friend Dr. Greville. In many respects, especially in the structure of the capsules or receptacles, it approaches some genera of *Lichenes.*

5. Lichina. *Ag.* Lichina.

Frond cartilaginous, blackish-green, dichotomous. *Fruct.*: roundish capsules (receptacles) of the same colour, containing radiating moniliform lines of pellucid *seeds*, imbedded in a gelatinous mass of filaments. *Grev.*—Name; an alteration of *Lichen*, to which tribe this bears a great resemblance.

1. L. *pygmæa*, Ag. *Dwarf Lichina.* Frond between flat and compressed; capsules globose. *Grev. Hook. Br. Fl. v.* ii. *p.* 270. *E. Bot. t.* 1332.

Rocks uncovered at low water mark, common. Forms little roundish tufts, about half an inch in height. *Fronds* crisp, dark green.

2. L. *confinis*, Ag. *Least Lichina.* Frond cylindrical; capsules terminal, oval. *Grev. Hook. Br. Fl. v.* ii. *p.* 270. *E. Bot. t.* 2575.

Rocks, near high water mark, not rare. Smaller than the last, and of a darker colour. Dr. Greville has taken much pains to distinguish this from the preceding, and has figured both admirably in his beautiful *Crypt. Flora* (*t.* 219 and 221); but I rather incline to Dr. Hooker's opinion, that their distinguishing characters depend on difference of locality.

Tribe III. LAMINARIEÆ.

Plants marine, of an olive-brown or olive-green colour, becoming rather darker on exposure; coriaceous or membranaceous, fibroso-cellular, not reticulated. Root lobed or fibrous. Frond stipitate, terminating in a leaflike expansion which is often cleft, and occasion-

ally midribbed, or variously costate. Fructification obscure; "as far as hitherto known, either seeds mixed with a mass of vertical, jointed filaments or roundish granules, without filaments; forming, in both cases, dense-spreading spots or sori, on the surface of some part of the frond." Grev.

6. ALARIA. *Grev.* Alaria.

Frond membranaceous, furnished with a percurrent, cartilaginous midrib, the stem pinnated with distinct leaflets. *Fruct.:* pyriform *seeds*, vertically arranged in the incrassated leaflets. *Grev.*—Name, *ala*, a *wing*, from the winged base of the frond.

1. A. *esculenta*, Grev. *Esculent Alaria.* Frond linear, ensiform, entire at the margin; pinnæ linear, oblong, fleshy." *Hook.—Br. Fl. v.* ii. *p.* 271. *E. Bot. t.* 1759.

Northern and western shores, abundant. A beautiful plant as it waves freely in the water. The *frond* is 3—10 or even 20 feet in length, and 1—6 inches in breadth, consisting of a membranaceous, very easily lacerated leaf, with a thick cartilaginous midrib. It is an annual.

7. LAMINARIA. *Lamour.* Laminaria.

Frond coriaceous (rarely membranaceous), plane, expanded, without a midrib. *Fruct.: seeds* or *granules* forming dense sori or spots, and imbedded in the thickened surface of some part of the frond. *Grev.*—Name; *lamina*, a *thin plate.*

1. L. *digitata*, Lamour. *Cleft Laminaria.* Stipes coarse, elongated, cylindrical, expanding into a broad roundish lamina, which is deeply cleft into numerous linear segments. *Hook. Br. Fl. v.* ii. *p.* 271. *E. Bot. t.* 2274.

Sea-shores, in deep water. 2—12 feet long, olive brown.

2. L. *bulbosa*, Lamour. *Bulbous Laminaria.* Root hollow, swollen, tuberculated, bulb-like; stipes flat, two-edged, twisted, and deeply sinuated near the base, expanding into a broad oblong lamina, which is deeply cleft into numerous linear segments. *Hook. Br. Fl. v.* ii. *p.* 271. *E. Bot. t.* 1760.

Sea-shores; not uncommon on any of our coasts.

3. L. *saccharina*, Lamour. *Sugary Laminaria.* Root fibrous; stipes cylindrical, elongated, expanding into a cartilaginous, flat, oblong, entire frond. *Hook. Br. Fl. v.* ii. *p.* 272. *Turn. Hist. t.* 163.

Sea-shores, very common.

4. L. *Phyllitis*, Lamour. *Thin-leaved Laminaria.* Root fibrous; stipes somewhat compressed, short, expanding into a

thin, membranaceous, linear-lanceolate, entire frond. *Hook. Br. Fl. v.* ii. *p.* 272. *E. Bot. t.* 1331. *Turn. Hist. t.* 164.

Sea shores, rare. Larne; *Mr. Templeton.* Bantry bay; *Miss Hutchins.* Black rocks, Portstewart, County of Derry; *Mr. D. Moore.* Distinguished from the preceding by its thin membranaceous substance and lanceolate outline; characters which are, I fear, not to be depended on.

Tribe IV. SPOROCHNOIDEÆ.

Plants marine, olivaceous or yellowish-green, much branched, the branches mostly distichous, foliaceous, compressed, or filiform, inarticulate, becoming flaccid on exposure to the air, "in some cases acquiring, under such circumstances, a verdigris-green colour, and then possessing the property of rapidly decomposing other delicate Algæ in contact with them." Fronds generally bearing, at some period of their growth, deciduous tufts of bright green filaments. Fructification imperfectly known; "composed of club-shaped, moniliform, radiating filaments, either forming sessile warts, or arranged concentrically in little stalked, club-shaped bodies, terminated by pencils of delicate fibres. Grev.—A small and natural family, in many respects allied to the Laminarieæ, from which tribe it is, however, well distinguished by the much branched frond, which produces, in its young state, delicate tufts of fibres, and does not become darker in drying or decay.

8. Desmarestia. *Lamour.* Desmarestia.

Frond plane or compressed, distichously branched; when young, furnished with marginal deciduous tufts of fine green filaments, the branches set with marginal spines. *Grev.—Fruct.* unknown.—Name; in honour of A. G. Desmarest, a French Naturalist.

1. D. *ligulata*, Lamour. *Ligulate Desmarestia.* Frond much branched, plane, with an obscure midrib, 3—4 times pinnated; pinnæ and pinnulæ linear-lanceolate, opposite, and (as well as every division of the frond) attenuated at the base. *Hook. Br. Fl. v.* ii. *p.* 273. *E. Bot. t.* 1636.

Not uncommon on any of our shores from the Giant's Causeway to Bantry bay. *Frond* 1—6 feet long.

2. D. *aculeata*, Lamour. *Thorny Desmarestia.* Frond excessively branched, branches alternate or irregular, very narrow, linear, compressed, many times divided in a pinnate manner; margin of the pinnules set with alternate spines. *Hook. Br. Fl. v.* ii. *p.* 273. *E. Bot. t.* 2445.

Sea-shores, common. The marginal spines are not produced till the

second year, but, in place of them, the young plants are clothed with beautiful tufts of bright green fibres.

9. Dichloria. *Grev.* Dichloria.

Frond cylindrical, filiform, cartilaginous, pinnated with opposite branches, becoming flaccid and of a verdigris-green colour on exposure to the air. *Fruct.* unknown. *Grev.*—Name; δις, *twice*, and χλωρις, *green*, "in allusion to its singular change of colour."

1. D. *viridis*, Grev. *Green Dichloria. Hook. Br. Fl. v.* ii. *p.* 274. *E. Bot. t.* 1669. *Turn. Hist. t.* 97.

Sea-coast. Near Belfast; *Dr. Drummond.* Bantry bay; *Miss Hutchins.*—1—2 feet long. *Frond* excessively branched, capillary, all the divisions exactly opposite.

10. Sporochnus. *Ag.* Sporochnus.

Frond filiform, cylindrical or compressed, cartilagineo-membranaceous. *Fruct.:* club-shaped, moniliform filaments, radiating in scattered *warts*, or concentrated in distinct (mostly clavate, stalked) *receptacles*, often terminated by a deciduous tuft of filaments. *Grev.*—Name; σπορος a *seed* or *sporule*, and χνοος, *wool*, in allusion to the tufts of fibres terminating the fructifications.

1. S. *pedunculatus*, Ag. *Pedunculate Sporochnus.* Frond slender, alternately branched in a pinnate manner; branches set with alternate, distichous, clavate receptacles, which are terminated with tufts of articulated fibres. *Hook. Br. Fl. v.* ii. *p.* 274. *E. Bot. t.* 345.

Marine rocks, rare. Bantry bay; *Miss Hutchins.* Killiney, very rare; *W. H. Harvey.* Mouth of the river Bann, among rejectamenta; *Mr. D. Moore.*

2. S. *villosus*, Ag. *Hairy Sporochnus.* Frond slender, once or twice pinnate; branches and pinnæ opposite, set with numerous whorls of dense branched filaments. *Hook. Br. Fl. v.* ii. *p.* 274. *E. Bot. t.* 546.

Very rare. Wicklow; *W. H. Harvey.*

3. S. *rhizodes*, Ag. *Root-like Sporochnus.* Frond rather robust, irregularly branched; branches subdichotomous, flexuose, covered with the wart-like fructification. *Hook. Br. Fl. v.* ii. *p.* 275. *E. Bot. t.* 1688.

In the sea: parasitic on various algæ. Bantry bay; *Miss Hutchins.* West of Ireland and at Wicklow; *W. H. Harvey.*

4. S. *Cabreræ*, Ag. *Cabrera's Sporochnus.* Frond irregularly dichotomous, linear, narrow, flat; branches here and there

constricted, truncate; fruit "terminal, elliptical, solitary." *(Turn.)* *Ag. Syst. p.* 260.—*Fucus Cabreræ. Turn. Hist. t.* 140.

At Youghal, among rejectamenta, very rare; *Miss Ball.* *Root* a shapeless tuber. *Stems* 6—8 inches high, much branched in an irregularly dichotomous manner, flat, nerveless, except near the base, where there is a faint trace of a central midrib, coriaceo-cartilaginous. *Branches* erect, with acute axillæ, distichous, alternate, narrow below, rather broader upwards, here and there constricted, the apices truncate and often discoloured. *Fructification,* "placed upon the ends of the branches, which then expand into a small flat disk, supporting a single cylindrical tubercle scarcely a line long, of a pale flesh colour, slightly tinged with brown, destitute of any epidermis, and wholly consisting of very thin parallel whitish fibres, of a clavate shape, with a rounded tip, mixed with which lie oblong reddish seeds."—*Turn. Hist. vol.* iii. *p.* 14.—*Miss Ball's* specimens are unfortunately without perfect fruit, though many of the apices present imperfect indications of fructification.

Tribe V. DICTYOTEÆ.

Plants marine, of an olive-green colour, and membranaceous flexible substance, rarely cartilaginous, and scarcely at all juicy, with a highly reticulated structure. Frond cylindrical or flat, simple or branched, nerveless (except in Haliseris), often divided in a flabelliform manner. Fructification, dark-coloured ovate or pear-shaped seeds, with pellucid cases, which are variously arranged in lines, sori, or covering the whole frond; very rarely enclosed in capsules.—A beautiful family, easily distinguished by the highly reticulated structure. Under the microscope, the frond appears like a delicate network.

11. Chorda. *Stackh.* Sea Whip-lash.

Frond simple, filiform, cylindrical, with an interrupted cavity. *Root* naked, scutate. *Fruct.:* external continuous masses of pear-shaped *seeds,* fixed by their base. *Grev.* Name; *chorda,* a *cord.*

1. C. *Filum,* Lamour. *Common Sea Whip-lash.* Frond cartilaginous, very long, slimy, cylindrical, internally jointed. *Hook. Br. Fl. v.* ii. *p.* 276. *E. Bot. t.* 2487.

Sea-shores, common. 1—20 or even 30 feet long, according to the depth of water; composed, as Captain Carmichael well expresses it, "of a simple fillet, one or two lines in breadth, spirally twisted into a filiform tube, formed by the cohesion of its edges."

2. C. *lomentaria,* Grev. *Jointed Whip-lash.* Frond short, membranaceous, jointed at irregular intervals, the joints externally much constricted. *Hook. Br. Fl. v.* ii. *p.* 276. *Lyngb.*

Hyd. Dan. t. 18. *Asperococcus castaneus. Carm. in Hook. Br. Fl. v.* ii. *p.* 277.

Sea-shores, not rare. Kingstown, near Dublin, and on the west coast; *W. H. Harvey.—Asperococcus castaneus* proves, as my friend Mrs. Griffiths first pointed out to me, to be the young of this species.

12. Asperococcus. *Lamour.* Asperococcus.

Frond simple, tubular, cylindrical or compressed, continuous, membranaceous. *Root* minutely scutate, naked. *Fruct.:* distinct spots of imbedded *seeds*, mixed with erect, club-shaped filaments. *Grev. Hook.*—Name; *asper, rough*, and κοκκος, a *seed.*

1. A. *fistulosus*, Hook. *Fistulose Asperococcus.* Frond cylindrical, tapering at each end, here and there slightly contracted. *Hook. Br. Fl. v.* ii. *p.* 277. *E. Bot. t.* 642. *Grev. Crypt. t.* 290.

Sea-shores, common. 6—12 inches long.

2. A.? *pusillus. Least Asperococcus.* Frond rounded, capillary, spuriously articulated, brown. *Hook. Br. Fl. v.* ii. *p.* 277. *Carm. MSS. cum, Ic.*

On *Chorda Filum.* Coast of Cork, Ballycotton; *Miss Ball.*—⊙. Autumn.—The fronds of this diminutive species are so closely aggregated, as to give to a section of the plant on which they grow, the appearance of a bottle-brush. They are from 1—2 inches long, simple, the thickness of a horse-hair, attenuated at both ends, transversely striated in imitation of joints, and closely beset with pellucid fibres. *Carm. MSS.*

3. A. *Turneri*, Hook. *Mr. Turner's Asperococcus.* Frond oblong, inflated, obtuse, attenuated at the base into a short stipes, thin and delicately membranaceous, here and there contracted. *Hook. Br. Fl. v.* ii. *p.* 277.—*Ulva Turneri. E. Bot. t.* 2570.—*A. bullosus, Grev.*

Rare. Bantry bay; *Miss Hutchins.* Abundantly thrown up on the Murrough, Wicklow; *W. H. Harvey. Miss Hutchins'* specimens are very fine, the fronds being 2—3 inches in diameter.

13. Punctaria. *Grev.* Punctaria.

Frond simple, membranaceous, flat, with a naked scutate root. *Fruct.* scattered over the whole frond in minute distinct spots, composed of roundish prominent *seeds*, intermixed with club-shaped filaments. *Grev.*—Name; *punctum*, a *dot*, from the dotted fructification.

1. P. *plantaginea*, Grev. *Plantain-leaved Punctaria.* Frond

coriaceo-membranaceous, linear-obovate, much attenuated at the base. *Hook. Br. Fl. v.* ii. *p.* 278. *E. Bot. t.* 2136.

Sea-shores. Wicklow and Killiney, near Dublin.

2. P. *latifolia*, Grev. *Broad-leaved Punctaria.* Frond pale-olive, thick, subgelatinous, tender, oblong, or obovate, suddenly tapering at the base. *Hook. Br. Fl. v.* ii. *p.* 278.—*Laminaria debilis. Ag.*—*Grev. Crypt. t.* 277. *(according to authentic specimens.)*

Rare. Belfast; *Dr. Drummond.* Kilkea, County of Clare; *W. H. Harvey.* This, I greatly fear, is nothing more than a pale variety of the preceding; both are extremely variable in outline, and, among numerous specimens with which Mrs. Griffiths' kindness has furnished me, I find every gradation of form and colour: some having the dark colour and substance of *P. plantaginea* with the outline of *P. latifolia;* while others unite the pale colour and delicate substance of *P. latifolia*, with the narrow outline and tapering base of *P. plantaginea.*—The same lady informs me that she has found both growing together in the same pool; a circumstance which seems to confirm the opinion that they are not distinct. But, however this may be, I feel no hesitation in referring *Laminaria debilis* of authors to this place, having minutely examined Chalmer's original specimens, and having found them to possess a reticulated and truly *dictyoteous* structure; in fact, having ascertained that they do not differ in any important particular from Devonshire specimens of *P. latifolia.*

14. Striaria. *Grev.* Striaria.

Frond filiform, tubular, continuous, membranaceous, branched. *Root* naked and scutate. *Fruct.:* groups of roundish *seeds*, forming transverse lines. *Grev.*—Name; from the *striated* appearance, caused by the lines of fructification.

1. S. *attenuata*, Grev. *Attenuated Striaria. Grev. Crypt. Syn. p.* 44. *Hook. Br. Fl. v.* ii. *p.* 279.—*Carmichaelia attenuata. Grev. Crypt. t.* 288.

Very rare. Belfast Lough; *Dr. Drummond.* 3—12 inches high, much branched, a line in diameter; branches long, irregular, attenuated at base and apex, elegantly marked by the transverse lines of seeds. A beautiful plant, first discovered by Captain Carmichael at Appin, in Scotland, and lately found by Mrs. Griffiths at Torquay, Devonshire; it may, therefore, be expected in intermediate stations.

15. Dictyosiphon. *Grev.* Dictyosiphon.

Frond filiform, tubular, continuous, branched. *Root* minutely scutate, naked. *Fruct.:* ovate scattered *seeds*, lying beneath the epidermis. *Grev.*—Name; δικτυον, a *net*, and σιφων, a *tube*, from the tubular reticulated frond.

1. D. *fœniculaceus*, Grev. *Fennel-leaved Dictyosiphon.*—

Hook. Br. Fl. v. ii. *p.* 279. *Turn. Hist. t.* 234. *E. Bot. Suppl. Grev. Alg. Brit. t.* 8.

On most of our coasts, both the eastern and western shores. 1—10 feet long or more, capillary, excessively branched and entangled. *Fruct.* very rare, and hitherto only described by Dr. Greville.

16. Dictyota. *Lamour.* Dictyota.

Frond flat, highly reticulated, membranaceous, dichotomous or irregularly cleft (palmato-flabelliform in *D. atomaria*). *Root* a mass of woolly filaments. *Fruct.* composed of scattered or variously aggregated, somewhat prominent *seeds*, on both surfaces of the frond. *Grev.*—Name: δικτυον, a *net*, the fronds, as in all this tribe, appearing reticulated when magnified.

1. D. *dichotoma*, Lamour. *Dichotomous Dictyota.* Frond olive-green, regularly dichotomous linear; segments becoming gradually narrower toward the extremities; seeds scattered or irregularly clustered. *Hook. Br. Fl. v.* ii. *p.* 280. *E. Bot. t.* 774.—*β. intricata, Grev.;* frond very narrow, much branched, twisted and entangled.

In the sea, on rocky shores, both varieties common.—β. greatly resembles the exotic *D. furcellata*, but differs in the segments becoming gradually attenuated; whereas, in that species, the frond is of one breadth throughout.

2. D. *atomaria*, Grev. *Sprinkled Dictyota.* Frond olive-brown, palmato-flabelliform or cuneate, irregularly cleft and laciniated; seeds forming waved transverse lines, with intermediate scattered ones. *Hook. Br. Fl. v.* ii. *p.* 280. *Grev. Alg. Brit. p.* 58.—*D. zonata* and *D. ciliata, Lamour.*—*Zonaria atomaria, Ag. Sp. Alg. v.* i. *p.* 128.—*Ulva atomaria, Woodw. E. Bot. t.* 419.

Marine rocks, Coast of Cork, near Ballycotton; *Miss Ball.*

17. Cutleria. *Grev.* Cutleria.

Frond plano-compressed, cartilagineo-membranaceous, subflabelliform, irregularly cleft. *Root* a mass of woolly filaments. *Fruct.:* minute tufts of *capsules*, scattered on both sides of the frond, the capsules pedicellate, containing several distinct *granules.*—*Grev.* Named by Dr. Greville in honour of my valued friend Miss Cutler of Sidmouth, a most acute and zealous algologist, and the discoverer in England of *Grateloupia filicina.*

1. C. *multifida*, Grev. *Multifid Cutleria.*—*Grev. Alg. Brit. p.* 60. *t.* 10.—*Ulva multifida, E. Bot. t.* 1913. *Hook. Br. Fl. v.* ii. *p.* 281.

Very rare. Bantry bay; *Miss Hutchins.* Ballycotton; *Miss Ball.* A single specimen found at Kilkee, County of Clare; *W. H. Harvey.* *Frond* 2—12 inches high, broadly flabelliform, cut, often nearly to the base, into many cuneate segments, which are again many times divided; the apices furnished with delicate confervoid fibres. *Miss Cutler*, who has favoured me with many beautiful specimens, remarks, in a letter, that, when fresh, "it is a stiff, rather thick, slightly curled plant, somewhat transparent, of a pale amber colour; so extremely brittle that the larger plants may be said to break with their own weight; on exposure to the air it becomes flaccid and turns brownish—in fresh water it changes to a greenish hue. As it is not very gelatinous it dries quickly under pressure, and leaves its impression, in a *permanent* brown colour, on the rags used to assist in drying it; a property common to many Algæ. Of the fructification I have nothing to add to the remarks of Dr. Greville, except that on one or two specimens I observe the fructification is placed in wavy transverse lines, as in *D. atomaria.* I find the delicate conferva-like fibres not only fringe the edge in clusters, but clothe the fronds of the young plants generally. May not these, by their elasticity, form a protection to so brittle a plant?" *Miss Cutler in litt.*

18. Padina. *Adans.* Padina.

Frond flat, highly reticulated, subcoriaceous, flabelliform, mostly undivided, marked with concentric lines. *Root* a mass of woolly filaments. *Fruct.:* ovate, blackish *seeds*, fixed by their base, bursting through the epidermis in compact, concentric lines (rarely spots) mostly on one surface of the frond. *Grev.* —Name of uncertain origin. *P. Pavonia*, one of the most remarkable of British Algæ, has not yet been found on our shores; but it may be expected to occur on the southern coasts of Cork or Waterford.

1. P. *parvula*, Grev. *Small Padina.* Frond resupinate, extensively creeping, suborbicular, lobed, membranaceous; lobes rounded, scarcely marked with concentric lines. *Grev. Crypt. Fl. t.* 360. *Hook. Br. Fl. v.* ii. *p.* 282.

Rocks in the sea, rare. Miltown Malbay; *W. H. Harvey.* *Fronds* olivaceous, depressed, creeping over the rock, to which they are attached by white fibres from the under surface. I have compared my specimens with English ones communicated by Miss Cutler, and find them to agree exactly.

2. P. (? ?) *deusta*, Grev. *Dark-brown Padina.* Fronds coriaceous, thick, brown, opaque, reniform or orbicular, with concentric lines, not reticulated, attached by the whole under surface. *Zonaria deusta, Ag. Sp. Alg. p.* 132. *Fucus deusta, Fl. Dan. t.* 420. *P. deusta, Hook. Br. Fl. v.* ii. *p.* 281.

Marine rocks. Miltown Malbay; *W. H. Harvey.* *Fronds* an inch or two in diameter, closely adhering to the rock on which they grow, of a rich brown colour and thick fleshy cellular substance, *not reticulated.* I have no idea to what tribe of Algæ this most properly

belongs ; but that it has no relation to Padina, or even to Dictyota, is obvious to any one who will take the trouble of examining it with the aid of a microscope. Its resemblance to Padina is merely superficial.

19. HALISERIS. - *Tozzetti.* Haliseris.

Frond flat, linear, membranaceous, with a midrib. *Root* a mass of woolly filaments. *Fruct.:* ovate *seeds*, forming distinct *sori* or groups (mostly arranged in longitudinal lines). *Grev.*—Name; αλς, αλις, *the sea*, and σεριs, *endive; sea endive.*

1. H. *polypodioides*, Ag. *Polypodium-like Haliseris.* Frond dichotomous (often proliferous), obtuse, entire at the margin. *Hook. Br. Fl. v.* ii. *p.* 283.—*Fucus membranaceus, Stackh. Ner. t.* 6. *E. Bot. t.* 1758.

Rocks in the sea, covered with sand, very rare. Quilty Strand, at extreme low-water mark, Miltown Malbay ; *W. H. Harvey.* 6—12 inches high, delicately membranaceous, and turning in an oblique direction from the margin to the midrib. When fresh it has an extremely powerful disagreeable smell.

TRIBE VI. ECTOCARPEÆ.

Plants marine, of an olive-green or (rarely) full-green colour, filamentous, often capillary or crinoid, articulated, cartilaginous or flaccid, not very juicy, nor adhering strongly to paper. Frond much branched, mostly of a uniform structure throughout ; articulations of the filaments mostly very short, (but very variable in the same filament, and not to be depended on in forming specific characters). Root minute, scutate. Fructification double, mostly monœcious (both kinds produced on the same individuals), 1. *Capsules containing dark-coloured seeds ;* 2. *granules imbedded in the distended, often vesicated apices of the ramuli.*

20. CLADOSTEPHUS. *Ag.* Cladostephus.

Filaments cartilaginous, inarticulate, whorled with short articulated ramuli, olivaceous. *Fruit* double: 1. ovate *capsules*, furnished with a terminal pore, containing dark seeds; 2. *granules* imbedded in the apices of the *ramuli.*—Name ; κλαδος, a *branch*, and στεφος, a *crown ;* from the whorled ramuli.

1. C. *verticillatus*, Lyngb. *Whorled-Milfoil Cladostephus.* Ramuli regularly whorled, subdistant, mostly forked; branches slender. *Harv. in Hook. Br. Fl. v.* ii. *p.* 322. *Conf. vertic. E. Bot. t.* 1718. and *t.* 2427. *f.* 2.

On the western coasts, not rare. 3—9 inches high, slender, the whorls of ramuli rather distant, by which character it is chiefly distinguished from the following.

2. C. *spongiosus*, Ag. *Sponge-like Cladostephus.* Ramuli irregularly whorled, imbricated, mostly simple; branches thick and clumsy. *Harv. in Hook. Br. Fl. v.* ii. *p.* 323. *Conf. spong. E. Bot. t.* 2427. *f.* 1.

Marine rocks, common. 3—4 inches high, dark olive brown.

21. Sphacelaria. *Lyngb.* Sphacelaria.

Filaments jointed, branches distichous, pinnated, rarely dichotomous, rigid. *Fruct.* double, on the same individual: 1. ovato-sphærical *capsules*, furnished with a terminal pore; 2. a granular *mass*, inclosed in the hyaline vesicated apices of the branches.—Name; Σφακελος, *gangrene;* from the *withered distended* apices.

1. S. *filicina*, Ag. *Ferny Sphacelaria.* Stuppose at the base; branches lanceolate, decomposite, pinnate; pinnæ alternate; pinnules fasciculato-multifid. *Br. Fl. v.* ii. *p.* 323. *Ag. Sp. Alg. v.* 2. *p.* 22. *S. hypnoides, Grev. Crypt. Fl. t.* 348.

In the sea, very rare. Bangor, County of Down; *Mr. W. Thompson.*

2. S. *scoparia*, Lyngb. *Broom-like Sphacelaria.* Dark brown, coarse, lower part shaggy with woolly fibres; upper branches once or twice pinnate; pinnæ erecto-patent, subulate, alternate, the lower ones slightly divided. *Harv. in Hook. Br. Fl. v.* ii. *p.* 323. *Dillw. t.* 52. *S. disticha, Lyngb. Harv. in Hook. Br. Fl. l. c. E. Bot. t.* 1552.

Rare on our shores. Killiney and Wicklow; *W. H. Harvey.* The winter and summer states of this species are so very unlike each other, that I formerly mistook them for distinct species, and published them as such in Dr. Hooker's British Flora. Since that work was printed, I have received numerous specimens, in every state of transition, from my kind friends *Mrs. Griffiths* and *Miss Cutler;* and I am now fully convinced that the *S. disticha* of the British Flora is only the autumnal or winter state of *S. scoparia.*

3. S. *plumosa*, Lyngb. *Feathery Sphacelaria.* Filaments elongated, naked at base, branched, inarticulate, pinnate; pinnæ opposite, very close, simple, pectinated, elongated, erecto-patent. *Harv. in Hook. Br. Fl. v.* ii. *p.* 324. *Conf. pinnata. E. Bot. t.* 2330. *(left hand fig.)*

Rocky coasts, rare. Wicklow; *W. H. Harvey.* 2—4 inches high, the branches resembling delicate feathers: colour greenish-olive.

4. S. *cirrhosa*, Ag. *Small pinnate Sphacelaria.* Filaments short, naked at the base, densely tufted, articulated throughout, pinnate; pinnæ alternate or irregular. *Harv. in Hook. Br. Fl. v.* ii. *p.* 324. *Conf. pinnata. Dillw. t.* 86. *E. Bot. t.* 2330. *(right hand fig.)*

On various marine Algæ, very common. Tufts half an inch to an inch or two in height, olive-brown.

5. S. *radicans*, Harv. *Creeping Sphacelaria.* Filaments decumbent, sending out fibrous radicles in the lower part, with a few irregular, simple, straight, naked branches. *Harv. in Hook. Br. Fl. v.* ii. *p.* 324. *Conf. radicans, Dillw. Lyn. p.* 57. *t. C. E. Bot. t.* 2138.

Sand covered rocks. Bantry bay; *Miss Hutchins.* A very doubtful species.

6. S. *olivacea*, Ag. *Olive Sphacelaria.* Filaments short, erect, tufted, sparingly branched; branches alternate, simple. *Harv. in Hook. Br. Fl. v.* ii. *p.* 235.—*Conf. olivacea. E. Bot. t.* 2172.

On rocks, and the larger Algæ. Dunmore; *Miss A. Taylor.*

7. S. *velutina*, Grev. *Velvet-like Sphacelaria.* "Olivaceous, spreading, velvet-like; filaments subsimple, erect, very short, bearing capsules at the base, joints about equal in length and breadth." *Grev. Crypt. Fl. t.* 350. *Harv. in Hook. Br. Fl. v.* ii. *p.* 325.

Parasitical on *Himanthalia lorea. Filaments* about a line in height, forming velvetty patches. It has but a very feeble claim to be considered a member of the present genus, and would, in my opinion, range much better with *Myrionema.*

22. Ectocarpus. *Lyngb.* Ectocarpus.

Filaments capillary, olivaceous or brown, flaccid, without longitudinal striæ. *Fruit*, sphærical or siliquæform *capsules* and *granules* in swollen ramuli.—Name; εκτος, καρπος, *external fruit;* equally applicable to many other genera.

1. E. *littoralis*, Lyngb. *Common Ectocarpus.* Filaments densely tufted, excessively branched; ultimate ramuli somewhat patent, alternate or fascicled; capsules sphærical, sessile. *Harv. in Hook. Br. Fl. v.* ii. *p.* 325.—*Conf. litt. E. Bot. t.* 2290.

On the larger Algæ, very common. *Tufts* 1—6 inches long, brown, coarse.

2. E. *siliculosus*, Lyngb. *Pod-fruited Ectocarpus.* Filaments flaccid and slender, tufted; ultimate ramuli erect, subulate, alternate or fascicled, capsules siliquæform, lanceolate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 325.—*Conf. silic. E. Bot. t.* 2319.

Sea-shores, on Algæ, corallines, &c. 2—12 inches high, pale yellow, distinguished by the siliquæform fruit.

3. E. *tomentosus*, Lyngb. *Woolly Ectocarpus.* Filaments flexuose, very slender, woven into a dense sponge-like branch-

ing frond; siliquæ oblong, obtuse. *Harv. in Hook. Br. Fl. v.* ii. p. 326.

Sea-shores, not rare on the east coast. Bantry bay; *Miss Hutchins.* Ardmore; *Miss Ball.* Habit something like that of *Codium tomentosum.*

4. E. *granulosus*, Ag. *Granular Ectocarpus.* Filaments excessively branched, slender, upper branches short, patent, opposite; apices elongated and hyaline; capsules solitary, elliptical. *Harv. in Hook. Br. Fl. v.* ii. *p.* 326. *E. Bot. t.* 2351.

On other Algæ. Bantry bay; *Miss Hutchins.* Mangan's bay; *Miss Ball.* 3—10 inches long, delicate: *capsules* large, dark, seated in the ultimate branches.

5. E. *sphærophorus*, Carm. *Round-fruited Ectocarpus.* Filaments slender, tufted; upper branches patent, opposite or in fours; capsules globose, opposite to each other or to a branch. *Harv. in Hook. Br. Fl. v.* ii. *p.* 326.—*E. brachiatus, Ag. (not Conf. brachiata of E. Bot.)*

On other Algæ. Bantry bay; *Miss Hutchins.* The Bantry bay station for *E. mertensii*, given in Eng. Bot. and Hooker's Br. Flora, must be cancelled. I have examined *Miss Hutchins'* specimens so named, and find them to belong to this, and the preceding species. The true *E. mertensii*, which is an extremely rare and little known plant, is regularly distichous and beautifully bipinnate; the pinnæ scarcely one-fourth the thickness of the branch in diameter.

23. Myriotrichia. *Harv.* Myriotrichia.

Primary filament olivaceous, flaccid (simple), beset with setiform, obtuse, quadrifarious *ramuli;* their apices bearing crinoid, hyaline, dichotomous, long articulated filaments. *Fruct.:* ovate capsules, including a mass of olivaceous seeds. —Name from *μυριος, a thousand*, and *θριξ*, a *hair;* from the innumerable hyaline, hair-like filaments which spring from the apices of the ramuli.

1. M. *clavæformis*, Harv. *Club-shaped Myriotrichia. Harv. in Hook. Journ. of Bot. vol.* 1. *p.* 300. *t.* 138. *Wyatt. Alg. Danm. No.* 131.

Parasitical on *Chorda lomentaria.* At Cable Island, near Youghal; *Miss Ball. Fronds* half an inch high, tufted, slender, flaccid, subgelatinous, olivaceous, lineari-clavate, (in outline,) surrounded with hyaline filaments. *Frond* articulated throughout, the articulations of the *stem* and *ramuli* very short; of the hyaline filaments many times longer than their breadth. This curious little plant was originally discovered at Torquay, in Devonshire, by *Mrs. Griffiths*, and has recently been added to our Flora by *Miss Ball*, an acute and zealous algologist, and the discoverer in this country of *Sporochnus Cabreræ*, and several other rare plants.

Tribe VII. CHORDARIEÆ.

Plants marine, of an olive-green or olive-brown colour, becoming darker on exposure, of a cartilaginous or gelatinous substance, and celluloso-filamentous structure. Frond filiform (except in Corynephora, which is globose and tuberculose,) much branched, cylindrical; the centre or axis, composed either of longitudinal, aggregated, colourless, jointed filaments, or of a solid cellular substance; the periphery, consisting of coloured, simple or branched, somewhat clavate toruloso-articulated filaments, disposed in a verticillate manner round the axis. Fructification (so far as ascertained), ovate or pyriform olive-coloured seeds (capsules?) enveloped in pellucid cases, imbedded among the filaments of the periphery, to whose ramuli they are laterally attached.—To *Chordaria*, a genus which Dr. Greville places by itself in this family, I have ventured to add another *(Trichocladia)*, which is very nearly allied to it in structure and fructification, but which has till now been confounded with *Mesogloia*; and *Corynephora*, a plant perhaps of uncertain affinities, but which approaches in structure more nearly to *Trichocladia* than to any other. The family thus constituted is allied on the one hand to the *Dictyoteæ*, and on the other to the *Gloiocladeæ*. From the latter it chiefly differs in colour, and in the structure of the fructification.

24. Chordaria. *Ag.* Chordaria.

Frond filiform, much branched. *Axis* cartilaginous, firmly gelatinous, cellular. *Periphery* composed of simple, clavate, torulose, verticillate filaments. *Fruct.:* "obovate brown *seeds (capsules?)*, mixed with the filaments of the periphery." *Carm.*—Name: *Chorda*, a *cord.*

1. C. *flagelliformis*, Ag. *Common Chordaria.* Frond filiform, equal throughout; branches alternate, exceedingly long and mostly simple. *Hook. Br. Fl. v.* ii. *p.* 175. *E. Bot. t.* 1222.

Sea-coast, on rocks and stones, common. 3—12 inches long, slender, dark olive-brown. Captain Carmichael observes, that, "in young plants, there is little or no vestige of the filaments" of the periphery, and that "their development appears to keep pace with that of the sporidia." I am sorry that my own observations are directly at variance with this account, for I have found these filaments as perfectly formed in plants not two inches high as in those of full growth.

25. Trichocladia. *Harv.* Trichocladia.

Frond filiform, much branched. *Axis* loosely gelatinous, composed of articulated, hyaline fibres. *Periphery* consisting of

branched, coloured, torulose, verticillate filaments. *Fruct.* ovate or elliptical, olivaceous *seeds (capsules?)* attached to the ramuli of the periphery.—Name; θριξ, a *hair*, and κλαδος, a *branch;* the branches being composed of hair-like filaments.

1. T. *vermicularis*, Harv. *Worm-like Trichocladia.* Frond clumsy; branches irregularly pinnate, thick, vermicular, linearifusiform; ramuli copious, elongated, flexuose, resembling the branches. *Mesogloia vermicularis, Ag. Harv. in Hook. Br. Fl. v.* ii. *p.* 387. *Riv. verm, E. Bot. t.* 1818.

Sea-shores, not uncommon. 1—2 feet high. *Branches* clumsy, attenuated toward each end. *Capsules* ovate, abundantly produced.

2. T. *Griffithsiana*, Harv. *Mrs. Griffiths' Trichocladia.* Frond slender, equal throughout; branches alternate or irregular, filiform, long, simple, nearly bare of ramuli. *Mesogloia Griffithsiana, Grev. Harv. in Hook. Br. Fl. v.* ii. *p.* 387.

Sea-shores, rare. Bantry bay; *Miss Hutchins.* 8—16 inches high of a pale rather olive-green, becoming greener in fresh water. *Branches* long, subsimple, covered with long colourless byssoid fibres, similar to those found in *Chordaria flagelliformis*, a plant which this species strongly resembles in habit. *Capsules* pyriform.

3. T. *virescens*, Harv. *Greenish villous Trichocladia.* Frond filiform, gelatinous; branches long, erecto-patent, slender, villous; ramuli numerous, patent, short, flexuose. obtuse. *Mesogloia virescens, Carm. Harv. in Hook. Br. Fl. v.* ii. *p.* 387. *Berk. Gl. Br. Alg. p.* 44. *t.* 17. *f.* 2. *(also M. affinis, Berk. and M. gracilis, Carm.—Berk. Alg. t.* 16. *f.* 2. *and t.* 17. *f.* 1.*)*

Sea-shores. Bantry bay; *Miss Hutchins.* I have examined the *M. gracilis* of Captain Carmichael, and do not consider it specifically distinct from the present; and though I have not seen specimens of Mr. Berkeley's *M. affinis*, yet, judging from the figure and description of that author, I can consider it but as the young of this species.

26. Corynephora. *Ag.* Corynephora.

Frond globose or lobed, carnoso-coriaceous, hollow (not filled with gelatine), composed of articulated dichotomous *filaments*, fasciculated at the apices, and issuing from a central point. *Fruct.:* oval *capsules*, seated in the terminal fasciculi.—Name; κορυνη, a *club*, and φορεω, to *bear;* the apices of the filaments, which constitute the periphery, are *clavate.*

1. C. *marina*, Ag. *Marine Corynephora. Ag. Lyst. Alg. p.* 24. *Harv. in Hook. Br. Fl. v.* ii. *p.* 390. *Grev. Crypt. t.* 25. *(imperfect.)*

On rocks in the sea, very common. *Frond* carnose, forming many hollow lobed tubers, and spreading over a large space, olive-brown. In young plants the lobes are filled with wide hyaline dichotomous

fibres, originating from a centre point, which are analogous to the filaments that constitute the *axis* of *Trichocladia*. The axis of this genus must, therefore, be considered as *punctiform*, and this, indeed, forms the only really structural difference between the two genera.

Div. II. RHODOSPERMEÆ.

Plants marine (except one or two species of *Trentepohlia*), foliaceous, cylindrical or filamentous, of a rose-red, purple, or red-brown colour. *Fructification* in many genera double; *primary*, contained in capsules, receptacles, or imbedded in the frond; *secondary* (when present), granules forming sori, or placed in distinct receptacles.

Tribe VIII. GLOIOCLADEÆ.

Plants marine, of a rose-red or purple colour, giving out a red juice on immersion in fresh water, of a gelatinous, lubricous substance, and filamentous, rarely cellular structure. Frond filiform, branched, cylindrical, solid or tubular; the periphery (except in Chætospora, in which genus, no parts, except the ultimate ramuli, are composed of filaments,) consisting of coloured, branched, verticillate fibres. Fructification: clusters or globules of red seeds, imbedded among the filaments of the periphery, to which they are attached.—In the British Flora, I used the name *Gloiocladeæ* in a wide sense, applying it to all the Tribes of Algæ, whose fronds are invested with a definite gelatine. I now wish to restrict it to a tribe, which is very conveniently placed at the commencement of this division, seeing it stands almost intermediate in affinities between the *Chordarieæ* and *Gastrocarpeæ*, agreeing with the former in the formation of the frond, and with the latter in colour and in the structure of the fruit.

27. Mesogloia. *Ag.* Mesogloia.

Frond filiform, solid; the axis or central part gelatinous, formed of longitudinal, hyaline, jointed fibres; the *periphery* composed of radiating, coloured, branched, articulated filaments. *Fruct.:* globules of red *seeds*, imbedded in the filaments of the periphery, to which they are attached.—Name; μεσος, the *middle*, and γλοιος, *viscid*, from the gelatinous axis.

1. M. *multifida*, Ag. *Dichotomous Mesogloia.* Frond dichotomous, slightly branched, dull purple, elastic; the axils rounded. *Harv. in Hook. Br. Fl. v.* ii. *p.* 385. *Berk. Alg. t.* 16. *f.* 1.

On shells and stones near low-water mark, frequent. *Frond* 3—6 inches long, often sub-simple, or once or twice dichotomous, 1—2 lines in diameter, very elastic. *Axis* much denser than in the following, not clearly filamentous; but rather, as Captain Carmichael expresses it, "a medullary cord."

2. M. *Hudsoni*, Ag. *Hudson's Mesogloia.* Frond much branched, filiform, pale-reddish; branches mostly opposite, once or twice pinnate; ramuli numerous, irregular, obtuse. *Harv. in Hook. Br. Fl. v.* ii. *p.* 386. *Ulva rubens, Huds. Fl. Angl. p.* 571.

On rocks and Algæ in the sea. Bantry bay; *Miss Hutchins.* Kilkee, County of Clare, and Killiney; *W. H. Harvey.* 4—8 inches long, excessively branched, slender, filiform, pale-red. Notwithstanding that the opinion of my valued friend, *Mr. Walker Arnott,* founded on a specimen from *Sir Thomas Frankland,* is against me, I am unwilling to omit the reference to the *U. rubens* of Hudson, as given above. In defence of this opinion I have, however, no better plea than that Hudson's description—*U. gelatinosa filiformis ramosissima rubescens, ramis sparsis noris entalibres obtusis*"—answers mostly correctly to the present species, and will not apply to any other.

3. M. *purpurea*, Harv. *Purple Mesogloia.* Frond attenuated at the base; branches distichous, linear-fusiform, elongated, simple, nearly bare of ramuli. *Hook. Br. Fl. v.* ii. *p.* 386.

Ireland's Eye; *Mr. R. Ball.* 1—2 feet high, robust, purple-red, staining fresh water pink. *Stem* subsimple, irregularly branched. *Branches* subalternate, distichous, long, simple, patent, constricted at the base, attenuated to a fine point.

4. M. *coccinea*, Ag. *Moniliform Rose-red Mesogloia.* Frond much branched, rose-red; branches moniliform, irregularly dichotomous, attenuated; ramuli numerous, crowded round the apex, subattenuate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 386. *Riv. verticillata. E. Bot. t.* 2466.

Sea-shores, extremely rare. Bantry bay; *Miss Hutchins. Frond* 2—6 inches high, fine rose-red, very gelatinous and delicate. The *branches* and *ramuli* are moniliform in consequence of the whorls of filaments forming the periphery being sub-distant.

28. Gloiosiphonia. *Carm.* Gloiosiphonia.

Frond cylindrical, filiform, tubular, somewhat gelatinous; the periphery composed of radiating, coloured, branched, articulated filaments. *Fruct.: globules* of red seeds, imbedded in the filaments of the periphery, to which they are attached.—Name; γλοιος, *viscid,* and σιφων, a *tube;* from the gelatinous tubed frond.—This genus, founded on the *Fucus capillaris* of Turner, was originally proposed by the late Captain Carmichael, in his unpublished "*Algæ Appinenses,*" and has been adopted by *Mr. Berkeley.* Except in the tubular frond, it does not differ from *Mesogloia.*

1. G. *capillaris*, Carm. *Banded Gloiosiphonia. Berk. Alg. t.* 17. *f.* 3. *Fucus cap. Turn. t.* 31. *E. Bot. t.* 2191. *Mesogloia? capillaris, Ag. Harv. in Hook. Br. Fl. v.* ii. *p.* 386.

Very rare. Bantry bay; *Miss Hutchins. Fronds* 3—6 inches long, much branched, fine rose-red, often a line in diameter. *Branches* mostly opposite, attenuated at the base. *Ramuli* very numerous, short, slender, flexuose, subulate. *Globules* of fructification large.

29. Chætospora. *Ag.* Chætospora.

Frond cylindrical, filiform, solid, subgelatinous, rose-red; the centre *(axis)* laxly cellular; the *periphery* membranaceous. *Ramuli* setaceous, fusiform, composed of articulated, branched, radiating filaments, and containing a mass of minute *red seeds.*—Name; χαιτη, a *bristle*, and σπορα, a *seed* or *sporule*; the filaments of the ramuli being supposed by some to be connected with the fructification. Though the structure of this curious plant (except as regards the ramuli) is perhaps more that of the following tribe *(Gastrocarpeæ)* than of the *Gloiocladeæ*; yet in habit it so completely agrees with *Mesogloia* and *Gloiosiphonia*, that I do not wish to place them in different families. The *periphery*, too, consists of exceedingly minute longitudinal fibres, firmly agglutinated into a membrane. May not *Chætospora*, therefore, be regarded as a *Mesogloia*, wanting the verticillate filaments?

1. C. *Wigghii*, Ag. *Mr. Wiggs' Chætospora. Hook. Br. Fl. v.* ii. *p.* 306. *Fucus Wigghii. Turn. Hist. t.* 102. *E. Bot. t.* 1165.

Very rare. Bantry bay; *Miss Hutchins.* Kilkee, County of Clare, extremely rare; *W. H. Harvey. Frond* 6—12 inches long, much branched, fine rose-red. *Ramuli* 1—2 lines long, fusiform, containing a dark mass of granules.

Tribe IX. GASTROCARPEÆ.

Plants marine, of a pink, purple, or dull red colour, of a carnose, gelatinoso-cartilaginous or membranaceous substance; "the structure consisting of a cellular external coat or membrane, and a pellucid, gelatinous, internal mass, mostly traversed by colourless jointed filaments arising from the outward membrane." Frond cylindrical, compressed, or flat, destitute of midrib or veins. Fructification: globules or clusters of minute red seeds imbedded in the internal substance of the frond.

30. Catenella. *Grev.* Catenella.

Frond filiform, somewhat compressed, creeping, throwing up

numerous branches, contracted, as if jointed, in a moniliform manner, composed internally of branched filaments radiating from the centre. *Fruct.* unknown. *Grev.*—Name; *catenella*, a little chain, which its fronds resemble.—A genus of a very questionable character, which I adopt entirely in deference to Dr. Greville, though by no means convinced of the propriety of so doing.

1. C. *Opuntia*, Grev. *Opuntia-like Catenella. Grev. Alg. p.* 166. *t.* 17. *Hook. Br. Fl. v.* ii. *p.* 309. *Fucus Opuntia. Turn. t.* 107. *Rivularia Opuntia. E. Bot. t.* 1868.

Marine rocks, near high-water mark. *Fronds* tufted from half an inch to an inch and half in height, dull purple.

31. Dumontia. *Lamour.* Dumontia.

Frond cylindrical, simple or branched, membranaceous, tubular, gelatinous within, of a red or purplish-red colour. *Fruct.:* globules of seeds, attached to the inner surface of the membrane of the frond. *Grev.*—Named in honour of M. Dumont, a French Naturalist.

1. D. *filiformis*, Grev. *Filiform Dumontia.* Frond tender, membranaceous, cylindrical, pinnated with long simple branches, which are attenuated at each extremity. *Hook. Br. Fl. v.* ii. *p.* 308. *U. purpurascens, E. Bot. t.* 641.—*β. crispata;* frond compressed, waved, curled, or twisted. *Grev. Crypt. t.* 240.

Rocks and stones in the sea, common. 3—12 inches long, dull purple.

32. Halymenia. *Ag.* Halymenia.

Frond cylindrical, compressed or flat, gelatinoso-membranaceous, of a pinky red colour, subdichotomously branched. *Fruct.:* globules of *seeds*, imbedded in the central substance of the frond.—Name; ἁλς, αλις, the *sea*, and ὑμην, a *membrane; sea-membrane.*

1. H. *ligulata*, Ag. *Ligulate Halymenia.* Frond gelatinoso-membranaceous, compressed or flat, irregularly dichotomous or palmate, the segments attenuated, often proliferous at the margin. *Hook. Br. Fl. v.* ii. *p.* 308. *Ulva ligulata. E. Bot. t.* 429. *U. rubra, Huds.—β. latifolia;* frond very broad, palmate, dark-red, quite flat, membranaceous.

Sea-shores, rare. Bantry bay; *Miss Hutchins.*—β. at Miltown Malbay and Kilkee, County of Clare; *W. H. Harvey.* Very variable in size, in the breadth and thickness of the frond, and in the ramification. Sometimes it is nearly filiform and cylindrical. β. is a truly remarkable variety, which, at one time, I felt disposed to regard as a distinct species; but after comparing many varieties from the South of England, kindly furnished by my valued friends Mrs. Griffiths and

Miss Cutler, with my Irish specimens, I have feared that the distinguishing characters are too variable to be depended on. The frond in my largest specimen is about 18 inches long, and 4—5 inches wide in the broadest part; cloven into three principal segments, with a palmate outline. When fresh, it had a soft feel like fine kid leather; and was not thicker than the membrane of *Rhodomenia reniformis*, perfectly flat, and with a darker colour than in the more common variety.

2. H. *furcellata*, Ag. *Forked Halymenia.* Frond tender, gelatinoso-membranaceous, cylindrical, uniformly dichotomous, the segments obtuse. *Hook. Br. Fl. v.* ii. *p.* 308. *Ulva furcellata. E. Bot. t.* 1881.

Very rare on our coasts; Bantry Bay; *Miss Hutchins.* Quilty Strand, Miltown, Malbay; *W. H. Harvey.* Distinguished from the preceding by the regular dichotomous frond. *Miss Hutchins's* specimens are remarkable for possessing a more or less distinct midrib: in one specimen this is so fully developed, that, were there not intermediate states from the strongest to the most imperfectly ribbed, I might have mistaken it for a distinct species. The branches (particularly in these Bantry specimens) are frequently constricted, so as in some instances to form regular septa at the strictures.

33. Iridæa. *Bory.* Iridæa.

Frond flat, expanded, carnose, more or less of a purple-red colour. *Fruct.:* globules of roundish seeds, imbedded between the two coats of the frond, or contained in little pedicillated processes.—Named from the *iridescent* hues of some of the species when recent.

1. I. *edulis*, Bory. *Esculent Iridæa.* Frond simple, obovate or cuneiform, rounded at the apex, attenuated at the base into a short stipes. *Hook. Br. Fl. v.* ii. *p.* 380. *F. edulis. E. Bot. t* 1307.

Sea-shores, abundant. 2—18 inches long; dark purple.

Tribe X. SPONGIOCARPEÆ.

Marine plants, of a dull dark-purple colour; of a cartilaginous or carnose substance, and fibrous structure. Frond cylindrical, dichotomous; the central part composed of very slender, closely packed, longitudinal fibres; the circumference formed of radiating dichotomous filaments. Root scutate. Fructification double (?); 1. *naked spongy warts, composed of radiating filaments, among which are imbedded globules of red seeds;* 2. *minute granules immersed in the substance of the slightly swollen upper ramuli.*

34. Polyides. *Ag.* Polyides.

Frond cylindrical, dichotomous; *root* scutate. *Fruct.:* naked spongy *warts*, composed of radiating filaments, among which are imbedded clusters of wedge-shaped *seeds*. *Grev.*—Name; πολυ, *many*, and ιδεα, *form* or *appearance;* not at all applicable. It is to be regretted that Dr. Greville's excellent name, *Spongiocarpus*, not having the claim of priority, cannot be adopted.

1. P. *rotundus*, Grev. *Cylindrical Polyides. Grev. Alg. t.* 11. *Hook. Br. Fl. v.* ii. *p.* 284.—*P. lumbricalis. Ag.*—*Fucus rotundus, E. Bot. t.* 1738.

Sea coasts, not rare. *Fronds* 4—6 inches high, dark purple, several times dichotomous; the axils obtuse.

Tribe XI. FURCELLARIEÆ.

Marine plants, of a dull dark purplish colour, of a carnose substance and cellular structure. Frond cylindrical, dichotomous; the central part closely cellular; the circumference composed of radiating simple filaments. Root creeping. Fructification: terminal pod-like indehiscent receptacles, within which is imbedded, beneath the outer coat, a stratum of dark red-brown seeds.—Very similar to the preceding family in habit, but decidedly differing in structure and in the fructification.

35. Furcellaria. *Lamour.* Furcellaria.

Frond cartilaginous, cylindrical, dichotomous. *Root* creeping. *Fruct.:* terminal, elongated, pod-like receptacles, containing a stratum of dark, oblong, pear-shaped *seeds* in the circumference. *Grev.*—Name; *furcula* or *furcilla*, a *little fork;* from the forked frond.

1. F. *fastigiata*, Lamour. *Fastigiate Furcellaria. Grev. Alg. t.* 11. *Hook. Br. Fl. v.* ii. *p.* 283.—*Fucus lumbricalis.*—*Turn. Hist. t.* 6. *E. Bot. t.* 894.

Rocky shores, common. *Frond* 6—8 inches long, purplish-brown, dichotomous; axils acute.

Tribe XII. FLORIDEÆ.

Plants marine, of a purplish-red or fine rose colour, of a coriaceous, cartilaginous or membranaceous substance and cel-

lular texture; cellules often highly developed. Frond flat, foliaceous, compressed or cylindrical, occasionally filiform or filamentous, inarticulate. Fructification mostly double, and produced on distinct individuals of the same species. 1. *Capsules, or tubercles, containing a mass of ovate or pear-shaped red seeds:* 2. *granules, scattered or collected into little groups, and situated either in the substance of the frond or in distinct processes.*

36. DELESSERIA. *Lamour.* Delesseria.

Frond rose-red, flat, membranaceous, with a percurrent midrib. *Fruct.* of two kinds. *Capsules* containing a globular mass of *seeds* and ternate *granules*, forming definite sori in the frond or in distinct foliaceous leaflets. *Grev.*—This beautiful genus, distinguished from every other in the tribe by its percurrent midrib, is inscribed to M. Benjamin Delessert, a distinguished French naturalist and patron of Botany.

1. D. *sanguinea*, Lamour. *Oak-leaved Delesseria.* Stem cylindrical, branched, bearing oblong, waved, transversely veined, entire leaves; midrib percurrent, strong. *Hook. Br. Fl. v.* ii. *p.* 285.—*F. sang. E. Bot. t.* 1041.

Sea-shores, frequent; particularly large at Larne; *Dr. Drummond. Stem* elongated, bearing leaves 6—8 inches long and 1—5 broad, delicate, waved and plaited, the margin quite entire. *Fructification* is only borne on the battered fronds in winter and spring. Miss Ball finds a curious variety at Youghal, in which small leaflets spring from the midrib of the larger ones, something in the manner of *Del. Hypoglossum.*

2. D. *sinuosa*, Lamour. *Sinuous-leaved Delesseria.* Stem elongated, branched, beset with oblong or obovate, dentato-sinuate or pinnatifid, transversely ribbed leaves. *Hook. Br. Fl. v.* ii. *p.* 285.—*Fucus sinuosus. E. Bot. t.* 822.

On the larger Fuci, very common; very fine at Larne; *Dr. Drummond. Fronds* 6—8 inches long or more, of a darker and duller colour than the preceding; the transverse veins much stronger.

3. D. *alata*, Lamour. *Winged Delesseria.* Stem excessively branched, somewhat dichotomous, winged with membrane, without distinct leaves; branches linear, attenuate; margin entire. *Hook. Br. Fl. v.* ii. *p.* 285. *E. Bot. t.* 1387.—*β. angustissima*, Turn. Frond extremely narrow, without any trace of lateral membrane. *Turn. t.* 160.

On the larger Algæ, very abundant. 4—8 inches high; deep red, excessively branched, very variable in the relative breadth of the membrane. Dr. Turner's var. β. is a very curious state of this plant, and has not yet (that I am aware) been found in Ireland.

4. D. *Hypoglossum*, Ag. *Proliferous Delesseria.* Frond (originally) linear-lanceolate, excessively branched ina proliferous manner; innovations lanceolate, attenuated and acute,

leaflike, rising from the midribs of the older leaves. *Hook. Br. Fl. v.* ii. *p.* 288. *E. Bot. t.* 1396.

On rocks and the larger Algæ, not rare; very fine at Bantry Bay; *Miss Hutchins.* And at Larne; *Dr. Drummond.* A beautiful species, distinguished by the lanceolate outline of its proliferous leaves; in other respects it approaches very near to the following.

5. D. *ruscifolia*, Lamour. *Ruscus-leaved Delesseria.* Frond (originally) linear, oblong, much branched in a proliferous manner; innovations or leaves oblong or obovate, obtuse, not tapered at base, rising from the midribs of the older fronds. *Hook. Br. Fl. v.* ii. *p.* 286. *Fucus ruscifolius, E. Bot. t.* 1397.

Rocks in the sea, rather rare. Bantry bay; *Miss Hutchins.* Miltown Malbay, Kilkee and Wicklow, &c.; *W. H. Harvey.* Differs from the last in being of rather a darker colour and less delicate substance, with short obtuse leaves; but this latter character is far from invariable.

37. NITOPHYLLUM. *Grev.* Nitophyllum.

Frond plane, delicately membranaceous, expanded, rose coloured, reticulated, wholly without veins, or with slight vague ones toward the base. *Fructification:* hemisphærical *capsules* imbedded in the substance of the frond, and ternate *granules* forming distinct scattered spots.—Name; a Latin and Greek hybrid, from *nitor*, to *shine*, and *φυλλον*, a *leaf.*

1. N. *ocellatum*, Grev. *Ocellated Nitophyllum.* Frond with rather a roundish outline, much branched in a dichotomous manner; segments linear, obtuse; spots of granules "in the segments." *Grev. Hook. Br. Fl. v.* ii. *p.* 287. *D. ocell. Grev. Crypt. t.* 347.

Rare. Bantry bay; *Miss Hutchins.* 4—6 inches long, generally cut into numerous linear segments. Though this species appears, at first sight, very distinct, if we regard only *typical* specimens (such as are figured in *Dr. Greville's* plate), yet I have seen so many varieties, bordering more or less on *N. punctatum*, that, I greatly fear, this must only be considered a curious variety of that species,

2. N. *punctatum*, Grev. *Spotted Nitophyllum.* Frond very thin and delicate, destitute of nervures, cleft into two or three principal segments, which are more or less cleft into numerous, narrow forked laciniæ; spots of granules scattered over the whole frond, large. *Hook. Br. Fl. v.* ii. *p.* 287. *Fucus punctatus. E. Bot. t.* 1575.—*Turn. Hist. t.* 71.

On various Algæ. Larne (*very fine*); *Dr. Drummond.* Bantry bay; *Miss Hutchins.* Miltown Malbay, and Kilkee; *W. H. Harvey.* 6—8 inches long, segments broad, cleft nearly to the base; spots of granules large and conspicuous.

3. N. *ulvoideum*, Hook. *Ulva-like Nitophyllum.* Frond thickish but tender, veinless, roundish but very irregular in

figure, somewhat cuneate at the base, variously cleft into oblong more or less broad segments, rounded at the extremity; spots of granules small, scattered over nearly the whole frond. *Grev. Hook. Br. Fl. v.* ii. *p.* 287. *N. Hilliæ. Grev. Crypt. t.* 351.—*F. ulvoides, Turn. t.* 80.—*E. Bot. t.* 2134.

Very rare. Bantry bay; *Miss Hutchins.* Distinguished by its broad slightly divided rounded fronds, thicker substance, and by the minute dot-like spots of granules. The "*Miltown Malbay*" station, given on my authority in the *British Flora*, is incorrect, and belongs to *N. Bonnemaisonii.*

4. N. *Bonnemaisonii*, Grev. *Bonnemaison's Nitophyllum.* Frond shortly stipitate, flabellate or palmate, variously cleft into numerous wedge-shaped segments, furnished near the base with irregular vanishing nerves; spots of granules scattered over the frond. *Hook. Br. Fl. v.* ii. *p.* 287.—*D. Bonnemaisonii. Grev. Crypt. t.* 322. *(excl. fig.* 2 *and* 3.*)*

Shores, rather rare. Bantry bay; *Miss Hutchins.* Larne; very fine; *Dr. Drummond.* Youghal; *Miss Ball.* Miltown Malbay and Kilkee; *W. H. Harvey.* Distinguished from *N. punctatum* by its elipitate palmato-flabellate frond; and from the following, by its different substance, and the position of the granular fructification.

5. N. *Gmelini*, Grev. *Marginal-fruited Nitophyllum.* Frond shortly stipitate, more or less flabellate, variously cleft into broadly wedge-shaped segments, waved, curled, and rather crisp, marked near the base with vague vanishing nerves; spots of granules linear, marginal. *Hook. Br. Fl. v.* ii. *p.* 288. *E. Bot. Suppl.*

In the sea. Bantry bay; *Miss Hutchins.* Larne; *Dr. Drummond.* Kilkee; *W. H. Harvey. Fronds* 2—4 inches long, roundish, when fresh curled and crisped, with a rather disagreeable smell and dark pink colour; when dry, delicately membranaceous.

6. N. *laceratum*, Grev. *Torn Nitophyllum.* Frond sessile, much divided in a dichotomous manner, veiny, segments mostly linear, variously cleft, waved at the margin; spots of granules oblong, either marginal or borne in distinct foliaceous marginal processes. *Hook. Br. Fl. v.* ii. *p.* 288.—*F. laceratus. Turn. Hist. t.* 68. *E. Bot. t.* 1067.

Common on rocks and Algæ. *Dr. Drummond's* specimens, gathered at Larne, near Belfast, are the largest and finest I have seen. The *veins* in this species are often very highly developed.

38. Rhodomenia. *Grev.* Rhodomenia.

Frond plane, membranaceous, fine pink or red, quite veinless, sessile, or with a short stem, which expands immediately into the frond. *Fruct.:* 1. hemisphærical, scattered *capsules;* 2. minute, ternate *granules*, spreading over the whole or some part of the frond, (not in distinct spots or sori.) *Grev.*

—Name; ῥοδος, *red*, and ὑμην, a *membrane*. This genus is distinguished from *Nitophyllum*, by the denser substance of the frond, and the general distribution of its granules through the whole, or irregular portions of the membrane.

1. R. *bifida*, Grev. *Bifid Rhodomenia.* Frond membranaceous, tender, thin, dichotomously divided from the base, segments broadly linear; apices subcuneate, bifid, obtuse; capsules chiefly confined to the margin. *Hook. Br. Fl. v.* ii. *p.* 289. *E. Bot. t.* 773.

On rocks, &c.; rare. Belfast; *Mr. Templeton.* Bantry bay; *Miss Hutchins.* Miltown Malbay, Kilkee and Wicklow; *W. H. Harvey.* 1—3 inches high, thin and delicate, fine rose-red. Mr. Turner's variety β. (which I have not found in Ireland) differs so much from the usual form, that it might easily be mistaken for a different species. It is of a darker colour, with exceedingly narrow segments, which are much lacerated and entangled.

2. R. *laciniata*, Grev. *Laciniated Rhodomenia.* Frond thickish, subcartilaginous, more or less palmate or flabelliform, cleft into numerous broad, wedge-shaped segments, which are again divided in a subdichotomous manner; apices obtuse; margin in fructification fringed with minute laciniæ, in which the capsules are imbedded. *Hook. Br. Fl. v.* ii. *p.* 289. *Turn. Hist. t.* 69. *E. Bot. t.* 1068.

Sea-shores, common. I have received superb specimens from Larne, near Belfast, through the kindness of Dr. Drummond. A fine species, 6—10 inches long, of a bright crimson colour.

3. R. *Palmetta*, Grev. *Fern-shaped Rhodomenia.* Stem short, cylindrical, quickly expanding into a roundish flabelliform frond, which is more or less cleft in a dichotomous manner, segments cuneate; axils rounded; apices (according to the state of fructification) either erose or rounded, obtuse; capsules mostly terminal; granules in the expanded apices. *Hook. Br. Fl. v.* ii. *p.* 290.—*F. Palmetta. Turn. t.* 73. *E. Bot. t.* 1120.

On rocks, or (more generally) on the stems of *Laminaria digitata*. *Fronds* tufted, about 3 inches high, very variable in the length of the stipes; tolerably constant in its other characters. *Substance* cartilaginous. *Colour*, a full rose-red. *Root* accompanied by creeping fibres.

4. R. *ciliata*, Grev. *Ciliated Rhodomenia.* Frond thick, subcartilaginous, rising from a short stipes, lanceolate, irregularly pinnated, with lanceolate or cleft segments, attenuated at base; margin (and often the disk) furnished with simple, subulate ciliæ, which bear the capsules at their extremities; granules in the disk; root fibrous, creeping. *Hook. Br. Fl. v.* ii. *p.* 291.—*Fucus ciliatus. E. Bot. t.* 1069.

On rocky shores, not uncommon. 4—8 inches high, of a thick substance, and full red colour, which becomes much darker in drying.

5. R. *jubata*, Grev. *Cirrhose Rhodomenia.* Frond thickish, flaccid, subcartilaginous, linear-lanceolate, much attenuate,

vaguely pinnated with segments of the same form; the margin (and often the disk) beset with subulate, often cirrhose ciliæ, in which both capsules and granules are produced; root fibrous, creeping. *Hook. Br. Fl. v.* ii. *p.* 291.—*Sp. jubatus. Grev. Crypt. t.* 359.

On rocky shores, in gravelly or shelly places. Bantry bay; *Miss Hutchins.* West of Clare, common; *W. H. Harvey.* The capsules, which are very rare, I was fortunate enough to gather in abundance at Miltown Malbay, in the summer of 1831. *Fronds* 4—8 inches high, dull pale red; ciliæ often 5—6 inches in length.

6. R. *palmata*, Grev. *Dulse or Dillisk.* Frond coriaceous or submembranaceous, broadly wedge-shaped, much and irregularly cleft, segments subdichotomously divided; margin entire (often winged with proliferous leaflets); granules distributed over the whole frond in cloud-like spots. *Hook. Br. Fl. v.* ii. *p.* 291.—*Fucus palmatus. E. Bot. t.* 1306.

Rocky shores, very abundant. *Fronds* 2—18 inches long, of a livid purple colour. Well known to hawkers and schoolboys under the name of *Dulse* or *Dillisk*; and eagerly collected by the poor on the coast as an agreeable esculent. It is similarly used in most of the northern countries of Europe.

7. R. *sobolifera*, Grev. *Proliferous Rhodomenia.* Frond membranaceous, shortly stipitate; stem filiform, dividing into branches, which expand into flat, dilated fronds, much deeply and irregularly cleft; the segments linear, wedge-shaped, laciniated at their apex. *Grev.—Hook. Br. Fl. v.* ii. *p.* 292. *Turn. Hist. t.* 45. *E. Bot. t.* 2133.

On *Laminaria digitata* and on rocks. Glenarm; *Dr. Drummond.* 4—6 inches long, cleft into many laciniated, linear, wedge-shaped segments. Very nearly related to *R. palmata*, from some varieties of which I find it sometimes dificult to distinguish it.

8. R. *reniformis*, Hook. *Kidney-shaped Rhodomenia.* Stipes short, cylindrical, simple or branched, suddenly expanding into a carnoso-membranaceous, roundish, subsimple or irregularly cleft (occasionally proliferous at the margin), somewhat lobed frond; capsules and granules scattered. *Hook. Br. Fl. v.* ii. *p.* 292.—*Iridæa reniformis, Bory. Grev. Alg. Brit.—Fucus reniformis. Turn. t.* 113. *E. Bot. t.* 2116.

Sea-shores, rather rare. Bantry bay; *Miss Hutchins.* Miltown Malbay and Kilkee; *W. H. Harvey.* Mouth of the river Bann; *Mr. D. Moore. Fronds* 2—8 inches long, fine red, soft, roundish, occasionally beset at the margin with proliferous lobes of similar form.

39. Plocamium. *Lamour.* Plocamium.

Frond filiform, compressed, between membranaceous and cartilaginous, fine pink red, much branched, branches distichous,

(alternately secund and pectinate.) *Fructification* of two kinds: sphærical sessile capsules, and lateral minute processes, containing oblong *granules*, transversely divided into several parts by pellucid lines. *Grev.* Name; πλοκαμος, *intertwined hair;* from the finely branched fronds. The exotic genus *Thamnophora, Ag. f. Grev.*, closely accords with the present in habit, and merely differs in the structure of the granules of the secondary fructification; a character, in my opinion, by no means sufficient to separate plants otherwise so nearly related.

1. P. *coccineum*, Lyngb. *Scarlet Plocamium. Grev. Alg. t.* 12. *Hook. Br. Fl. v.* ii. *p.* 293.—*Fucus coccineus. Turn. Hist. t.* 59. *E. Bot. t.* 1242.

Sea-shores, very common. *Fronds* 5—6 inches long, much branched, bright rose-colour; *ramuli* regularly alternately secund and pectinate.

40. Odonthalia. *Lyngb.* Odonthalia.

Frond plane, between membranaceous and cartilaginous, dark vinous-red, with an imperfect or obsolete midrib, alternately toothed at the margin. *Fruct.* marginal or axillary, or in the teeth; 1. Capsules, containing pear-shaped seeds, fixed by their base; 2. slender processes *(stichidia)*, containing ternate *granules. Grev.*—Name; οδους, οδοντος, a *tooth*, and θαλασση, the *sea;* a marine plant, with a *toothed* margin.

1. O. *dentata*, Lyngb. *Toothed Odonthalia.* Frond vaguely branched in an irregularly pinnate manner; branches linear-oblong, narrowed at base, alternately pinnatifid; laciniæ sharply toothed at the truncate extremities; capsules clustered on branched peduncles. *Hook. Br. Fl. v.* ii. *p.* 293.—*Fucus dentatus. E. Bot. t.* 1241.

Confined to our northern shores, where it is very common. *Fronds* 4—6 inches high, very dark.

41. Rhodomela. *Ag.* Rhodomela.

Frond cylindrical or compressed, filiform, much branched, coriaceo-cartilaginous (the apex sometimes involute.) *Fruct.:* subglobose capsules, containing free pear-shaped seeds, and pod-like receptacles, with imbedded ternate granules. *Grev.* Name; ροδος, *red*, and μελας, *black;* in allusion to the change the species undergo in drying, from red to blackish.

1. R. *Lycopodioides*, Ag. *Club-moss Rhodomela.* Frond elongate, mostly simple, beset with short, closely imbricated, slender, hair-like ramuli, which are generally forked near the apices. *Hook. Br. Fl. v.* ii. *p.* 294.—*Fucus Lycopodioides. Turn. Hist. t.* 10. *E. Bot. t.* 1163.

On our northern shores, rare. Antrim ; *Dr. Scott.* Portstewart ; *Mr. D. Moore.* 5—8 inches long, simple, shaggy, rope-like.

2. R. *subfusca*, Ag. *Brownish Rhodomela.* Frond filiform, much and irregularly branched ; branches subulate, pinnate, and alternate, often clustered. *Hook.—Hook. Br. Fl. v.* ii. *p.* 294. *Turn. Hist. t.* 10. *E. Bot. t.* 1164.

Bantry bay ; *Miss Hutchins.* Youghal ; *Miss Ball.* 4—8 inches high, much branched. *Branches* attenuate. *Colour* a dull reddish-brown. In the winter the branches are much broken, and quite destitute of the delicate ramuli which clothe them in summer.

3. R. *pinastroides*, Ag. *Pinaster-like Rhodomela.* Frond terete, irregularly branched ; branches with numerous secund, spuriously jointed ramuli ; apices incurved. *Hook. Br. Fl. v.* ii. *p.* 294.—*Fucus pin. Turn. t.* 11. *E. Bot. t.* 1042.

Sea-shores, not rare. Near Dublin ; *Dr. Scott.* Wicklow ; *W. H. Harvey.* Distinguished by its secund, spuriously jointed, incurved ramuli.

4. R. *scorpioides*, Ag. *Scorpion's-tail Rhodomela.* Frond cylindrical, slender, attenuated, three or four times pinnated, with horizontal branches, the uppermost involute at the extremity. *Hook. Br. Fl. v.* ii. *p.* 294.—*Fucus amphibius. Turn. t.* 109. *E. Bot. t.* 1428.

On rocks in the sea, salt marshes, &c. At Portstewart, North of Ireland ; *Mr. D. Moore.* *Fronds* 2—3 inches high, much branched in a distichous manner. *Branches* very patent, with involute apices. The *capsules* of this plant are a desideratum.

42. Bonnemaisonia. *Ag.* Bonnemaisonia.

Frond membranaceous, compressed or plane, filiform, much branched, the branches pectinate with distichous ciliæ. *Fruct.:* sessile or pedicellate capsules, containing a cluster of pyriform (compound ?) seeds, fixed by their base. *Grev.*— Named in honour of *M. Bonnemaison*, a French Algologist.

1. B. *arparagoides*, Ag. *Finely-branched Bonnemaisonia.* Frond compressed (or terete), excessively branched, filiform ; branches alternate, irregularly pinnated, set with alternate, subulate, distichous ciliæ ; capsules pedicellate, opposite the ciliæ. *Hook. Br. Fl. v.* ii. *p.* 295.—*Fucus asparag. Woodw. Turn. t.* 101. *E. Bot. t.* 571.—*β.* frond capillary, terete ; ciliæ very long.

Not rare in Ireland. Bantry ; *Miss Hutchins.* Near Belfast ; *Dr. Drummond.* Miltown Malbay ; *Joshua Fennell, Esq.* Kilkee, frequent ; *W. H. Harvey:* and var. *β.* at Kingstown, near Dublin, and Wicklow. One of the most beautiful of British Florideæ, of a fine rose red colour, and most delicately branched.

43. Laurencia. *Lamour.* Laurencia.

Frond cylindrical, filiform, between gelatinous and cartilaginous, mostly yellowish or purplish-red. *Fruct.* of two kinds: 1. ovate capsules with a terminal pore, containing a cluster of stalked, pear-shaped seeds, fixed by their base; 2. ternate *granules*, imbedded in the ramuli. *Grev.*—Named in compliment to a French Naturalist, M. de la Laurencie.

1. L. *pinnatifida*, Lamour. *Pinnatifid Laurencia.* Frond compressed, cartilaginous, bi-tripinnatifid, divisions alternate, ultimate ones obtuse, simple or lobed. *Hook. Br. Fl. v.* ii. *p.* 296.—*Fucus pinnatif. Turn. Hist. t.* 20. *E. Bot. t.* 1202.—*β. Osmunda;* frond flat, simple; ramuli short and multifid. *Turn. l. c.*—*γ. angusta;* frond roundish; branches multifid; ramuli terete, thickened upwards. *Turn. l. c.*

Rocky shores, very common. 1—10 inches high, dull purple.

2. L. *obtusa*, Lamour. *Obtuse Laurencia.* Frond cylindrical, filiform, 2—3 pinnate; pinnæ mostly opposite; ramuli short, patent, obtuse. *Hook. Br. Fl. v.* ii. *p.* 296.—*F. obtusa, Turn. t.* 21. *E. Bot. t.* 1201.

On the larger Algæ, rare. Ireland's Eye; *Mr. R. Ball.*

3. L. *dasyphylla*, Grev. *Thick-leaved Laurencia.* Frond filiform, terete, much branched, vaguely pinnated; branches long, subsimple, set with irregular, scattered or subfasciculate, obtuse ramuli, much attenuated at the base. *Hook. Br. Fl. v.* ii. *p.* 296.—*Fucus dasyphyllus. Turn. t.* 22. *E. Bot. t.* 847.

On sand-covered rocks and the larger Algæ, not rare. Bantry bay; *Miss Hutchins.* Coast of Clare; *W. H. Harvey. Colour* a pale pinky-brown.

4. L. *tenuissima*, Grev. *Slender Laurencia.* Frond filiform, much branched in a pinnated manner; ultimate branchlets short, setaceous and attenuated at the base. *Grev. Alg. Brit. t.* 113.—*Gigartina tenuiss. Lamour.*—*Chondria tenuiss. Ag. Sp. Alg. v.* i. *p.* 353. *Fucus tenuiss., Good. et Woodw. in Linn. Trans. v.* iii. *p.* 215. *t.* 19. *Turn. Syn. Fuc. p.* 35. *Hist. Fuc. t.* 100. *E. Bot. t.* 1882.

On rocks and on the larger Algæ. On the Coast of Waterford, near Ballycotton; *Miss Ball.* ☉. Summer.—6—8 inches high. Readily distinguished by its very slender, uniform, ultimate ramuli or pinnules.

44. Chylocladia. *Grev.* Chylocladia.

Frond cylindrical, filiform (often constricted as if jointed), between gelatinous and cartilaginous, of a pinky-red colour.

Fruct. of two kinds: 1. sphærical, ovate or conical capsules, with wedge-shaped or angular seeds; 2. imbedded, ternate granules.—Name; κυλος, *juice*, and κλαδος, a *branch*; from the succulent nature of the frond.

* *Frond without constrictions.*

1. C. *clavellosa*, Hook. *Clavellate Chylocladia.* Frond much branched in an irregular or somewhat pinnate manner; branches and ramuli alternate, distichous; ultimate ramuli often crowded, lanceolato-fusiform, attenuated at base. *Hook. Br. Fl. v.* ii. *p.* 297.—*Fucus clavell. Turn. t.* 30. *E. Bot. t.* 1283.

Sea-shores, rather rare. Bantry; *Miss Hutchins.* Kilkee; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.* Very variable in ramification, and best distinguished from our native species by its unconstricted frond and slender ramuli.

* * *Ramuli elliptical, rarely somewhat elongated and constricted.*

2. C. *ovalis*, Hook. *Oval-leaved Chylocladia.* Frond filiform, irregularly dichotomous, naked below, above beset with elliptical, simple (rarely elongated and constricted) ramuli tapering at the base; capsules sphærical, with a pellucid border. *Hook. Br. Fl. v.* ii. *p.* 297.—*Fucus ovalis. Turn. t.* 81. *E. Bot. t.* 711.

On rocks in the sea, not rare. 4—6 inches high, slightly branched, beset in the upper part with elliptical, rarely elongated *ramuli*, resembling the leaves of a *Sedum.*

* * * *Frond constricted as if jointed.*

3. C. *kaliformis*, Hook. *Salsola-like Chylocladia.* Frond subgelatinous, tubular, distantly constricted as if jointed, much and somewhat pinnatedly branched; branches whorled at the constrictions with catenulate ramuli; capsules sphærical, with a pellucid border. *Hook. Br. Fl. v.* ii. *p.* 298.—*Fucus kaliformis. Turn. t.* 29. *E. Bot. t.* 640.

Sea-shores; particularly fine in Bantry bay; *Miss Hutchins.*

4. C. *parvula*, Hook. *Least Chylocladia.* Frond subgelatinous, slender, irregularly branched in a subdichotomous, straggling manner; constrictions (throughout the frond) nearly equal in length and breadth; "capsules ovate, cantaining a sphærical mass of wedge-shaped seeds." *(Grev.)*—*Hook. Br. Fl. v.* ii. *p.* 298.—*Chondria parvula. Grev. Crypt. t.* 346.

Parasitic on the larger Algæ. Bantry; *Miss Hutchins.* Miltown Malbay; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.*

Surely very distinct from the preceding. I have received specimens from the Coast of North America, near New York, precisely agreeing with our Irish plant in every character.

5. C. *articulata*, Hook. *Articulated Chylocladia.* Frond tubular, membranaceo-gelatinous, strongly constricted throughout as if jointed, much branched in a fasciculato-dichotomous manner; branches patent; joints somewhat fusiform, much attenuated at base; "capsules urceolate." *(Grev.) Hook. Br. Fl. v.* ii. *p.* 298.—*Fucus articulatus. Turn. t.* 106. *E. Bot. t.* 1574.

On rocks and the larger Algæ, very common. *Fronds* 4—12 inches in length, dark-red, excessively branched in a dichotomous manner, and catenulato-constricted throughout.

45. GIGARTINA. *Lamour.* Gigartina.

Frond more or less cartilaginous, filiform, cylindrical or compressed, irregularly branched, of a dull-red colour. *Fruct.: capsules* containing a mass of minute roundish seeds, and (in many of the species, perhaps in all,) roundish or oblong simple granules, imbedded in the fronds of distinct plants. *Grev. Hook.*—Name, from γιγαρτον, a *grape stone*, which the seeds somewhat resemble, as seen through the capsule. (!) *Hook.*

1. G. *purpurascens*, Lamour. *Purplish Gigartina.* Frond cylindrical, filiform, bushy, excessively and very irregularly branched; ramuli setaceous, acute, scattered, containing immersed sphærical tubercles. *Hook. Br. Fl. v.* ii. *p.* 299.—*Fucus purpur. Turn. t.* 9. *E. Bot. t.* 1243.—*Gracilaria purp., Grev. Alg. p.* 122.

Rocky shores, very common.

2. G. *confervoides*, Lamour. *Conferva-like Gigartina.* Frond cartilaginous, cylindrical, filiform, irregularly (often very slightly) branched; branches long, subsimple; ramuli scattered, attenuated at each end; capsules external, roundish, scattered. *Hook. Br. Fl. v.* ii. *p.* 299.—*Fucus conf. Turn. t.* 84. *E. Bot. t.* 1668.—*Gracilaria conf. Grev.*

Sea-shores, not rare. Bantry; *Miss Hutchins.* Miltown Malbay, and near Dublin; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.*

3. G. *erecta. Small upright Gigartina.* Frond cylindrical, dichotomous, erect; branches subsimple; capsules globose; granules in terminal pod-like ramuli. *Hook. Br. Fl. v.* ii. *p.* 300. —*Gracilaria erecta. Grev. Alg. Brit. p.* 124. *t.* 14. *Sphærococcus? erectus, Grev. Crypt. Fl. t.* 357.

Sand-covered rocks. Bangor, County of Down; *W. Thompson, Esq.* ♃. February, March. It is slender, erect, rigid, 2—4 inches

high, and bears, besides the true capsules, lanceolate pod-like receptacles, containing oblong and scattered granules imbedded in the circumference.

4. G. *acicularis*, Lamour. *Acicular Gigartina.* Frond cartilaginous, terete, filiform, irregularly branched, subdichotomous; branches divaricate; ramuli few, scattered, very patent, subulate; capsules large, sphærical, scattered. *Hook. Br. Fl. v.* ii. *p.* 300.—*Fucus acic. Turn. t.* 126. *E. Bot. t.* 2190.

Very rare. Belfast; *Mr. Templeton.*

5. G. *Griffithsiæ*, Grev. *Mrs. Griffiths' Gigartina.* Frond cartilaginous, filiform, dichotomous, subsimple below, much branched above; branches fastigiate; axils patent; fructification oblong, warts composed of moniliform filaments, and surrounding the stem. *Hook. Br. Fl. v. ii. p.* 301.—*Fucus Griffithsiæ. Turn. t.* 37. *E. Bot. t.* 1926.

Rather rare. Bantry; *Miss Hutchins.* Balbriggan; *Dr. Scott.* Dark-red, rigid, entangled, 2—4 inches high.

6. G. *plicata*, Lamour. *Entangled Gigartina.* Frond horny, cylindrical, filiform, very irregularly branched, entangled, wiry; branches subdichotomous; the axillæ obtuse; ramuli often secund; "fructification oblong, irregular; warts composed of obscurely articulated filaments." *(Grev.) Hook. Br. Fl. v.* ii. *p.* 301.—*Fucus plicatus. Turn. t.* 180. *E. Bot. t.* 1089.

Rocky shores, common. 4—8 inches high, remarkably wiry and entangled.

46. Chondrus. *Stackh.* Chondrus.

Frond cartilaginous, dilating upwards into flat, nerveless, dichotomously divided segments, of a purplish or reddish colour. *Fruct.:* subsphærical capsules, in the substance of the frond (rarely supported on little stalks), containing a mass of minute free *seeds. (Grev.)*—Name; χονδρος, *cartilage;* in allusion to the substance of the frond.

1. C. *mammillosus*, Grev. *Mammillated Chondrus.* Frond thick, cartilaginous, irregularly dichotomous, proliferous, channelled, segments oblong-cuneiform, bifid; capsules borne on short peduncles scattered over the disk. *Hook. Br. Fl. v.* ii. *p.* 302.—*Fucus mammill. Turn. Hist. t.* 218. *E. Bot. t.* 1054.

Rocky shores, very common.

2. C. *crispus*, Lyngb. *Curled Chondrus.* Frond thickish, cartilaginous, dichotomous, flat or curled, quite plane (without channel); segments very variable in breadth, subcuneate; capsules hæmispherical, innate in the disk, concave at one side. *Hook. Br. Fl. v.* ii. *p.* 302.—*F. crispus, Turn. Hist. t.* 216 and 217. *E. Bot. t.* 2285.

Rocky shores, common. Very variable in size, shape, and colour, (often of a full green); yet the accustomed eye will find little difficulty in recognising it under all its varieties. On our western shores it is collected in large quantities by poor women and children, and sold under the name of *Blanc-mange-weed*, (or, as they pronounce it, *Bullamonge.*) At one time it sold in Dublin at two shillings per pound, but latterly the price has greatly fallen away. It may now be bought, washed and dried, on the west of the County of Clare, at from one shilling to one shilling and six pence per *stone*, of sixteen pounds.

3. C. *Norvegicus*, Lyngb. *Norway Chondrus.* Frond cartilagineo-membranaceous, dichotomous, plane; axils patent; segments nearly linear; the apices obtuse; capsules sphærical, sessile on the disk. *Grev. Alg. Brit. Lyngb. Dan. p.* 16.—*Fucus Norv. Turn. Hist. t.* 41. *E. Bot. t.* 1080.

Rocky shores, rare. Bantry; *Miss Hutchins.* Youghal; *Miss Ball.* Miltown Malbay; *W. H. Harvey. Fronds* 2—3 inches high, purplish-red, thinner than those of *C. crispus.* This species is omitted by mistake in Dr. Hooker's British Flora.

4. C. *membranifolius*, Grev. *Membranous-leaved Chondrus.* Stipes cylindrical, filiform, branched; the branches expanding into subcuneate, membranaceo-cartilaginous, two-lobed or dichotomous segments; capsules ovate, shortly pedunculated, arising from the stipes. *Hook. Br. Fl. v.* ii. *p.* 302.—*Fucus memb. Turn. Hist. t.* 74. *E. Bot. t.* 1965.

Rocky shores, not uncommon. Youghal; *Miss Ball.*

5. C. *Brodiæi*, Grev. *Mr. Brodie's Chondrus.* Stipes cylindrical, branched; the branches expanding into oblong, membranaceo-cartilaginous, simple or forked, flat segments; capsules sphærical, sessile upon the apices of the segments. *Grev. Alg. Brit. p.* 133.—*Sphærococcus Brodiæi, Lamour.—Fucus Brodiæi, Turn. Hist. Fuc. t.* 72. *E. Bot. t.* 1966.

Found only among rejectamenta on our northern shores. Mouth of the river Bann, County of Derry; *Mr. D. Moore.* Larne, County of Antrim; *Dr. Drummond.* Strangford Lough, County of Down; *Mr. W. Thompson.*

47. PHYLLOPHORA. *Grev.* Phyllophora.

Frond cartilaginous or membranaceous, of a purple rose-red colour, plane, proliferous from the disk, furnished with a more or less imperfect or obscure midrib. *Fruct.:* 1. *Capsules*, containing a mass of minute, roundish, free seeds; 2. *Sori* of simple *granules*, in little foliaceous processes. *Grev.*—Name; φυλλον, a *leaf*, and φορεω, *to bear*; the frond being proliferous.

1. P. *rubens*, Grev. *Red Phyllophora.* Stipes very short, expanding into a sublinear, obscurely ribbed frond, which is repeatedly branched in a proliferous manner; innovations re-

sembling the primary frond; capsules sessile, wrinkled. *Hook. Br. Fl. v.* ii. *p.* 303.—*Fucus rubens, Linn. Turn. Hist. t.* 12. *E. Bot. t.* 1053.

Rocky shores, not uncommon. Belfast; *Dr. Drummond.* West of Ireland, very common, where it reaches a large size. *Fronds* 2—8 inches long, of a dull full red colour.

48. Sphærococcus. *Stackh.* Sphærococcus.

Frond cartilaginous, compressed, two-edged, linear, distichously branched. *Fruct.:* mucronate capsules, containing a mass of ovate, shortly pedicellate, red seeds. *Grev.*—Name; *σφαιρα*, a *sphere* or *globe*, and *κοκκος*, *fruit*; the capsules are globose.

1. S. *coronopifolius*, Ag. *Swine's-cress leaved Sphærococcus.* Frond cartilaginous, much branched in a distichous and alternate manner, compressed and two-edged below, nearly flat upwards; the branches acute at the apex; capsules sphærical, mucronate in little stalks fringing the smaller branches. *Grev. Hook. Br. Fl. v.* ii. *p.* 304.—*Fucus coron. Turn. Hist. t.* 122. *E. Bot. t.* 1478.

Sea-shores, not rare. Bantry; *Miss Hutchins.* Belfast; *Mr. Templeton* and *Dr. Drummond.* Miltown Malbay; *W. H. Harvey.* 4—8 inches long, bright red, becoming darker in drying.

49. Gelidium. *Lamour.* Gelidium.

Frond between cartilaginous and horny, compressed, linear, more or less regularly pinnated. *Fruct.:* 1. *Capsules*, imbedded in the substance of the ramuli, containing a mass of minute roundish *seeds*; 2. ternate or otherwise compound *granules* in the ramuli, on distinct individuals. *Grev.*—Name, in allusion to the gelatinous nature of some species when macerated.

1. G. *corneum*, Lamour. *Horny Gelidium.* Frond between cartilaginous and horny, nearly flat; distichously branched; branches linear, attenuated at each end, pinnate and bipinnate; pinnules mostly opposite, patent, obtuse, bearing within their apices elliptical capsules. *Grev. Hook.—Hook. Br. Fl. v.* ii. *p.* 305.—*Fucus corneus, Turn. Hist. t.* 257. *E. Bot. t.* 1970.

Rocky coasts, everywhere. A most variable plant, of which fifteen distinct varieties are enumerated as natives of our shores. The most remarkable of these is the var. *latifolium* of Dr. Greville, which is not uncommon at Miltown Malbay. In this the main *stem* is very broad, (1—2 lines,) quite flat, and more or less bipinnate; the ultimate *pinnulæ* very short; *colour* a bright rose-red.

50. Ptilota. *Ag.* Ptilota.

Frond compressed or flat, pectinato-pinnate, of a red colour, between membranaceous and cartilaginous. *Fruct.:* minute, aggregated *capsules*, surrounded by an involucre. *Grev.*—Name; πτιλωτος, *pinnated;* from the delicately pinnated fronds.

1. P. *plumosa*, Ag. *Feathered Ptilota.* Frond compressed, filiform, much branched; the branches repeatedly pectinato-pinnate; pinnæ and pinnulæ exactly opposite; the latter minute, subulate, and bearing the clustered capsules. *Hook. Br. Fl. v.* ii. *p.* 307.—*Fucus plumosus. Turn. Hist. t.* 60. *E. Bot. t.* 1308.—*β. capillaris;* frond very narrow, flaccid; ramuli jointed. *Turn. l. c.*

Rocky shores. *α.* on the stalks of the larger Algæ. *β.* on the faces of perpendicular rocks. 6—18 inches long, many times pinnated, of a full red or brownish colour, (in *β.*)

Tribe XIII. CERAMIEÆ.

Plants marine (except some species of Trentepohlia), of a red, purple or reddish-brown, rarely brown colour, staining fresh water with more or less of a red hue, of a cartilaginous or membranaceous substance and cellular texture. Frond filamentous, cylindrical or compressed, articulate. Fructification double: 1. *Capsules, containing a mass of seeds;* 2. *granules, contained in proper receptacles or in distorted ramuli.*

51. Polysiphonia. *Grev.* Polysiphonia.

Frond filamentous, partially or generally articulate; the articulations longitudinally striate, with internal parallel tubes. *Fruit* double: 1. ovate capsules, furnished with a terminal pore, and containing pyriform seeds; 2. *granules*, immersed in swollen ramuli.—Name; πολος, *many*, and σιφων, a *tube;* from the structure of the frond.—The species of this genus are numerous, and very difficult of determination; and I freely confess, that I by no means fully understand all our native ones. Many new ones will, doubtless, be discovered on our shores by future observers, (for our rich coasts have been but very imperfectly explored); and *some*, which I even possess in my Herbarium, I have feared to introduce, until I can have better opportunities of tracing them in their places of growth.

A. *Main filaments inarticulate.*

1. P. *fruticulosa*, Grev. *Shrubby Polysiphonia.* Stems diffuse, branched from the base; branches divaricating, pinnato-dichotomous, much divided, inarticulate, set in the lower part with short, horizontal, multifid ramuli; in the upper more or less distinctly pinnate, with larger, similarly divided branchlets; axils rounded; articulations of the ramuli shorter than broad; dissepiments opaque; veins anastomosing. *Hutchinsia Wulfenii, Ag. Sp. Alg. v.* ii. *p.* 95.—*Fucus frutic. Turn. Hist. t.* 227. *E. Bot. t.* 1686. *P. fruticulosa. Harv. in Hook. Br. Fl. v.* ii. *p.* 327. *(in part.)*

Bantry bay; *Miss Hutchins.* Black rocks, Portrush; *Mr. D. Moore.* In the *British Flora* I confounded the two following under this species, and the "*Miltown Malbay*" station, given in that work, belongs to *P. thuyoides.* The true *P. fruticulosa* is readily distinguished by its *diffuse* growth, different ramification, and by the *horizontal multifid ramuli* which clothe the stems.

2. P. *thuyoides*, Harv. MSS. *Arbor-Vitæ Polysiphonia.* Stems tufted, rising from creeping filaments, erect, terete; below simple, and set with short spine-like ramuli; above, much and fasciculately branched; branches crowded round the apices, very erect, bipinnate; pinnæ pinnato-multifid; axils rounded; articulations of the ramuli shorter than broad; dissepiments opaque; veins anastomosing. *P. fruticulosa, Harv. in Hook. Br. Fl. l. c. (in part.)*

Rocky shores. Very abundant at Miltown Malbay. Portrush bay; *Mr. D. Moore.* 3—4 inches high, dull brown. *Capsules* very rare. *Granules* and *antheridia* very frequently produced. The habit of this is very different from that of the preceding; indeed, at first sight, it might readily be mistaken for *P. nigrescens*, a plant of a totally different structure. I am not aware that it has been previously described.

3. P. *cristata*, Harv. MSS. *Crested Polysiphonia.* Stem erect, compressed, subsimple below, decomposite above; branches erecto-patent, more or less regularly bipinnate (as is also the stem to the base); lower pinnæ very short, their pinnules simple and broadly subulate; upper longer, with pinnato-multifid pinnules; axils all acute; ramuli, as well as branches, inarticulate, reticulated with veins. *Fucus cristatus.*—γ. *Miss Hutchins in Herb. (not of Turner.)*

Very rare. Bantry bay; *Miss Hutchins.* If specimens, which I possess through the kindness of Dr. Hooker, be correctly named, (which I have no reason to doubt,) this is not the var. γ. of Turner's *Fucus cristatus (Rhodomenia cristata, Grev.)*; and, consequently, not the *Rytiphlæa complanata* of Agardh. Indeed, if the genus *Rytiphlæa* be characterized by a transversely striate frond, this has no claims to admission into it. This species is alluded to in the British Flora, under *P. fruticulosa*, as a beautiful variety of that species, found at *Whitsand* bay by Mr. Walter Arnott.

4. P. *Brodiæi*, Grev. *Brodie's Polysiphonia.* Stems continuous, cartilaginous, alternately branched; branches pinnated with spreading pencillato-multifid, delicate, flaccid ramuli; articulations of the ramuli 3—4 tubed, rather longer than broad; dissepiments hyaline. *Harv. in Hook. Br. Fl. v.* ii. *p.* 328.—*Conf. Brodiæi. Dillw. t.* 107. *E. Bot. t.* 2589.

Rocky shores; common on our western coasts.

5. P. *Lyngbyei*, Harv. *Lyngbye's Polysiphonia.* Filaments thick, cartilaginous, inarticulate, distantly and irregularly branched, more or less furnished with long, slender, irregularly dichotomous ramuli with acute axillæ; articulations of the ramuli 2—4 times longer than broad, bi-tri-striated. *Harv. in Hook. Br. Fl. v.* ii. *p.* 328.—*Hutch. strictoides. Lyngb. Hyd. Dan. t.* 35.

At Rosse's bay, North of Ireland; *Mr. D. Moore.* 6—12 inches high. *Filaments* as thick as those of *P. elongata*, inarticulate, marked with flexuose veins, dull red. *Ramuli* long, bright crimson, few in the winter state, but, as spring advances, abundantly clothing the upper branches, and spreading in broad fascicles. To *P. elongata* this species bears a very strong external resemblance, but the *inarticulate* stems, and the *long-jointed bistriated* ramuli, which are, moreover, not in the least attenuated at the base, will always serve to keep it distinct.

B. *Filaments articulate throughout.*

* *Articulations marked with two striæ.*

6. P. *fibrata*, Harv. *Bearded Polysiphonia.* Filaments elongated, setaceous, gelatinous, bi-striated, flexuose, loosely branched; ramuli dichotomous, fasciculate; axils patent; upper articulations 2—3 times longer than broad; capsules ovate, pedunculate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 329.—*Conf. fibrata. Dillw.*

Rocky shores. Bantry; *Miss Hutchins.* Malbay; *W. H. Harvey.* Portrush, black rocks; *Mr. D. Moore.* 2—10 inches long, very delicate, flaccid and gelatinous, forming loose tufts. *Articulations* very variable in length.

7. P. *stricta*, Grev. *Straight Polysiphonia.* Filaments densely cæspitose, setaceous, flaccid, bistriate, dichotomous; branches and ramuli straight, erect; axils acute; upper articulations 4—5 times longer than broad; capsules ovate, sessile. *Harv. in Hook. Br. Fl. v.* ii. *p.* 329.—*Conf. stricta, Dillw. t.* 40.

Rocky shores. Bantry; *Miss Hutchins.* Black rocks, Portrush; *Mr. D. Moore.* A very confused species, which I regret I have no opportunities at present of clearing up. Many distinct species appear to be confounded under this name, both by authors and herbarists.

8. P. *macrocarpa*, Harv. MSS. *Large-fruited Polysiphonia.*

Filaments rising from a mass of creeping fibres, tufted and interwoven, short, very slender, flexuose, sparingly and irregularly dichotomous, more or less furnished with very patent or recurved simple ramuli; articulations variable in length, bi-striate; capsules urceolate, very large (in proportion to the diameter of the filament), scattered.

On rocks and Algæ in the sea; probably not uncommon. At Portstewart; *Mr. D. Moore*. Miltown Malbay; *W. H. Harvey*. *Tufts* dense, intricate, about an inch in height, composed of very slender, capillary, flexuose filaments, brownish-red. I have long known this species on the western coast, but have hitherto feared to introduce it. It resembles *P. urceolata* or *P. patens* in miniature, but is of a very flaccid substance, and not one-fourth the size of either of those species; and is, moreover, well distinguished by the very large size of the capsule in proportion to the diameter of the filament. Like *P. stricta*, and several exotic species, the stems rise from a mass of interwoven fibres.

9. P. *urceolata*, Grev. *Pitcher-fruited Polysiphonia.* Filaments rigid, cartilaginous, much branched, loosely entangled; branches dichotomous, erecto-patent; middle articulations 4—5 times longer than broad; capsules with a produced contracted neck, shortly pedunculate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 330. —*Conf. urceolata, E. Bot. t.* 2365.

On rocks and the larger Algæ. Closely allied to the following, from which it chiefly differs in its less squarrose ramification.

10. P. *patens*, Grev. *Patent Polysiphonia.* Filaments cartilaginous, sparingly branched, entangled, beset with short, patent, recurved ramuli, bistriate; middle articulations 2—3 times longer than broad; capsules with a short contracted neck, subsessile. *Harv. in Hook. Br. Fl. v.* ii. *p.* 330.—*Conf. patens? Dillw. Hutchinsia urceolata, Lyngb. Hydroph. Dan. t.* 34. *(excellent.)*

On the stems of *Laminaria digitata*, common. *Stems* subsimple, entangled, dull red. *Ramuli* revolute.

* * *Articulations multistriate.*

† *Rigid; striæ* 3, *ramuli spinæform.*

11. P. *parasitica*, Grev. *Parasitic Polysiphonia.* Filaments slender, rigid; branches alternate, distichous, bi-tripinnate; pinnulæ alternate, erect, spinæform; articulations as long as broad, three tubed. *Harv. in Hook. Br. Fl. v.* ii. *p.* 330.—*Conf. parasitica, E. Bot. t.* 1429.

On the larger Algæ and on rocks, not uncommon. Bantry bay; *Miss Hutchins*. Kilkee; and under "the Black Castle," Wicklow, very fine. 1—2 inches high, full red, slender; delicately and beautifully bipinnate.

†† *Rigid; dark-red or brown, striæ numerous.*

12. P. *atro-rubescens*, Grev. *Dark-red Polysiphonia.* Filaments sparingly branched, somewhat rigid; branches very erect, beset with short, subfasciculate or scattered subulate ramuli; articulations variable; lower, twice or thrice, upper once and half as long as broad, multi-striate; capsules ovate, pedunculate or sessile. *Harv. in Hook. Br. Fl. v.* ii. *p.* 331.—*Conf. atro-rubescens, Dillw. t.* 70.—*C. nigra, E. Bot. t.* 2340. *P. Agardhiana, Grev. Crypt. t.* 210. *and Harv. l. c.—P. badia, Grev. Harv. l. c.; and P. denudata, Grev. Harv. l. c. p.* 332.

Rocky shores; not uncommon. 2—6 inches high, dark red, densely tufted. With the consent of my friend, Dr. Greville, I gladly refer his *P. Agardhiana* to this species; and I feel no hesitation in adopting a similar course with *P. badia* and *denudata.*

13. P. *violacea*, Grev. *Purple Polysiphonia.* Filaments flaccid, much and fasciculately branched upwards; branches subdichotomous, patent; ramuli scattered, elongate, subsimple; middle articulations 3—4 times, upper twice as long as broad; capsules shortly pedicellate, subovate. *Hook. Br. Fl. v.* ii. *p.* 332.—*Hutchinsia violacea, Ag. Sp. Alg. v.* ii. *p.* 76. *Lyngb. Hydroph. Dan. t.* 356. *(excl. fig. a.)*

Found among rejectamenta on the strand near Ballymacarret, April 10th, 1836; *Dr. Drummond.* Sparingly branched at the base, much and fasciculately branched upwards; *branches* long, patent, subdichotomous, the secondary ones very erect, almost appressed, with roundish axillæ. *Ramuli* elongated, virgate, straight, simple, or with a few ramular processes near the apex, often fibrilose. *Articulations* 5—7 striæ, the basal ones very short, but rapidly elongating. *Colour* a dull red. *Substance* flaccid, adhering to paper.—Doctor Drummond's specimens are from 6—10 inches long, but destitute of fruit, which is described by Dr. Hooker as being shortly pedicellate, ovate or subturceolate, with an elongated but not contracted neck; scattered over the ramuli.

14. P. *nigrescens*, Grev. *Dark Polysiphonia.* Filaments robust, rigid below, much branched and bushy; upper branches somewhat pinnate with distichous, subulate ramuli, which are mostly ramulose toward their apices; lower articulations very short, upper rather longer than broad; capsules ovate, sessile. *Harv. in Hook. Br. Fl. v.* ii. *p.* 332.—*Conf. fucoides, Dillw. t.* 75. *E. Bot. t.* 1743—*Conf. nigrescens, E. Bot. t.* 1717.

Rocky shores, common. A very variable plant, and, perhaps, more than one species is confounded under this name. Mrs. Griffiths has communicated a beautiful *variety (?)*, from Larderham, which she is inclined to consider a distinct species; and I gathered a similar plant at the Black Castle, Wicklow. In this all the *branches* are perfectly distichous and remarkably patent, the *stem* is subcompressed, and the whole plant has a decomposito-pinnate character. Future observations may prove it truly distinct.

15. P. *fastigiata*, Grev. *Fastigiate Polysiphonia.* Filaments rigid, setaceous, equal, many times dichotomous, fastigiate; axils patent; articulations shorter than their diameter, multistriate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 333.—*Conf. polymorpha. Dillw. t.* 44. *E. Bot. t.* 1764.

Parasitic on *Fucus nodosus* and *F. vesiculosus*, very common. Dark brown, rigid, forming round bushy tufts.

††† *Stems rigid, cartilaginous; ramuli flaccid, delicate.*

16. P. *elongata*, Grev. *Lobster-horn Polysiphonia.* Stems robust, cartilaginous, irregularly branched, beset, especially toward the apex, with slender, broadly fasciculate ramuli, attenuated at the base; articulations about as long as broad, those of the stem reticulated with veins. *Harv. l. c.—Conf. elongata, Dillw. t.* 38. *E. Bot. t.* 2429.

Sea-shores, common. The largest of our native species, with very robust stems. It varies both in the ramification, and in the more or less crowded ramuli (in some varieties they are entirely wanting); yet the student will readily recognise it under all its appearances. The *stems* are of a dull red colour; the *ramuli* are brilliant crimson.

17. P. *byssoides*, Grev. *Byssoid Polysiphonia.* Filaments cartilaginous, alternately branched; branches decomposito-pinnate, patent, crowded; ramuli short, squarrose, capillary, multifid, single-tubed; articulations of the stem 3—4 striate, 2—4 times as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 334. *Conf. byssoides, Dillw. t.* 58. *E. Bot. t.* 547.

Bantry bay; *Miss Hutchins.* Very common on our eastern and rare on our western shores. A delicate species, fine red when quite recent, but rapidly changing to a dull brown in fresh water, or on exposure to the air. It is easily distinguished from all our native species by its *single-tubed ramuli*: indeed this character, together with its peculiar *habit*, would lead one to suspect that it belonged more properly to *Dasya* than *Polysiphonia*, but it does not produce the *stichidia* peculiar to that genus.

52. Dasya. *Ag.* Dasya.

Frond filamentous; main filaments inarticulate, cartilaginous, beset with articulated, penicellate or pinnate, single-tubed ramuli. *Fructification* double: 1. coriaceo-acuminate capsules, furnished with a terminal pore, and containing pear-shaped seeds: 2. lanceolate *receptacles (stichidia)*, containing granules set in transverse fascia.—Name; δασυς, *hairy*; in allusion to the slender ramuli.

1. D. *coccinea*, Ag. *Scarlet Dasya.* Stems elongated, robust, irregularly branched; branches bipinnate; pinnulæ fasciculato-multifid; articulations of the ramuli as long as broad.

Harv. in Hook. Br. Fl. v. ii. *p.* 335.—*Conf. coccinea, Dillw. t.* 36. *E. Bot. t.* 1055.

Sea-shores, common. 6—8 inches high, bright red, and beautifully pinnate. *Stems* thick, densely villose.

2. D. *ocellata*, Harv. *Ocellated Dasya.* Stems short, slender, subsimple, beset on all sides with long, erecto-patent, dichotomous, penicellate ramuli; articulations 3—4 times longer than broad; receptacles lanceolate, attenuate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 335.—*Cer. ocellatum, Grateloup.—D. simpliciuscula, Ag. Sp. v.* ii. *p.* 122.

Very rare. Black Castle, Wicklow; *W. H. Harvey.*

3. D. *Hutchinsiæ*, Harv. *Miss Hutchins' Dasya.* Stems short, slender, much and irregularly branched, beset on all sides with very short, divaricating, dichotomous ramuli; articulations about twice as long as broad; receptacles oblong, suddenly acuminate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 335.—*Conf. Arbuscula, Dillw. t. G. (excl. t.* 85.*)*

Rocky shores, not uncommon. Bantry bay; *Miss Hutchins.* Miltown Malbay; Kingstown Harbour; Killiney, and Wicklow; *W. H. Harvey.* Arran; *Mr. R. Ball. Stems* tufted, 2—4 inches high, much branched, and well distinguished from the preceding by the form of its receptacles. As stated in the British Flora, this species was once confounded with the very different *Callithamnion Arbuscula;* and Dillwynn figure, (*t.* G.) which represents its fruit, being referred by him to the latter species, has caused no small perplexity to botanists imperfectly acquainted with either.

53. Ceramium. *Adans. Roth.* Ceramium.

Frond filamentous: *filaments* articulated, mostly dichotomously branched, reticulated with veins; dissepiments opaque. *Fructification* double: 1. *Capsules* with a membranaceous pericarp, containing numerous angular *seeds;* 2. simple oblong *granules*, imbedded in the ramuli.—Name; κεραμος, a *little pitcher;* from the form of the capsules; but as the genus now stands, the resemblance is not striking.

1. C. *rubrum*, Ag. *Red Ceramium.* Filaments cartilaginous, irregularly branched, toruloso-contracted at the dissepiments; articulations coloured, reticulated with veins. *Harv. in Hook. Br. Fl. v.* ii. *p.* 336.—*Conf. rubra, Dillw. t.* 34. *E. Bot. t.* 1166.

On rocks and Algæ, very common.

2. C. *diaphanum*, Roth. *Variegated Ceramium.* Filaments thickish, irregularly branched, set with lateral, slender, dichotomous ramuli; dissepiments swollen, opaque; articulations hyaline, those of the principal stems 3—4 times as long as broad, of the ramuli very short. *Harv. in Hook. Br. Fl. v.* ii.

p. 336.—*Conf. diaphana, Dillw. t.* 38. *E. Bot. t.* 1742. *Cer. rubrum, diaphanous var. Wyatt. Alg. Danm. No.* 87.

Sea-shore, on various Algæ, common.

3. C. *fastigiatum,* Harv. MSS. *Fastigiate Ceramium.* Filaments capillary, equal throughout, dichotomous, level-topped; dissepiments opaque; lower articulations hyaline, 3—4 times longer than broad, upper coloured, short. *Conf. fastigiata, Roth. Cal.* 2. *p.* 225.?? *Cer. diaphanum, β. arachnoides, Ag. Sp. v.* ii. *p.* 152. *Cer. diaphanum, Wyatt. Alg. Danm. No.* 86.

Sea-shores. At the instance of my valued friend, Mrs. Griffiths, I have ventured to separate this species from *C. diaphanum,* with which all previous authors have confounded it. It has, however, a very different habit and ramification, and is, at least, as distinct as some other species of the genus. Mrs. Griffiths has so well pointed out, in a letter to me, the characters which peculiarly distinguish it from *C. diaphanum,* that I cannot do better than quote her words: "Pray observe that *C. fastigiatum* has no *principal* stem or branches; that it is uniformly and constantly dichotomous and level-topped, and that the threads of which the tuft is composed are of an equal diameter from the base to the summit; and this holds good in plants from all parts of the coast. Now *C. diaphanum* has a principal stem and branches, divides irregularly, almost distichously, the extremities almost fan-shaped, and very unequal at the top; the joints are also more distant and irregular." *Mrs. G. in litt.*

4. C. *ciliatum,* Ducluz. *Spiny Ceramium.* Filaments rigid, dichotomous, fragile; articulations hyaline; joints furnished with whorled or solitary prickles; apices remarkably involute. *Harv. in Hook. Br. Fl. v.* ii. p. 336.—*Conf. ciliata, Dillw. t.* 53. *E. Bot. t.* 2428.

On rocks, corallines, &c. A very variable plant, both in general appearance and in the nature and number of the prickles; and, perhaps, future observations may show the propriety of resolving it into several species. But without a careful examination of specimens from all parts of the coast, such a proceeding would, in all probability, serve no other purpose than that of burdening the science with useless synonyms.

54. Griffithsia. *Ag.* Griffithsia.

Frond filamentous; *filaments* articulated throughout, mostly dichotomous; ramuli single-tubed, often whorled; dissepiments hyaline. *Fructification* double: 1. clustered *capsules* with hyaline pericarps; 2. roundish, gelatinous, involucrated *receptacles (flavellæ),* including minute *granules.*—Named by Agardh, in honour of Mrs. Griffiths of Torquay, a most acute and indefatigable Algologist, to whose exertions the British Flora stands indebted for many of its most beautiful species.

1. G. *equisetifolia,* Ag. *Equisetum-like Griffithsia.* Fila-

ments robust, cartilaginous, whorled throughout with imbricated, incurved, many times dichotomous ramuli. *Harv. in Hook. Br. Fl. v.* ii. *p.* 337.—*Conf. equisetif. Dillw. t.* 54.—*E. Bot. t.* 1479.

On our western shores, common. *Stems* 6—12 inches high, very robust and much branched. *Branches* tapering to a point. *Fructification* imperfectly known.

2. G. *simplicifilum*, Ag. *Slender Equisetum-like Griffithsia.* Filaments slender, irregularly branched, whorled with imbricated, straight, once-forked ramuli. *Ag. Sp. Alg. v.* ii. *p.* 134.

At Ardinairy Point, County of Wicklow, among rejectamenta; and growing very sparingly on rocks underneath Black Castle, Wicklow; *W. H. Harvey.* 4—8 inches high, slender, (compared with *G. equisetifolia*,) much branched. *Branches* long, mostly simple, the smaller ones often bare of ramuli, the larger closely whorled with *straight* branchlets forked at the base. This rare and beautiful species is closely allied to the preceding, but is well distinguished by its straight and nearly simple whorled ramuli. *Fruit* unknown.

3. G. *multifida*, Ag. *Multifid Griffithsia.* Filaments slender, setaceous, distichously branched, whorled with dichotomous, incurved ramuli; whorls distant; articulations of the branches very long. *Harv. in Hook. Br. Fl. v.* ii. *p.* 338.—*Conf. multifida, Huds. E. Bot. t.* 1816.

Rocky shores, not very uncommon. Bantry; *Miss Hutchins.* Kilkee and Miltown Malbay; *W. H. Harvey.* 2—6 inches high, slender. *Capsules* minute, scattered on the whorled ramuli.

4. G. *setacea*, Ag. *Setaceous Griffithsia.* Filaments dichotomous, setaceous, rigid, straight, naked; axils very acute; articulations cylindrical, 5—6 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 338.—*Conf. setacea, Dillw. t.* 82. *E. Bot. t.* 1689.

Sea-shores, not uncommon. 3—8 inches long, forming dense, often inextricable tufts. *Filaments* slender, naked, throwing out occasional creeping fibres. *Involucres* raised on lateral clavate peduncles.

5. G. *corallina*, Ag. *Coral-like Griffithsia.* Filaments thickish, gelatinous, dichotomous; axils patent; articulations swollen upwards, 2—4 times longer than their diameter. *Harv. in Hook. Br. Fl. v.* ii. *p.* 338.—*Conf. corallina. Dillw. t.* 98. *E. Bot. t.* 1815.

Very rare. South Bull; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.*

55. Callithamnion. *Lyngb.* Callithamnion.

Frond filamentous; filaments articulate, mostly pinnate, one-tubed; dissepiments hyaline. *Fructification:* 1. trisporous capsules with hyaline pericarps, scattered on the ultimate ramuli; 2. roundish or lobed gelatinous *receptacles (flavellæ)*,

containing large granules, seated on the main branches.—Name; καλος, *beautiful*, and θαμνος, a *shrub*. A most difficult genus, forming endless species and varieties. In the following descriptions, the term "*plumula*" is applied to a penultinate-branchlet, when pinnate or bipinnate.

A. *Filaments erect, much branched, not rising from creeping fibres.*

a. *Ramuli opposite.*

1. C. *Plumula*, Lyngb. *Pectinated Callithamnion.* Ramuli short, opposite, recurved, pectinated on their inner margins. *Harv. in Hook. Br. Fl. v.* ii. *p.* 339.—*Conf. Plumula, Dillw. t.* 50.—*Conf. Turneri, E. Bot. t.* 1637. (not *t.* 2339.)

Sea-shores, not common. Bantry; *Miss Hutchins.* Killiney; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.* 2—4 inches high, much branched, fine rose-red. This is well marked by its very peculiar and symmetrical ramuli.

2. C. *pumilum*, Harv. *Slender Cruciate Callithamnion.* Filaments sparingly branched; ramuli very short, opposite, pinnated; pinnæ abreviated, very erect; main articulations* 2—3 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 339.

Very rare. Miltown Malbay; *W. H. Harvey.* About an inch high, distantly branched, forming small tufts; each articulation furnished with a pair of very short pinnated ramuli.

b. *Ramuli alternate; pinnate or dichotomous.*

1. *Secondary branches pinnate or plumulate.*

† *Main stems inarticulate.*

3. C. *Arbuscula*, Lyngb. *Shrubby Callithamniom.* Stems naked below, robust, cartilaginous; main branches set with short branchlets, which are again thickly clothed with minute, imbricated, oblong plumules; ultimate pinnules simple or forked, recurved or divaricating, attenuate, acute; capsules very numerous, lining the inner faces of the pinnules. *Harv. in Hook. Br. Fl. v.* ii. *p.* 340.—*Conf. Arbuscula, R. Brown. Dillw. t.* 85. *E. Bot. t.* 1916?—*Dasya Arbuscula and spongiosa, Ag.*

On rocks and shells, on our northern and western shores, very common; but not found, that I am aware, on the east coast. 3—5 inches

* By *main* articulations will be understood, the articulations of the stem or branches, in contra-distinction to those of the ramuli.

high, deep claret colour. *Stems* as thick as a crow quill, simple below, much branched above.

4. C. *lanosum*, Harv. *Woolly Callithamnion.* Stem slender, inarticulate (or very indistinctly jointed), much branched; branches jointed, excessively divided, entangled, flexuose, spreading; plumules crowded, quadrifarious, broadly ovate, obtuse; lower pinnules simple, divaricate; upper spreading and subpinnulate; articulations of the branches 2—3 times longer than broad, of the pinnæ shorter; capsules subsolitary. *Harv. in Hook. Br. Fl. v.* ii. *p.* 341.

At Killiney and Wicklow; *W. H. Harvey.* 1—3 inches high, rose-red, much entangled. In drying it fades to a dull pink, wholly without gloss; and on re-immersion is extremely fragile, and quickly loses colour. Its nearest affinity is with *C. roseum.*

†† *Main stems more or less distinctly articulate.*

* *Plumules lax, ovate, lanceolate or irregular, subsimply pinnate.*

5. C. *roseum*, Ag. *Rosy Callithamnion.* Stems much and loosely branched; secondary branches long, flexuose, subdistichously plumulate; plumules lax, with a roundish outline, crowded toward the tops of the branches; pinnules long, patent, subsimple and flexuose; main articulations 4—5 times, those of the pinnæ 2—3 times, longer than broad; capsules elliptical, scattered, near the base of the pinnæ. *Harv. in Hook. Br. Fl. v.* ii. *p.* 341.—*Conf. rosea, E. Bot. t.* 966. *Dillw. t.* 17. ??—*Cer. roseum, Roth.*

On the larger Algæ. Bantry; *Miss Hutchins.* Arran; *J. T. Mackay.* 2—4 inches high, excessively branched; *branches* long and flexuose, distichous or quadrifarious. *Plumules* fasciculate toward the summit. 4—6 lines long, the lower pinnules simple, the upper sparingly pinnulate about the apices. *Colour* purple-red. *Main articulations* somewhat opaque, filled with jointed veins.

6. C. *polyspermum*, Ag. *Many-fruited Callithamnion.* Filaments slender, delicate, loosely branched, somewhat naked below, distichously plumulate above; plumules linear-oblong (in outline); pinnæ short, simple, patent, acute, spine-like; articulations of the branches 4—5 times, of the ramuli twice as long as broad; capsules lining the inner faces of the pinnæ. *Harv. in Hook. Br. Fl. v.* ii. *p.* 342.

Bantry bay; *Miss Hutchins.* Youghal; *Miss Ball.* Portrush; *Mr. D. Moore.* 1—3 inches high, somewhat naked or with short branches at the base, much and sub-flabellately branched upwards; lower part of the branches set with spine-like ramuli, upper alternately plumulate. *Plumules* simply pinnate, the pinnæ nearly of equal length throughout. *Colour* full dark red. *Main articulations* swollen at the joints, with a very narrow tube.

7. C. *tetricum*, Ag. *Rope-like Callithamnion.* Rigid;

branches densely ramulose, hairy below, plumulate above; plumules crowded, quadrifarious, oval, simply pinnate; pinnæ acute, basally attenuate, erecto-patent; articulations 2—3 times longer than broad; capsules elliptical, minute, on short lateral processes of the pinnulæ. *Harv. in Hook. Br. Fl. v.* ii. *p.* 342. *Conf. tetrica, Dillw. t.* 81. *E. Bot. t.* 1915.

Rocky shores; common on our western and southern coasts. 2—8 inches long, forming dense ropy tufts, of a dull red-brown colour.

8. C. *tetragonum*, Ag. *Square-stalked Callithamnion.* Stem robust, naked below, decomposito-pinnatedly branched; branches patent, set with short, alternate, spreading plumules, which are pinnate below, and fasciculately multifid above; apices obtuse, with a mucro; articulations once and half as long as broad; joints contracted. *Harv. in Hook. Br. Fl. v.* ii. *p.* 343.—*Conf. tetragona, Dillw. t.* 65. *E. Bot. t.* 1690.

On the larger Algæ, not uncommon. 3—8 inches high, dull red, becoming brownish in the herbarium. The robust, cartilaginous, and many times pinnate stems, with the short articulations, and ramuli *contracted* at the apex, (thus suddenly acuminate,) distinguish this species.

9. C. *granulatum*, Ag. (?) *Warted Callithamnion.* Stem robust, naked below, pinnatedly branched; branches erecto-patent, set with short, subquadrifarious, erect plumules, which are pinnate below, and multifid and level-topped above; pinnules subulate, very erect and close pressed; articulations of the ramuli twice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 343. *Ag. Sp. Alg. v.* ii. *p.* 177.?

At Kilkee, County of Clare, on *Codium tomentosum.* 2—4 inches high. *Stems* mostly simple, set with alternate branches; each *frond* with a lanceolate outline. *Colour* brownish-red.—It must be confessed that this borders very closely, indeed, on the preceding, from which it is best distinguished by its more erect and level-topped plumules, subulate pinnules, and rather longer joints. But, after all, perhaps, it is not sufficiently entitled to specific rank. Having seen no authentic specimens of Agardh's plant, I am unable, with certainty, to quote his work, but his description agrees pretty fully with our Irish specimens.

10. C. *Grevillii*, Harv. *Greville's Callithamnion.* Slender, sparingly and distichously branched; plumules linear-obovate, round-topped; pinnæ erect; the lower ones short and spine-like the upper long, branched at top; articulations of branches 2—3 times, of pinnules once and half as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 345.—*C. roseum, Grev., Fl. Edin. p.* 311. *(not of Roth.)*

On rocks and Algæ in the sea. Bantry bay; *Miss Hutchins.* 1—2 inches high, forming small tufts. *Branches* long, their lower part furnished with short irregular ramuli, their upper half distichously plumulate. *Plumules* long, narrow-obovate; upper pinnæ alternately branched at top. *Colour* purplish-red.

* * *Plumules dense, lanceolate or narrow-oblong, bipinnate.*

11. C. *gracillimum*, Ag. *Graceful Callithamnion.* Filaments capillary, decomposito-pinnate, distichous; upper plumules long, narrow-ovate or sublanceolate, patent, bi-tripinnate; main articulations cylindrical, 3—4 times, those of the pinnæ 2—3 times longer than broad; capsules terminal on the pinnules. *Harv. in Hook. Br. Fl. v.* ii. *p.* 345.

Very rare. Black Castle, Wicklow; *W. H. Harvey. Filaments* 1—4 inches high, distichously branched, many times pinnate; the outline of the principal branches broadly ovate, and resembling most delicate *ferns* in miniature. *Colour* rose-red.

2. *Secondary or smaller branches alternately dichotomous. Capsules elliptical, solitary, mostly axillary; favellæ binate.*

12. C. *corymbosum*, Ag. *Corymbose Callithamnion.* Capillary, flaccid, gelatinous, entangled; secondary branches alternate, excessively dichotomous, subflabellate, level-topped; ultimate dichotomies acute, appressed; articulations of branches 8—10, of the ramuli 5—6 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 346.—*Conf. corymbosa, E. Bot. t.* 2352. *(joints too short.) Cal. byssoideum, Am. MS. Harv. l. c. p.* 342.

Rare. Bantry bay; *Miss Hutchins.* South Bull, Dublin; *W. H. Harvey.* 1—3 inches high, excessively delicate and tender, much branched, secondary branches byssoid, rose-red. I have been favoured with an extensive series of this variable plant by my kind friends, Mrs. Griffiths and Miss Cutler; and now fully agree with these acute botanists in considering the *C. byssoideum* of the *Br. Fl.* only as a variety, whose peculiar characters probably depend on age. The position of the capsules, which I had hoped constant, is very variable; and they are often lateral and axillary in the same individual.

13. C. *versicolor*, Ag. *Changeable Callithamnion.* Filaments setaceous at base, capillary above, distichously branched in a pinnate manner; penultinate branches naked below, dichotomous above, level-topped; ultimate dichotomies spreading; main articulations 4—6, those of the ramuli 2—3 times longer than broad; capsules solitary, axillary. *Harv. in Hook. Br. Fl. v.* ii. *p.* 346.—*β. seirospermum;* ultimate ramuli moniliform; joints globular, inclosing a dark red mass. *Wyatt. Alg. Danm. No.* 91.

Very rare. South Bull, Dublin, (a single specimen); *W. H. Harvey.* 3—4 inches high, as thick as hog's bristle at base, distichously branched, of a fine rose-red colour. A larger and coarser plant than *C. corymbosum*, the branches pinnate and naked at base.—β. is a very remarkable variety discovered at Torquay by Mrs. Griffiths, in which the ultimate ramuli seem resolved into chain-like strings of capsules; each joint having the appearance and structure of a capsule. This variety

of fructification I have never seen produced in any other species of the genus.

14. C. *spongiosum*, Harv. *Spongy Callithamnion.* Stems robust, cartilaginous, branched in every direction; branches thickly set with dense, quadrifarious, repeatedly dichotomous, round-topped branchlets; axils patent; apices short, bifid; articulations of the branches swollen at the joints, thrice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 346. *Wyatt. Alg. Danm. No.* 93.

On perpendicular rocks on our eastern shores; as at Kingstown, Killiney, Wicklow, &c. where it occupies the place that *C. Arbuscula* and *tetricum* hold on the western; *W. H. Harvey.* 2—4 inches high, flaccid. *Stems* shrubby. *Branches* spreading in every direction, and densely clothed with short secondary branches. *Colour* a red-brown.

15. C. *pedicellatum*, Ag. *Stalk-fruited Callithamnion.* Stems setaceous, loosely and irregularly branched; branches naked or set with short, alternate, subfasciculate, sparingly dichotomous branchlets; apices obtuse; articulations variable, mostly very long; capsules solitary, elliptical, or pyriform, axillary, pedicellate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 347.—*Conf. pedicell. Dillw. t.* 108. *E. Bot. t.* 1817.

Rare. Bantry; *Miss Hutchins.* Miltown Malbay; *W. H. Harvey. Stems* 2—6 inches high, as thick as horse hair. *Branches* sparingly divided, springing near the base, irregularly set with short ramuli, which are crowded round the apices in a penicellate manner; *apices* always very blunt. *Capsules* dark pyriform, seated on hyaline pedicels. *Colour* full pink, which is almost instantly discharged in fresh water, when the plant assumes a dull brown hue and rapidly decomposes.

B. *Small parasitical species, rising from creeping filaments; branches erect. Receptacles pedicellate, involucrate.*

16. C. *Turneri*, Ag. *Turner's Callithamnion.* Stems rising from creeping filaments, erect, simple, or slightly branched, oppositely pinnated; articulations of the stem 5—10 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 339.—*Conf. Turneri, Dillw. t.* 100. *E. Bot. t.* 2339. *(not t.* 1637.*) Cer. Turneri, Grev. Crypt. t.* 355.

On the larger Algæ, not uncommon. *Tufts* 1—2 inches high.

17. C. *Pluma*, Ag. *Feathery Callithamnion.* Stems rising from creeping filaments, erect, subsimple, naked below, the upper half oppositely pinnate; pinnæ erect, appressed; articulations of the stem 2—4 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 340.—*Conf. Pluma, Dillw. Supp. t. F*

On the stems of *Laminaria digitata.* Bantry; *Miss Hutchins.* Malbay; *W. H. Harvey. Stems* half an inch high, resembling beautiful minute feathers.

18. C. *repens*, Lyngb. *Creeping Callithamnion.* Stems rising from creeping filaments, erect, sparingly branched; branches alternate, patent, with a few short ramuli; articulations of the stem 3—6 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 348.—*Conf. repens, Dillw. t.* 18. *E. Bot. t.* 1608. *(the young plant.)*

On the larger Algæ. I fear this is not sufficiently distinct from some states of *C. Turneri.*

56. TRENTEPOHLIA. *Ag.* Trentepohlia.

Frond filamentous; filaments (minute, mostly parasitical,) erect, coloured, articulated; dissepiments hyaline. *Fructification* tufted, mostly terminal capsules.—Named in honour of a German Botanist.—This appears to me a very natural little group, though in essential character scarcely differing from *Callithamnion.* The species are mostly minute parasites.

* *Growing in the sea, or on maritime rocks.*

1. T. *Rothii*, Harv. *Roth's Trentepohlia.* Widely spreading, densely cæspitose; filaments slender, short, erect, dichotomous; branches elongate, straight, appressed; articulations twice as long as broad. *Callithamnion Rothii, Lyngb. Harv. in Hook. Br. Fl. v.* ii. *p.* 347.—*Conf. Rothii, Dillw. t.* 73. *E. Bot. t.* 1702.

Marine rocks, near high-water mark. *Tufts* ½—1 inch high, dense, deep red or purple. *Capsules* clustered, borne on short terminal subcorymbose ramuli.

2. T. *floridulum*, Harv. *Pale-red Trentepohlia.* Filaments short, densely entangled, sparingly branched; branches alternate or subdichotomous, nearly simple, appressed; articulations thrice as long as broad. *Callithamnion florid. Ag.—Harv. in Hook. Br. Fl. v.* ii. *p.* 348. *Conf. florid. Dillw. Sup. t. F.*

Rocks near low-water mark, Galway Coast; *J. T. Mackay.* Antrim; *Dr. Scott.* This, I imagine, is only *C. Rothii*, altered by growing in deeper water.

3. T. *purpurea*, Ag. *Purple Trentepohlia.* Filaments erect, very minute, forming continuous, velvety patches, slightly branched; branches dichotomous; articulations twice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 382.—*Conf. purpurea, Dillw. t.* 43. *Byssus purpurea, E. Bot. t.* 192.

On rocks by the sea-coast, beyond high-water mark. Perhaps I am incorrect in introducing this species, (a native of the West of Scotland and England,) to the Irish Flora, without having a certain knowledge of its existence on our shores, though it is more than probable that it abounds on the trap rocks of our northern and western coasts. My apology for so doing is a desire to contrast it with *T. Rothii* and

floridulum, in order to show how very slight are its distinguishing characters.

4. T. *sparsa*, Harv. *Scattered Trentepohlia.* Filaments minutely tufted, scattered, sparingly branched; branches spreading, unequal; articulations twice or thrice as long as broad; "capsules obovate, sessile, mostly axillary." *(Carm.) Callith. sparsum, Harv. in Hook. Br. Fl. v.* ii. *p.* 348.—*C. floridulum, Lyngb.?*

On various marine Algæ. On *Conf. rupestris*, at Miltown Malbay; *W. H. Harvey.* Scarcely a line high. Distinguished from *T. purpurea* by its scattered habit and different habitat.

5. T. *Daviesii*, Harv. *Davies' Trentepohlia.* Rose-red, minutely tufted, much branched; branches flexuose, scattered, distant, erecto-patent, with a few erect ramuli; apices acuminate; articulations 3—5 times longer than broad. *Callith. Daviesii, Ag.—Harv. in Hook. Br. Fl. v.* ii. *p.* 348. *Conf. Daviesii, E. Bot. t.* 2329.

On *Ceramium rubrum*, at Bantry; *Miss Hutchins* and *Mr. R. Ball.* 2—4 lines high, elegantly tufted.

6. T. *secundata*, Harv. *Secund Trentepohlia.* Rose-red, very minute, tufted, flexuose, sparingly branched; branches set with short, secund, close-spreading, obtuse ramuli; articulations four times longer than broad. *Callith. secundatum, Ag.—Harv. in Hook. Br. Fl. v.* ii. *p.* 349. *C. Daviesii, β. secundata. Lyngb. Hydroph. Dan. t.* 41.

On *Porphyra laciniata, Alaria esculenta*, &c. A line or less in height, forming minute tufts or spreading in continuous velvety patches. *Capsules* tufted, terminal, on abbreviated ramuli.

7. T. *lanuginosa*, Harv. *Down-like Trentepohlia.* Nearly simple, exceedingly minute, brownish; ramuli short, obtuse, secund; articulations thrice as long as broad, pellucid in the centre. *Callith. lanuginosum, Lyngb.—Harv. in Hook. Br. Fl. v.* ii. *p.* 349. *Conf. lanug. Dillw. t.* 45.

On decaying filamentous Algæ, especially *Cer. rubrum*, very common. The most minute of the genus.

* * *Growing in fresh water.*

8. T. *pulchella*, Ag. *Beautiful Trentepohlia.* Filaments minute, virgate, tufted, much branched; branches erect, alternate, beset with short, opposite or secund ramuli; articulations four times as long as broad; capsules racemose. *Harv. in Hook. Br. Fl. v.* ii. *p.* 382.—*Conf. nana, Dillw. t.* 30. *(not characteristic.) E. Bot. t.* 2585.—*β. chalybea, Ag.—Conf. chalybea, Dillw. t.* 91. *E. Bot. t.* 1666. *f.* 1.

In mountain streams; growing on the naked rock, or on aquatic mosses. About Killarney, Glengariff, &c. $\frac{1}{8}$—$\frac{1}{2}$ inch long, much

branched. In α. rose-red, in β. dull bluish-grey. This closely resembles the marine *T. virgatula*.

Div. III. CHLOROSPERMEÆ.

Plants growing either in the sea, in fresh water, on damp ground, or in anomalous situations; filamentous, membranaceous, or amorphous; either hyaline or (owing to the presence of an internal granular mass), of a grass green, very rarely purple colour. Fructification: green or purple *sporules*, either filling the frond or collected into *sporidia*, rarely forming external *capsules*.

Tribe XIV. LEMANIEÆ.

Plants growing in fresh water, filamentous, inarticulate, of a cartilagineo-coriaceous substance and cellular structure. Fronds hollow, furnished at irregular distances with whorls of papillæ, or moniliform. Fructification: fasciculate, simple or dichotomous, moniliform filaments, attached to the inner surface of the tubular frond, and finally dissolved into elliptic sporules.

57. Lemania. *Bory.* Lemania.

Frond filiform, tubular, coriaceous, cellular, torulose. *Fructification:* hyaline sporules, aggregated into moniliform, simple or branched penicellate filaments, attached to the inner face of the tubular frond.—Name in honour of a French Alogologist, *M. Leman.*

1. L. *fluviatilis*, Ag. *River Lemania.* Filaments branched, olive-green, torulose, attenuated; intervals between the swellings cylindrical, much longer than they are broad. *Hook.—Hook. Br. Fl. v.* ii. *p.* 322.—*Conf. fluv. Dillw. t.* 29. *E. Bot. t.* 1763.

Rocky beds of rivers, in subalpine districts. Common in the rivulets about Killarney, &c.

Tribe XV. BATRACHOSPERMEÆ.

Plants growing in fresh water, filamentous, articulate, invested with gelatine. Fronds composed of aggregated, articulate, longitudinal fibres, whorled at uncertain intervals with short, horizontal, moniliform ramuli. Fructification: dense globular

masses attached to the verticillate ramuli, and consisting of minute, radiating, dichotomous, moniliform filaments.

58. BATRACHOSPERMUM. *Roth.* Batrachospermum.

Main filaments invested with gelatine, hyaline, tubular, longitudinally striated, composed of colourless jointed fibres, agglutinated together, beset with distant whorls of moniliform ramuli. *Fructification:* globules of dense filaments attached to the ramuli.—Name; βατραχος, a *frog*, and σπερμα, *frog-spawn*; which the species, when removed from the water, resemble. This genus is in structure allied to *Trichocladia* and *Mesogloia*, but essentially differs in the structure of its fructification. Indeed the *Batrachospermeæ* are much in the same way related to the *Gloiocladeæ*, as the *Alismaceæ* are to *Ranunculaceæ*.

1. B. *vagum*, Ag. *Cylindrical Batrachospermum.* Frond subdichotomous, cylindrical, equal; apices of the branches incrassated. *Harv. in Hook. Br. Fl. v.* ii. *p.* 388.

In alpine bogs and lakes. This beautiful species varies in colour, from dull to bright and even æruginose green; under the microscope it is hyaline.

2. B. *moniliforme*, Ag. *Moniliform Batrachospermum.* Irregularly branched; branches moniliform; apices attenuated. *Harv. in Hook. Br. Fl. v.* ii. *p.* 388.—*Conf. gelatinosa, Dillw. t.* 32. *E. Bot. t.* 689.—*β. detersum, Ag.;* verticillate ramuli subobliterated. *Conf. atra, Dillw. t.* 11. *E. Bot. t.* 690.

In sub-alpine rivulets. Scarcely differs from the former, but by its rather more distant whorls.

TRIBE XVI. CHÆTOPHOROIDEÆ.

Plants growing in the sea or in fresh water, invested with gelatine, either filiform, or (a number of filaments being collected together) formed into gelatinous amorphous fronds. Filaments articulate; articulations hyaline in the middle, coloured at the dissepiments. Fructification: so far as known, minute capsules attached to the ramuli.

59. BULBOCHÆTE. *Ag.* Bulbochæte.

Filaments free, articulated, branched; each articulation bearing at its truncate apex either an elongated, inarticulate, deciduous seta, or a sessile, sphærical capsule; base of the seta scutate, amplexicaul.—Name; βολβος, a *bulb*, and χαιτη, a

bristle; in allusion to the setaceous ramuli with swollen bases.

1. B. *setigera*, Ag. *Setigerous Bulbochæte. Ag. Syst. p.* 123. *Harv. in Hook. Br. Fl. v.* ii. *p.* 350.—*Conf. vivipara, Dillw. t.* 59.

On fresh water plants, in lakes, &c. About half an inch long, densely tufted, dull greenish-brown.

60. Draparnaldia. *Bory.* Draparnaldia.

Filaments free, gelatinous; stems subhyaline, emitting, at the joints, pencils of coloured ramuli. *Fructification* not certainly known.—Named in honour of *J. P. R. Draparnaud*, a French Naturalist.

1. D. *plumosa*, Ag. *Feathery Draparnaldia.* Pencils of ramuli linear-lanceolate, acute. *Harv. in Hook. Br. Fl. v.* ii. *p.* 388.—*Conf. lubrica, E. Bot. t.* 2087.

In streams and wells.

2. D. *glomerata*, Ag. *Clustered Draparnaldia.* Pencils of ramuli ovate, obtuse, patent. *Harv. in Hook. Br. Fl. v.* ii. *p.* 388.—*Conf. mutabilis, Dillw. t.* 12. *E. Bot. t.* 1746.

In streams and wells. This scarcely differs from the preceding.

3. D. *tenuis*, Ag. *Slender Draparnaldia.* Ramuli simple, subfasciculate; primary filaments partially coloured. *Harv. in Hook. Br. Fl. v.* ii. *p.* 388.—*Conf. lubrica, Dillw. t.* 57.—*C. protensa, Dillw. t.* 67.

In rivulets. This has quite the habit of *Conferva*, and very different, indeed, from that of the two former species.

61. Chætophora. *Ag.* Chætophora.

Frond gelatinous, globose or lobed, rarely plane and crustaceous, composed of numerous filaments aggregated together, and issuing from a common base. *Filaments* articulated, branched; articulations of the branches subhyaline, those of the ramuli coloured. *Fructification:* capsules attached to the ramuli.—Name; χαιτη, a *bristle*, and φορεω, *to bear;* the ramuli are, in some stage of growth, tipped with long setaceous points or bristles. Fructification has only been discovered on *C. pisiformis* and *C. pellita.*

1. *Grow in fresh water.*

1. C. *endiviæfolia*, Ag. *Stag's-horn Chætophora.* Frond elongated, filiform, somewhat compressed, subdichotomously

branched. *Harv. in Hook. Br. Fl. v.* ii. *p.* 389.—*Ulva incrassata, E. Bot. t.* 967.

In lakes and streams, attached to stones.

2. C. *tuberculosa,* Hook. *Tubercular Chætophora.* Frond at first globose and firm, afterwards much lobed, fragile and hollow; filaments very slender, flexuose, hyaline; ramuli coloured, palmato-fasciculate. *Harv. in. Hook. Br. Fl. v.* ii. *p.* 389. —*Rivularia tuberculosa, E. Bot. t.* 2366.

In boggy pools.

3. C. *elegans,* Ag. *Elegant Chætophora.* Frond subglobose, gelatinous, solid, green; filaments subdichotomous; ramuli fastigiate, attenuate; the apices produced beyond the gelatine. *Carm.—Harv. in Hook. Br. Fl. v.* ii. *p.* 389.

In stagnant pools.

2. *Marine, crustaceous.*

4. C. *pellita,* Lyngb. *Purple Crustaceous Chætophora.* Frond purple-brown, crustaceous, gelatinoso-coriaceous, indefinitely spreading. *Harv. in Hook. Br. Fl. v.* ii. *p.* 390. *Berk. Alg. t.* 1. *f.* 3.

Rocks and stones in the sea. Miltown Malbay; *W. H. Harvey.*

62. Myrionema. *Grev.* Myrionema.

Mass gelatinous (exceedingly minute), effused, composed of very short, clavate, erect, mostly simple filaments, "fixed at their base to a thin expansion." *(Grev.) Fruit: capsules* at the base among the filaments.—Name; μυριος, a *thousand,* and νημα, a *filament.*

1. M. *strangulans,* Grev. *Convex Myrionema.* "Subconvex, confluent; filaments subcylindrical; capsules shortly pedicellated, "affixed to the basal lamina." *Grev. Crypt. t.* 300. *Harv. in Hook. Br. Fl. v.* ii. *p.* 391.

On various Algæ, parasitical. 1—2 lines in diameter, brown.

Tribe XVII. CONFERVEÆ.

Plants growing in the sea or in fresh water, filamentous, articulate, without definite gelatine. Fronds very variable in appearance, simple or branched; articulations more or less filled with a green, very rarely brown or purple, granular mass, which affects various forms, and is supposed to be of a sporaceous nature.

63. Conferva. *Ag.* Conferva.

Filaments articulated, free, distinct, uniform, simple or branched. *Fruit* (?) an internal, coloured, granular *mass (endochrome)*. *Colour* green, rarely purple or orange.—Name, from *confer-ruminare*, to *consolidate*.

A. *Filaments simple.*

a. *Filaments decumbent, arachnoid, forming strata of a purple colour. Inhabit alpine bogs.*

1. C. *ericetorum*, Roth. *Moor Conferva.* Filaments very slender, simple, forming a thin, dull, purple stratum; articulations a little longer than broad; endochrome dark-coloured, filling the tube finally, bipartite, unaltered in drying. *Dillw. Conf. t.* 1. *E. Bot. t.* 1553. *Harv. in Hook. Br. Fl. v.* ii. *p.* 350.

On dry heaths, frequent: occasionally in wet spots.

2. C. *purpurascens*, Carm. *Purple Conferva.* Filaments very slender, simple, forming a cloudy, floating, purple stratum; articulations once or twice as long as broad; endochrome collapsed, pale, rarely filling the tube. *Harv. in Hook. Br. Fl. v.* ii. *p.* 350.

In old turf pits, bogs, &c.

b. *Filaments elongated, floating, rarely attached, flaccid, forming green strata. Inhabit fresh water.*

3. C. *bombycina*, Ag. *Silky Conferva.* Filaments excessively fine, forming a cloudy, floating, yellow-green stratum; articulations 3—5 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 350.—*Conf. sordida, Dillw. t.* 60.

In stagnant waters, infesting aquatic plants.

4. C. *floccosa*, Ag. *Floccose Conferva.* Filaments very fine, forming pale-green floating strata; articulations once or twice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 351.—*C. fugacissima, Dillw. Suppl. t. B.*

In ditches and pools, with the preceding.

5. C. *zonata*, Webr. et Mohr. *Banded Conferva.* Filaments unequal, forming bright-green lubricous masses; articulations rather longer than broad, marked in the centre with a full-green band. *Ag. Syst. p.* 90. *Dillw. p.* 41. *t.* 47. *(C. lubrica.) Harv. in Hook. Br. Fl. v.* ii. *p.* 351.

On stones in rivulets.

6. C. *vesicata*, Ag. *Inflated Conferva.* Filaments very

slender, forming dull-green strata; articulations variable in length, 2—5 times longer than broad, here and there inflated. *Harv. in Hook. Br. Fl. v.* ii. *p.* 351.—*C. alternata, Dillw. Sup. t. B. C. tumidula, E. Bot. t.* 1670.

In stagnant water.

7. C. *rivularis*, Linn. *River Conferva.* Filaments slender, very long, straight, bright-green, silky, forming tufted bundles; articulations 2—4 times longer than broad. *E. Bot. t.* 1654. *Dillw. t.* 39. *Harv. in Hook. Br. Fl. v.* ii. *p.* 351.

In streams and rivers, common.

8. C. *mucosa*, Mert. *Mucous Conferva.* Filaments forming a floating bright-green stratum, extremely gelatinous, invested with definite mucus; articulations about as long as broad. *Dillw. Conf. Suppl. t. B. Harv. in Hook. Br. Fl. v.* ii. *p.* 351.

In stagnant water, rare. Bantry; *Miss Hutchins.*

9. C. *dissiliens*, Dillw. *Fragile Conferva.* Filaments elongated, straight, very fragile, slimy and gelatinous, forming bright green floating masses; articulations half as long as broad. *Dillw. Conf. t.* 63. *Harv. in Hook. Br. Fl. v.* ii. *p.* 352.

In streams and ditches. Glendine-wood; *Miss Ball.* I am not well acquainted with this plant; may it not prove a true *Desmidium?*

10. C. *capillaris*, Linn. *Capillary Conferva.* Filaments pale-green, void of lubricity, much curled and interwoven into subrigid, extensive strata; articulations 3—4 times longer than broad. *E. Bot. t.* 2364. *Harv. in Hook. Br. Fl. v.* ii. *p.* 352. —*C. crispa, Dillw. Suppl. t. B.*

In streams and rivulets, not rare.

c. *Filaments forming crisped, entangled strata, green. Inhabit the sea or salt water ditches.*

11. C. *Linum*, Roth. *Flax-like Conferva.* Filaments thick, rigid, crisped, forming loose extensive bundles of a dull green colour; articulations once and half as long as broad. *Ag. Syst. p.* 97. *Harv. in Hook. Br. Fl. v.* ii. *p.* 352.

In salt water ditches, along the muddy sea-shore, or in the sea. At Wicklow; *W. H. Harvey.* Portstewart; *Mr. D. Moore.*

12. C. *crassa*, Ag. *Thick Conferva.* Filaments very thick, of great length, deep glossy-green, much crisped, rigid, forming loosely entangled harsh masses; articulations as long as broad. *Conf. capillaris, Dillw. t.* 9.—*C. crassa, Ag. Harv. in Hook. Br. Fl. v.* ii. *p.* 352.

In salt water ditches. Abundant in ditches by the North Wall, Dublin.

13. C. *tortuosa*, Dillw. *Twisted Conferva.* Filaments rigid,

slender, much curled and twisted, forming broad, closely entangled strata; articulations 2—3 times longer than broad. *Dillw. t.* 46. *Harv. in Hook. Br. Fl. v.* ii. *p.* 352.

On marine rocks, abundant.

14. C. *implexa*, Dillw. *Interwoven Conferva.* Filaments very slender, capillary, rather flaccid, forming extensive, much entangled, bright-green strata; articulations rather longer than broad. *Dillw. Sup. t. B. Harv. in Hook. Br. Fl. v.* ii. *p.* 352. *Bangia Johnstoni, Grev. in Johnst. Berw. Fl. v.* ii. *p.* 260.

On marine rocks. Bantry; *Miss Hutchins. Filaments* half the diameter of *C. tortuosa*, with shorter joints.

15. C. *ulothrix*, Lyngb. *Short-jointed curled Conferva.* Filaments slender, flexuose, entangled, somewhat rigid; articulations rather shorter than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 353.

In rocky pools, attached to small Algæ. Bantry; *Miss Hutchins*, whose specimen is mixed with *C. implexa*, from which this species is solely distinguished by its shorter joints.

16. C. *perreptans*, Carm. *Creeping Conferva.* Filaments slender, crisped, entangled into dull-green strata, bent at acute angles, and at the genuflexion sending out attenuated creeping radicles; articulations about twice as long as broad. *Zygnema littoreum, Lyngb. Hydr. Dan. t.* 59.—*C. perreptans, Harv. in Hook. Br. Fl. v.* ii. *p.* 353.

On rocks, near the verge of high-water mark. Miltown Malbay. This may, perhaps, be only a variety of *C. tortuosa.* It has lately been discovered on the Coast of Devonshire by *Mrs. Griffiths.*

17. C. *arenosa*, Carm. *Strand Conferva.* Filaments slender, rigid, interwoven into broad strata; articulations 3—5 times longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 353.

On the flat shore, about half-tide level. Bantry bay; *Mr. R. Ball. Filaments* very long and slender, forming wide strata.

d. *Filaments tufted, with a scutate root, straight, green. Inhabit the sea.*

18. C. *Melagonium*, Web. et Mohr., Ag. *Wiry Conferva.* Filaments elongate, scattered, straight, thick, erect, stiff and wiry, dark-green; articulations twice as long as broad. *Dillw. Suppl. t. B. Harv. in Hook. Br. Fl. v.* ii. *p.* 353.

On rocky shores, rare. Miltown Malbay, &c. Portrush; *Mr. D. Moore.*

19. C. *ærea*, Dillw. *Harsh verdigris Conferva.* Filaments elongated, tufted, straight, harsh, brittle, yellow-green; articulations as long as broad. *Dillw. t.* 80. *E. Bot. t.* 1929. *Harv. in Hook. Br. Fl. v.* ii. *p.* 354.

Sand-covered rocks in the sea. 3—12 inches long, as thick as hog's bristle, yellow-green, harsh.

e. *Filaments rising from disciform tubercles, and forming penicillate tufts, olivaceous, parasitical. Inhabit the sea.*

20. C. *fucicola*, Velley. *Large parasitic Conferva.* Filaments rising from a minute tubercle, penicillate, flaccid, membranaceous; articulations about twice as long as broad. *Dillw. t.* 66. *Harv. in Hook. Br. Fl. v.* ii. *p.* 345.

On Fuci, especially *F. nodosus* and *vesiculosus*, common.

21. C. *flaccida*, Dillw. *Flaccid rusty Conferva.* Tubercles small; filaments penicillate, flaccid and tender; lower articulations half as long as broad, upper of equal length and breadth. *Dillw. Conf. Sup. t. G. Harv. in Hook. Br. Fl. v.* ii. *p.* 355.

Parasitical on *Cystoseira fibrosa.*

22. C. *curta*, Dillw. *Small Parasitic Conferva.* Filaments minute, rising from a tubercle, rather rigid, subpenicillate; articulations about as long as broad. *Dillw. t.* 76. *Harv. in Hook. Br. Fl. v.* ii. *p.* 355.

On sundry Fuci.

23. C. *scutulata*, Sm. *Target Conferva.* Olive-brown; filaments branched at the base, densely combined into a depressed peltate mass, rooted in the centre; joints as long as broad. *Sm. —Dillw. t.* 76. *Harv. in Hook. Br. Fl. v.* ii. *p.* 355.

On *Himanthalia lorea*; on which it forms broad wart-like tubercles.

B. *Filaments branched.*

a. *Inhabit fresh water.* (C. glomerata *often grows in the sea.*)

24 C. *flavescens*, Roth. *Yellowish branched Conferva.* Forming pale yellowish strata; filaments slender, sparingly branched; branches alternate or subdichotomous, erecto-patent, with scattered, elongated, alternate or secund ramuli; articulations 8—9 times longer than broad. *Dillw. Conf. Suppl. t. E. —E. Bot. t.* 2088. *Harv. in Hook. Br. Fl. v.* ii. *p.* 356.

In ditches of salt or fresh water.

25. C. *fracta*, Fl. Dan. *Broken divaricated Conferva.* Forming entangled dull-green strata; filaments somewhat rigid, much branched; branches divaricating; ramuli scattered and very patent: articulations 4—6 times longer than broad. *Dillw. t.* 14. *E. Bot. t.* 2338. *Harv. in Hook. Br. Fl. v.* ii. *p.* 356.

In ditches and lakes, common. This floats on the surface, in vast matted, dull green strata.

26. C. *glomerata*, Linn. *Green clustered Conferva.* Root scutate; filaments tufted, bushy, subrigid, bright green; branches crowded, irregular, erect; ultimate ramuli secund, subfasciculate; articulations 4—8 times longer than broad. *Dillw. t.* 13.—*E. Bot. t.* 2192. *Harv. l. c. p.* 356.—C. *lætevirens*, *Dillw. t.* 48. *E. Bot. t.* 1854.

In streams and rivulets and in the sea, common. If all the *supposed* marine varieties of this species really appertain to it, none can be more polymorphous. But I incline to think that more than one species is confounded under this name. The branched marine *Confervæ*, indeed, require great revision, and I earnestly recommend them to the attention of those whose residence gives them an opportunity of watching these plants in their places of growth.

27. C. *ægagropila*, Linn. *Globe Conferva or Moor Balls.* Filaments issuing from a central point, forming dense roundish balls; branches erect, subsecund, straight; articulations 3—4 times longer than broad; the uppermost cylindrical, the lower swollen upwards. *E. Bot. t.* 1377. *Dillw. t.* 17. *Harv. in Hook. Br. Fl. v.* ii. *p.* 357.

In lakes, very rare. Cunnamara; *J. T. Mackay.* This curious plant forms a compact ball, varying in diameter from half an inch to 3—4 inches. It is said to be used as a pen-wiper.

b. *Inhabits maritime rocks, wet with fresh water, and only occasionally exposed to the tide.*

28. C. *Brownii*, Dillw. *Dr. Brown's Conferva.* Filaments densely cæspitose, erect, rigid, flexuose, elastic, slightly branched; branches few, long, subsimple, secund; axils acute; articulations 4—5 times longer than broad, the lower ones thickened upwards, the upper cylindrical. *Dillw. Suppl. t. D. Harv. in Hook. Br. Fl. v.* ii. *p.* 356.

On wet rocks at a cave near Dunrea, Ireland; *R. Brown, Esq.* On shady rocks at the entrance of a small cave beyond Black Castle, Wicklow, where it is exposed to the dripping of fresh water, and the occasional overflow of the tide. *Tufts* spreading, ½—1 inch high, dark glossy green. *Filaments* densely matted together, appearing to originate in a mass of creeping roots. This has a good deal the appearance of a *Vaucheria*, but the structure and substance is totally different. It is not allied to any species I know of, except, perhaps, *C. ægagropila.*

c. *Marine.*

29. C. *pellucida*, Huds. *Pellucid three-branched Conferva.* Filaments cartilaginous, rigid, erect, bright-green; trichotomous; axils very acute, branches erect; articulations many times longer than broad. *Dillw. Conf. t.* 90. *E. Bot. t.* 1716. *(excellent.) Harv. in Hook. v.* ii. *p.* 357.

Rocks near low-water mark, not uncommon. Miltown Malbay and Wicklow. *Stems* subsolitary, simple below, above repeatedly trichotomous, thick, rigid, full-green. The *filaments* are rarely articulated, *except* in the axils.

30. C. *Hutchinsiæ*, Dillw. *Miss Hutchins' Conferva.* Filaments cartilaginous, rigid, glaucous-green, flexuose, tufted, bristly; ramuli curved, simple or furnished on the interior face with processes of one articulation; articulations twice as long as broad. *Dillw. t.* 109. *Harv. in Hook. Br. Fl. v.* ii. *p.* 357.

Rare. Bantry bay; *Miss Hutchins. Filaments* thicker than horse hair, flexuose, 5—8 inches long, much branched.

31. C. *rupestris*, Linn. *Green Rock Conferva.* Filaments slender, rigid, dark-green, straight, tufted, bushy; branches erect, crowded; ramuli fascicled, appressed; articulations 3—4 times longer than broad. *Dillw. t.* 23. *E. Bot. t.* 1699. *Harv. in Hook. Br. Fl. v.* ii. *p.* 357.

Rocks in the sea, very common.

32. C. *nuda*, Harv. MSS. *Brownish bare-branched Conferva.* Filaments subrigid, slender, very straight, dull-green or olivaceous (when dry), sparingly dichotomous; ramuli few and scattered, appressed, the uppermost often opposite; articulations many times longer than broad.

On basalt rocks, Portstewart; *Mr. D. Moore. Filaments* loosely tufted, 2—3 inches high, sparingly branched, very straight, set with a few, scattered, very erect and appressed ramuli, the uppermost ones often opposite, which makes the apices of the branches appear three-forked. *Articulations* very long. This differs from any species with which I am acquainted, but may, perhaps, be the *C. aspera* of Agardh, which, in the *British Flora*, I have doubtfully referred to *C. nigricans*. To avoid confusion I think it better to give a new name to our present plant. In the straight filaments and appressed ramuli it resembles *C. rupestris*, but differs in colour and in the great length of the joints.

33. C. *diffusa*, Roth. *Diffuse green Conferva.* Filaments slender, rigid, dark-green, flexuose, subdichotomous; branches distant, elongated, furnished towards the top with a few short patent, secund ramuli; articulations 3—4 times longer than broad. *Dillw. t.* 21. *E. Bot. t.* 2289. *Harv. in Hook. Br. Fl. v.* ii. *p.* 358.

Marine rocks, rare. Bantry; *Miss Hutchins.* Miltown Malbay; *W. H. Harvey.* Black rocks, Portrush; *Mr. D. Moore.* This resembles *C. rupestris* in microscopic structure, but has a very different habit, being loosely tufted, bristly, with distant and almost naked branches.

34. C. *albida*, Huds. *Whitish cottony Conferva.* Filaments very slender, capillary, flaccid, pale yellow-green, forming dense silky tufts; branches crowded, irregular, the uppermost patent and mostly opposite; ramuli opposite or secund; articu-

lations 4—5 times longer than broad. *Dillw. Suppl. t. E.—E. Bot. t.* 2327. *Harv. in Hook. Br. Fl. v.* ii. *p* 358.

On the larger Algæ. Bantry ; *Miss Hutchins. Filaments* exceedingly slender, pale green, which soon fades to a dirty white.

35. C. *lanosa*, Roth. *Woolly cottony Conferva.* Filaments slender, short, yellow-green, forming dense tufts; branches virgate, erect, subdistant, straight, alternate or opposite, with a few alternate or secund ramuli, axils very acute; lower articulations twice, upper six times as long as broad. *Dillw. Suppl. t. E.—E. Bot. t.* 2099. *Harv. in Hook. Br. Fl. v.* ii. *p.* 358.

On rocks and the larger Algæ. *Tufts* an inch long, pale yellow-green.

36. C. *arcta*, Dillw. *Close green Conferva.* Filaments elongated, forming silky tufts of a full æruginose-green colour, much branched ; branches erecto-patent, crowded ; ramuli erect, appressed, opposite or alternate; lower articulations as long as, upper much longer than broad. *Dillw. Suppl. t. E. E. Bot. t.* 2098. *Harv. in Hook. Br. Fl. v.* ii. *p.* 359.

On various Algæ. Bantry ; *Miss Hutchins.* Kilkee, County of Clare. *Filaments* 3—6 inches long, brilliant green, flaccid. *Branches* straight. The joints are very variable in length ; in some specimens which I have seen they are uniformly short, whence I presume that this, or *C. centralis*, may be the doubtful *C. æruginosa* of Hudson.

37. C. *gracilis*, Griff. MSS. *Graceful Conferva.* Filaments slender, flexuose, silky, much branched, bright yellow-green ; main branches entangled, sparingly divided, angulato-flexuose ; ultimate ramuli pectinato-secund, much attenuated, straight and very long; articulations about 3—5 times longer than broad. *Wyatt. Alg. Danm. No.* 97.

Youghal ; *Miss Ball.* At Wicklow ; *W. H. Harvey. Filaments* 6—12 inches high, forming beautiful tufts of a rich yellow-green colour, glossy when dry ; main filaments remarkably angularly curved, covered with long, slender, delicate, pectinate ramuli, which taper to a fine point. This beautiful plant (which was lately discovered at Torquay by Mrs. Griffiths and Mrs. Wyatt) approaches, in some of its characters, the *C. flexuosa* of Dillw., a native of salt marshes, and by Agardh made a variety of *C. fracta*. The appearance, however, of *C. gracilis* is very different, and, I would hope, it is sufficiently characterized. Whether or not it be the *C. sericea* of Continental authors, I have no means of judging, and dare not decide without reference to authentic specimens. My Irish specimens, while they agree with those from Torquay in all essential particulars, fall short of them in size and beauty.

38. C. *riparia*, Roth. *Entangled shore Conferva.* Filaments elongated, slender, decumbent, pale-green, forming wide strata, flaccid, entangled, angulato-flexuose, slightly branched ; lower branches short, tentacular ; upper long, subsimple, with roundish axils ; articulations 2—4 times longer than broad. *E. Bot. t.* 2100. *Harv. in Hook. Br. Fl. v.* ii. *p.* 359.

On sand-covered rocks, near high-water mark. Bantry; *Miss Hutchins*. *Filaments* very slightly branched, the lower *branches* root-like and sparingly articulated, the upper patent, with remarkably rounded axils.

64. Mougeotia. *Ag.* Mougeotia.

Filaments articulated, simple, finally united by transverse tubes. *Endochrome* granular, at length forming roundish globules at the point of conjugation.—Named in honour of *J. B. Mougeot*, an excellent German botanist.

1. M. *genuflexa*, Ag. *Knee-bent Mougeotia*. Filaments slender, fragile, at length genuflexed and irregularly united by short transverse tubes; endochrome half filling the articulation; globules sphærical. *Ag. Syst. p.* 83. *Harv. in Hook. Br. Fl. v.* ii. *p.* 360.—*Conf. genuflexa, Dillw. t.* 6.

In ditches and pools, forming vast yellowish strata.

65. Tyndaridea. *Bory.* Tyndaridea.

Filaments simple, finally inosculating by transverse tubes. *Endochrome* consisting of two sub-rotund masses *(stellæ)*, which after conjugation unite and form a roundish globule *(sporidium)*, lodged either in one of the articulations, or in the connecting tube.—Name; *Tyndaridæ*, the constellations of *Castor* and *Pollux*, in allusion to the *twin, star-like* globules of the *Endochrome*.

1. T. *cruciata*, Harv. *Cross-like Tyndaridea*. Stellæ roundish; sporidia subglobose, lodged in one of the filaments. *Harv. in Hook. Br. Fl. v.* ii. *p.* 361.—*Conf. bipunctata, Dillw. t.* 2.

In ditches and pools.

2. T. *pectinata*, Harv. *Comb-like Tyndaridea*. Stellæ transversely linear, pectinate; globules contained in the swollen transverse tubes. *Harv. in Hook. Br. Fl. v.* ii. *p.* 361.—*Conf. bipunctata, E. Bot. t.* 1610.

In ditches, &c. with the preceding.

66. Zygnema. *Ag.* Zygnema.

Filaments articulated, simple, finally united by transverse tubes. *Endochrome* forming dotted spiral rings, which after conjugation are condensed into a globule in one of the filaments.—Name; ζυγος, a *yoke*, and νημα, a *thread;* the filaments being yoked together.

1. Z. *nitidum*, Ag. *Shining Zygnema*. Filaments dark

green, parallelly joined; articulations with numerous arching spires. *Harv. in Hook. Br. Fl. v.* ii. *p.* 362.—*C. nitida, Dillw. t.* 4. *f. c. (bad.)*

In ditches, &c.

2. Z. *deciminum*, Ag. *Two-spired Zygnema.* Filaments dark-green, parallelly joined; spires double, cruciate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 362.—*Conf. jugalis, Dillw. t.* 5. *and C. nitida, t.* 4. *f. A. B.*

In ditches, &c. *Spires* double, crossing each other, like a continual multiplication of the Roman numeral X, whence the specific name.

3. Z. *quininum*, Ag. *One-spired Zygnema.* Filaments pale yellow-green, parallelly joined; spires simple. *Harv. in Hook. Br. Fl. v.* ii. *p.* 362.—*Conf. spiralis, Dillw. t.* 3.

In ditches, &c. very common. This is marked with a spiral line, resembling a multiplication of the numeral V. If the length of the *joints*, and the *diameter* of the filaments, be considered specific characters in this genus, it would be easy (as some authors have done) to multiply the species to any extent. Their characters are eminently variable; indeed, in a single specimen, all gradations are often to be found.

Tribe XVIII. SIPHONEÆ.

Plants found in the sea, in fresh water, or on damp ground, of a membranaceous or horny hyaline substance; filled with a green granular matter. Frond tubular, filamentous; the filaments free, or collected into spongy difform fronds, which are either crustaceous, globular, cylindrical, or flat. Fructification: vesicles (conioscystæ) external, often stalked, containing a granular mass.

67. Codium. *Stackh.* Codium.

Frond spongy, dark green (crustaceous, globular, cylindrical, or flat), composed of an interwoven mass of tubular, continuous filaments. *Fructification:* opaque vesicles, attached to the filaments near the surface of the frond.—Name; κοδιον the *skin* of an animal; from the soft nature of the frond.

1. C. *tomentosum*, Stackh. *Tomentose Codium.* Frond cylindrical, dichotomous. *Hook. Br. Fl. v.* ii. *p.* 318.—*Fucus tomentosus, Turn. t.* 135. *E. Bot. t.* 712.

On rocks in the sea, frequent. 6—12 inches long, much branched. Since the publication of the *British Flora*, my friend, Mrs. Griffiths, has been so fortunate as to add another species of this interesting genus to our native list. This is *C. adhærens, Ag. Syst. p.* 178, which forms spreading crustaceous masses of indefinite form or size. Her specimens were gathered at Torquay.

2. C. *Bursa*, Ag. *Pouch Codium.* Frond sphærical, hollow. *Hook. Br. Fl. v.* ii. *p.* 318.—*Fucus Bursa, Turn. Hist. t.* 136.

Very rare. Belfast; *Mr. Templeton.*

68. Bryopsis. *Lamour.* Bryopsis.

Frond membranaceous, filiform, tubular, cylindrical, glistening, branched; the branches imbricated, or distichous and pinnated, filled with a fine green, minutely granuliferous fluid. *Grev.*—Name; βρυον, a *moss*, and ωψις, an *appearance.*

1. B. *plumosa*, Ag. *Feathered Bryopsis.* Frond filiform, branched, naked below, the branches scattered, spreading, twice or thrice pinnated, the pinnæ pectinated. *Grev.*—*Hook. Br. Fl. v.* ii. *p.* 318.—*Ulva plumosa, E. Bot. t.* 2375.

Rocks, &c. in the sea, not rare.

2. B. *hypnoides*, Lamour. *Hypnum-like Bryopsis.* Frond slender, very much branched; the branches long; the ramuli capillary, irregularly inserted, somewhat erect, the lower ones elongated. *Grev.*—*Lamour, Journ. Bot.* 1809. *p.* 135. *t.* 1. *f.* 2. —*B. Arbuscula, Ag. Sp. Alg. v.* i. *p.* 457.

On the sides of rocky pools, left by the receding of the tide. Near Portrush; *Mr. D. Moore.* ☉. Summer and Autumn. Nearly allied to the preceding, depending chiefly for its characters upon the nearly erect irregular ramuli.

69. Vaucheria. *D C.* Vaucheria.

Fronds aggregated, tubular, continuous, capillary, coloured by an internal green pulverulent mass. *Fructification:* dark-green homogeneous *vesicles* (coniocystæ) attached to the frond. *Grev,*—Named in honour of the *Rev. T. P. Vaucher* of Geneva, author of an admirable treatise on Fresh-water Confervæ.—Nine species of this genus are enumerated in Dr. Hooker's British Flora, all of which are probably to be found in Ireland; but I regret, that, never having paid much attention to these plants, I am unable to introduce more than the following five, and for the characters of these I must rely on *Greville* and *Carmichael.*

* *Vesicles solitary.*

1. V. *dichotoma*, Ag. *Large dichotomous Vaucheria.* Filaments dichotomous, fastigiate; the vesicles solitary, globose, sessile. *Grev.*—*Hook. Br. Fl. v.* ii. *p.* 319.—*Conf. dichotoma, Dillw. t.* 15. *E. Bot. t.* 932.

Pools and ditches. About Limerick, &c.

2. V. *velutina*, Ag. *Velvet Vaucheria.* Filaments creeping; branches erect, fastigiate, woven into a velvetty stratum; capsules solitary, lateral. *Carm.—Hook. Br. Fl. v.* ii. *p.* 319.

On the muddy sea-shore. At Miltown Malbay.

3. V. *Dillwynii*, Ag. *Dillwyn's Vaucheria.* Fronds branched, flexuose; vesicles globose, lateral, sessile. *Hook. Br. Fl. v.* ii. *p.* 320.—*Conf. frigida, Dillw. t.* 16.

On the ground, in damp places, common.

4. V. *terrestris*, D C. *Ground Vaucheria.* Filaments straight, forming a lax, somewhat bristly stratum (upon the ground); vesicles lateral, hemisphærical on the side of the horn-shaped peduncle or receptacle. *Grev.—Hook. Br. Fl. v.* ii. *p.* 320.

On the ground, in moist shady places.

* * *Vesicles two or more together.*

5. V. *cæspitosa*, Ag. *Tufted Vaucheria.* Filaments cæspitose; branches secund, fructiferous at the apex; vesicles sessile, globose, intermediate horn-shaped, process straight or curved. *Carm. Hook. Br. Fl. v.* ii. *p.* 321.—*Conf. amphibia, Dillw. t.* 41.

On damp earth, or by the side of ditches, &c.

Tribe XIX. OSCILLATORIEÆ.

Plants growing in the sea, in fresh water, or on damp ground, of a gelatinous substance and filamentous structure. Filaments slender, tubular, continuous, filled with a coloured, granular, transversely striate matter, seldom branched, though often agglutinated together so as to appear branched, usually massed together in broad, floating, or sessile strata of a very gelatinous nature; occasionally erect and tufted, and still more rarely collected into radiating series, bound together by firm gelatine, and then forming globose, lobed, or plane-crustaceous fronds. Fructification: an internal mass, divided by transverse septa, finally separating into roundish or lenticular sporidia.

70. Rivularia. *Roth.* Rivularia.

Frond globose or lobed, rarely incrusting, green or olivaceous, carnose or gelatinous, composed of continuous filaments, annulated within, and surrounded by, or set in, *gelatine.*—Name, in allusion to the habitat of some of the species.

SECT. 1. (*Rivularia*, Roth. *Linkia*, Lyngb.) *Frond verrucæform, rarely incrusting. Filaments close set, sparingly annulated within, mostly dichotomously branched, radiating from a common fixed base.*

1. R. *atra*, Roth. *Black Rivularia.* Fronds minute, scattered, globose, smooth, firm, glossy black; filaments deep green, slender dichotomous. *Harv. in Hook. Br. Fl. v.* ii. *p.* 392. *E. Bot. t.* 1798.

On marine rocks, Algæ, &c. very common.

2. R. *Pisum*, Ag. *Sphærical Rivularia.* Frond globose, smooth, soft, shining, dark-green; filaments dichotomous.—*Berk. Alg. t.* 2. *f.* 2. *Harv. in Hook. Br. Fl. v.* ii. *p.* 392.

On aquatic plants, in sub-alpine streamlets.

3. R. *applanata*, Carm. *Flattened Rivularia.* Fronds minute, gregarious, orbicular, depressed, black; filaments simple, attenuated; the apices free (protruded beyond the gelatine.) *Carm.—Harv. in Hook. Br. Fl. v.* ii. *p.* 392.

On rocks and stones in the sea; first observed by *Captain Carmichael* on the Coast of Scotland.

4. R. *plicata*, Carm. *Wrinkled Rivularia.* Fronds rather large, densely gregarious, gelatinous, compresso-plicate, often hollow and ruptured, dark green; filaments many times dichotomous, attenuated. *Harv. in Hook. Br. Fl. v.* ii. *p.* 392.

On the sea-shore, near high-water mark. Innischerrig Island, Clare.

SECT. 2. (*Scytochloria*, Harv.) *Frond gelatinoso-coriaceous, lobed and bullated or incrusting. Filaments close, densely and conspicuously annulated, set in a firm gelatine, and pointing towards the periphery (not radiating.)*

5. R. *nitida*, Ag. *Shining bullated Rivularia.* Frond large, gelatinoso-coriaceous, lobed and plaited, often bullated, lubricous, shining, deep green; filaments simple or pseudo-branched. *Harv. in Hook. Br. Fl. v.* ii. *p.* 393.—*R. bullata, Berk. Alg. t.* 2. *f.* 1.

On rocks in the sea. Miltown Malbay; *W. H. Harvey.*

6. R. *plana*, Harv. *Green crustaceous Rivularia.* Frond crustaceous, plane, widely spreading, dull-green, lubricous, darker towards the centre; filaments erect, straight, tufted, pale green, subsimple. *Harv. in Hook. Br. Fl v.* ii. *p.* 394.—*Chætophora plana, Ag. Syst. p.* 28.?

On marine rocks. Miltown Malbay.

71. Stigonema. *Ag.* Stigonema.

Filaments tufted, cylindrical, cartilaginous, branched, inarticulate, including granules ranged in transverse dotted rings.—Name; στιγων, *dotted*, and νημα, a *thread*.

1. S. *atro-virens*, Ag. *Black-green Stigonema.* Tufted; branches slightly divided, slender, attenuated, sub-acute; rings three, dotted. *Conf. atro-virens, Dillw. t.* 25.—*Lichen pubescens, E. Bot. t.* 2318. *Bangia atro-virens, Lyngb.*—*St. atrov. Harv. in Hook. Br. Fl. v.* ii. *p.* 368.

Wet rocks in alpine situations, common. Forms broad, rigid, very dark, loose tufts.

2. S. *mammillosum*, Ag. *Mammillated Stigonema.* Branches simple, incrassated, fusiform, densely mammillose. *Ag. Syst. p.* 42. *Harv. in Hook. Br. Fl. v.* ii. *p.* 363.—*Bangia mammillosa, Lyngb. t.* 25. *(very bad.)*

Bottoms of alpine rivulets. At the Eagle's Nest, Killarney.—This forms extensive stratified tufts, and is of a softer and more flaccid substance than the preceding. Under the microscope it is at once recognised by the very peculiar papillate branches.

72. Scytonema. *Ag.* Scytonema.

Filaments branched (very rarely simple), flaccid, tough, continuous, tubular. *Endochrome* brown or olivaceous, transversely striate, "at length separating at the striæ into lenticular sporidia." *Carm.*—Name; σκοτος, a *skin*, and νημα, a *thread;* the filaments are tough.

1. S. *minutum*, Ag. *Dwarf Scytonema.* Filaments minute, erect, rigid, flexuose, fastigiate, collected in a dark crust; branches short. *Harv. in Hook. Br. Fl. v.* ii. *p.* 365.

Rocks in alpine districts. At Carrigataha, near Caher, and at Killarney. This forms dark irregular patches: the *filaments* are about a line in height.

2. S. *myochrous*, Ag. *Mouse-skin Scytonema.* Filaments elongate, mostly decumbent, sub-rigid, flexuose, slender, yellow-brown; branches issuing in pairs, at right angles with the stem. *Harv. in Hook. Br. Fl. v.* ii. *p.* 365.—*Conf. myochrous, Dillw. t.* 19. *E. Bot. t.* 1555.—β. *crinalis;* filaments tufted. *Conf. mirabilis, E. Bot. t.* 2219. *(according to the original specimens, but not C. mirabilis, Dillw. t.* 96.*)*

Alpine bogs and rivulets. β. near Bantry, on *Orthotrichum rivulare; Miss Hutchins.* The geminate divaricating branches and dark brown colour (when dry) well distinguish this species.

3. S. *contextum*, Carm. *Interwoven Scytonema.* Filaments mostly simple, interwoven into a tough olivaceous stratum,

which turns to a dull green in drying. *Carm.—Harv. in Hook. Br. Fl. v.* ii. *p.* 366.

On moist shady rocks, at the foot of Turk Mountain, Killarney.

73. CALOTHRIX. *Ag.* Calothrix.

Filaments (destitute of a mucous layer), erect, tufted or fasciculate, fixed at the base, somewhat rigid, without oscillation. *Tube* continuous; *endochrome* green, densely annulated, at length dissolved into lenticular sporidia.—Name; καλος, *beautiful*, and θριξ, a *hair*.

1. C. *confervicola*, Ag. *Glaucous parasitical Calothrix.* Filaments minute, glaucous, erect, subulate, rigid, fasciculate. *Harv. in Hook. Br. Fl. v.* ii. *p.* 367.—*Conf. confervicola, Dillw. t.* 8. *E. Bot. t.* 2576.

On marine filamentous Algæ, common.

2. C. *scopulorum*, Ag. *Simple Rock Calothrix.* Filaments minute, erect, curved, flexuose, simple, sub-attenuate, dirty-green, agglutinated at the base, forming a continuous velvetty stratum. *Harv. in Hook. Br. Fl. v.* ii. *p.* 368.—*Conf. scopulorum, Dillw. Suppl. t. A. E. Bot. t.* 2171.

On rocks in the sea, near high-water mark, common.

3. C. *fasciculata*, Ag. *Branched Rock Calothrix.* Filaments erect, very straight, dark green, subulate, with a setaceous point, fasciculately pseudo-branched, forming a continuous velvetty stratum. *Harv. in Hook. Br. Fl. v.* ii. *p.* 368.

Marine rocks. Miltown Malbay; rare. Perhaps this is only a more fully developed state of the preceding.

4. C. *interrupta*, Carm. *Variegated Calothrix.* Filaments thick, subulate, coriaceous, glaucous-green, short, cohering in tooth-like fascicles, and forming broad tufts. *Harv. in Hook. Br. Fl. v.* ii. *p.* 368.

On mosses and lichens. Killarney, not rare. 1—2 lines high, forming remarkably tough and rigid tufts.

5. C. *distorta*, Ag. *Large Verdigris Calothrix.* Filaments elongated, bluish-green, forming large tufts, mucous, somewhat rigid, branched; branches erect, flexuose. *Harv. in Hook. Br. Fl. v.* ii. *p.* 369.—*Conf. distorta, Dillw. t.* 22. *E. Bot. t.* 2577.

In ditches, &c. investing aquatic plants. Bantry; *Miss Hutchins. Tufts* an inch long. *Filaments* slender, fine bluish-green.

6. C. *cæspitula*, Harv. *Globular tufted Calothrix.* Filaments forming close convex tufts, blackish-green, flexuose, flaccid, obtuse, here and there spuriously branched. *Harv. in Hook. Br. Fl. v.* ii. *p.* 369.

Marine rocks, very rare. Miltown Malbay. *Tufts* convex, ½—1

inch in diameter, blackish-green. *Striæ* closely set, and strongly marked.

74. Lyngbya. *Ag.* Lyngbya.

Filaments destitute of a mucous layer, free, flexible, elongated, continuous, decumbent. *Endochrome* (green or purple), densely annulated, and finally separating at the annuli into lenticular sporidia.—Named, in honour of *H. C. Lyngbye*, a Danish Algologist, and author of an excellent work on the *Algæ* of Denmark.

1. L. *muralis*, Ag. *Wall Lyngbya.* Filaments somewhat rigid, thickish, tortuous, interwoven into a bright grass-green stratum. *Harv. in Hook. Br. Fl. v.* ii. *p.* 370.—*Conf. muralis, Dillw. t.* 7. *E. Bot. t.* 1554.

On damp walls, very common; and particularly obvious after a shower of rain.

2. L. *majuscula*, Harv. *Large Lyngbya.* Filaments very thick, issuing in long crisped bundles from a blackish-green stratum; tortuous, simple, or slightly pseudo-branched. *Harv. in Hook. Br. Fl. v.* ii. *p.* 370.—*Conf. majuscula, Dillw. Sup. t. A.*

In the sea. Bantry bay; *Miss Hutchins.* Skerries, Portrush; *Mr. D. Moore.*

75. Oscillatoria. *Vauch.* Oscillatoria.

Filaments invested by a common mucous matrix, rigid, elastic, oscillating, simple, continuous. *Endochrome* divided by close, parallel, transverse striæ.—Named from the curious *oscillatory* motions of the filaments.—The species, which are exceedingly numerous and difficult of definition, have hitherto been much neglected by *British*, and but very slightly touched on by *Irish* botanists. The late *Capt. Carmichael*, who studied the genus with great care and success, has added many new and curious species to the Scottish Flora, most of which may probably be found in our own country, if carefully looked after. In the following descriptions the colour of the *strata* always refers to the appearance presented to the naked eye: that of the *filaments*, to what they appear when viewed with a microscope.

* Fasciculatæ; *filaments collected into close, rigid, agglutinated fascicles.*

1. O. *Friesii*, Ag. *Fries' Oscillatoria.* Stratum bright-green, bristling with the elongated, rigid, erect, tooth-like fas-

cicles of filaments. *Harv. in Hook. Br. Fl. v.* ii. *p.* 373.—*Scytonema Bangii, Lyngb.*

On mosses, in alpine situations. At Killarney. *Stratum* 2—3 inches broad. *Filaments* pale green, slender.

2. O. *chthonoplastes*, Hoffm. *Sheathing Oscillatoria.* Stratum dull green; filaments parallel, penicillating from the apex of the decumbent, elongated, flexuose, sheath-like fascicles. *Harv. in Hook. Br. Fl. v.* ii. *p.* 373.—*Conf. vaginata, E. Bot. t.* 1995.

On the muddy sea-shores, or on naked soil by road-sides, &c.

* * Virescentes; *stratum of an æruginose or blue-green colour.*

3. O. *limosa*, Ag. *Green Mud Oscillatoria.* Stratum rich dark-green, glossy, gelatinous, with long rays; filaments green, thick, straight and rigid; striæ strongly marked and very closely set. *Harv. in Hook. Br. Fl. v.* ii. *p.* 374.

Ditches and pools.

4. O. *tenuis*, Ag. *Lesser Mud Oscillatoria.* Stratum rich dark-green, very thin, gelatinous, with short rays; filaments pale green, straight and rigid; striæ distant, not strongly marked. *Harv. in Hook. Br. Fl. v.* ii. *p.* 374.—*Conf. limosa, Dillw. t.* 20.

In muddy ditches, first spreading over the mud; finally rising in scum-like strata to the surface. *Filaments* half the diameter of those of *O. limosa*, and the stratum thinner.

5. O. *decorticans*, Grev. *Ribband Oscillatoria.* Stratum smooth, glaucous-green, membranaceous; filaments very slender, curved, pale, bluish-green; striæ distant. *Harv. in Hook. Br. Fl. v.* ii. *p.* 375.—*Conf. decorticum, Dillw. t.* 26.

Damp walls, rotten timber, &c.

* * * Nigrescentes; *stratum of a dull indistinct green, or inclining to purple, black or brown.*

6. O. *nigra*, Vauch. *Blackish Oscillatoria.* Stratum blackish-green (when dry bluish-black), with long radii; filaments pale bluish-green, thick; striæ very distinct and close. *Harv. in Hook. Br. Fl. v.* ii. *p.* 376.—*Conf. fontinalis, Dillw. t.* 64.

Ditches and ponds, common.

7. O. *autumnalis*, Ag. *Autumnal Wall Oscillatoria.* Stratum purplish or greenish black, very lubricous, shortly radiating; filaments pale bluish green; striæ subdistant. *Harv. in Hook. Br. Fl. v.* ii. *p.* 376.

On damp walls, very common in autumn and winter.

8. O. *corium*, Ag. *Leathery Oscillatoria.* Stratum thick, subcoriaceous, opaque, dull-brownish, streaked with pale-green; filaments yellowish, slender; striæ indistinct, distant. *Harv. in Hook. Br. Fl. v.* ii. *p.* 377.

On the rocky bottoms of alpine rivulets.

9. O. *subfusca*, Vauch. *Brownish-green Oscillatoria.* Stratum dull greyish brown, somewhat streaked with a green shade, soft, void of tenacity; filaments very slender, hyaline, straight; striæ conspicuous. *Harv. in Hook. Br. Fl. v.* ii. *p.* 377.

On rocks and stones in sub-alpine rivulets.

10. O. *ochracea*, Grev. *Fragile Oscillatoria.* Forming floating, cloud-like, very fragile masses of an ochrey colour; filaments scattered, very slender, acicular. *Harv. in Hook. Br. Fl. v.* ii. *p.* 378.—*Conf. ochracea, Dillw. t.* 62.

In boggy pools. Agardh considers this to be some other species in decay; in which opinion he is, perhaps, correct.

Tribe XX. ULVACEÆ.

Plants growing in the sea, in fresh water, or on damp ground, of a membranaceous or gelatinous substance and simple structure. Frond either a tubular or flat, filiform or expanded membrane, or a gelatinous amorphous mass; hyaline, or, owing to the presence of fructification, of a green, purple, or pinkish colour. Fructification: minute green or purple granules, scattered through the frond, or arranged in fours, or in many moniliform, filamentous series. To this family (as understood by Dr. Greville), I have ventured to add the "*Nostochinæ*" of the British Flora. Any one acquainted with these plants must be aware, that though there is much apparent difference between the *extreme* genera (*Porphyra* and *Protococcus*), yet the line, even of *generic* distinction, cannot clearly be defined in the *medial* ones. Thus, *Ulva* insensibly passes to *Tetraspora*, this into *Palmella*, this again into *Flœmatococcus*, which is scarcely different from *Protococcus*. *Nostoc*, I allow, in its moniliformly disposed sporules, presents a somewhat different organization, and perhaps, notwithstanding its strong affinity to *Palmella*, it might with propriety form the type of a distinct family. In structure it appears exactly intermediate between *Palmella* and *Oscillatoria.*

76. Porphyra. *Ag.* Porphyra or Purple Laver.

Frond plane, exceedingly thin, and (owing to the fructification) of a purple colour. *Fructification:* 1. scattered sori of oval

seeds; 2. roundish granules, mostly arranged in a quaternate manner, and covering the whole frond. *Grev.*—Name; *πορφυρος, purple.*

1. P. *laciniata*, Ag. *Torn Purple Laver or Slouk.* Fronds deeply and irregularly cleft, with broad segments; margin variously cut and waved. *Hook. Br. Fl. v.* ii. *p.* 310.—*Ulva umbilicalis, E. Bot. t.* 2296.

On rocks in the sea, common.

2. P. *vulgaris*, Ag. *Simple-waved Purple Laver.* Frond simple, broadly lanceolate, the margin much waved. *Hook. Br. Fl. v.* ii. *p.* 310.

Rocks in the sea with the last, but (in Ireland) much less common.

3. P. *linearis*, Grev. *Narrow Purple Laver.* Frond linear or linear-lanceolate, acute, the margin rarely flat. *Grev.—Hook. Br. Fl. v.* ii. *p.* 311. *Grev. Alg. t.* 18.

Marine rocks; reaching perfection in the winter months. Dunmore, near Waterford; *Miss A. Taylor.* Miltown Malbay.—A beautiful and distinct species, 3—5 inches high, and rarely half an inch broad.

77. Bangia. *Lyngb.* Bangia.

Frond flat, capillary, membranaceous, of a green, reddish or purple colour. *Fructification: granules* arranged more or less in a transverse manner. *Grev.*—Named in honour of *Hoffman Bang*, a Danish Naturalist.

1. B. *fusco-purpurea*, Lyngb. *Brownish-purple Bangia.* Filaments elongated, decumbent, nearly straight, equal, forming a brownish or purple stratum, glossy; granules few (about 5) in each fascia. *Hook. Br. Fl. v.* ii. *p.* 316.—*Conf. fusco-purpurea, Dillw. t.* 92. *E. Bot. t.* 2055. *also C. atro-purpurea, Dillw. t.* 103. *E. Bot. t.* 2085.

Marine rocks, rare. Bantry; *Miss Hutchins.*

2. B.? *lætevirens*, Harv. *Bright-green Bangia.* Filaments minute, tufted, flexuose, attenuated to a sub-obtuse point, bright-green; fasciæ close, composed of innumerable minute granules. *Harv. in Hook. Br. Fl. v.* ii. *p.* 317.

On old fronds of *Enteromorpha intestinalis*, near high-water mark, Miltown Malbay.

3. B.? *Laminariæ*, Lyngb. *Laminaria Bangia.* Filaments simple, cæspitose, equal, olive-green; granules minute, arranged in a double series of about four. *Hook. Br. Fl. v.* ii. *p.* 316. *Lyngb. Dan. t.* 24.

Parasitical on *Alaria esculenta* at Arran; *Mr. R. Ball* and *Mr. W. Thompson.*

78. Enteromorpha. *Link.* Enteromorpha.

Frond tubular, hollow, membranaceous, of a green colour and reticulated structure. *Fructification:* three or four roundish *granules*, aggregated in the reticulations. *Grev.*—Name; εντερον, the *entrail*, and μορφη, a *form* or *appearance*.—This genus chiefly differs from *Ulva* in its tubular and much branched frond.

1. E. *intestinalis*, Link. *Intestinal Enteromorpha.* Fronds elongated, broadly linear, inflated and sinuated, simple (often floating.) *Grev. Hook. Br. Fl. v.* ii. *p.* 314.

On the shore, and in ditches and pools, both of salt and fresh water.

2. E. *compressa*, Grev. *Compressed Enteromorpha.* Frond tubular, linear or filiform, simple or branched, subcompressed, the branches elongated, attenuated at the base. *Grev. Hook. Br. Fl. v.* ii. *p.* 314.

Sea-shores, common.

3. E. *clathrata*, Grev. *Latticed Enteromorpha.* Frond much and irregularly branched, slender, filiform, reticulated; branches attenuated to a fine point. *Grev. Alg. Br. p.* 181. *Hook. Br. Fl. v.* ii. *p.* 318. *(also E. erecta, and E. ramulosa, Hook. l. c.)—Conf. paradoxa, Dillw. E. Bot. t.* 2328.—*Ulva ramulosa, E. Bot. t.* 2137.

Sea-shores. This is distinguished by its latticed frond, and attenuated branches.

79. Ulva. *Linn. (part of.)* Ulva, or Laver.

Frond membranaceous, of a green colour, plane (in some cases saccate, and inflated in the young state.) *Fructification:* minute *granules*, mostly arranged in fours. *Grev.*—Name; supposed to be from *Ul*, *water*, in Celtic.

* *Marine.*

1. U. *latissima*, Linn. *Broad Ulva or Laver.* Frond broadly ovate or oblong, flat, delicately membranaceous, of a full-green colour. *Hook. Br. Fl. v.* ii. *p.* 311.—*U. Lactuca, E. Bot. t.* 1551.

Rocks and stones in the sea, very common.

2. U. *Lactuca*, Linn. *Lettuce green Laver.* Frond at first obovate, saccate, inflated, at length cleft down to the base, the segments plane, unequal, laciniate, semi-transparent. *Grev.—Hook. Br. Fl. v.* ii. *p.* 311.

Rocks, &c. in the sea. *Substance* very delicate, adhering firmly to paper.

3. U. *Linza*, Linn. *Ribband green Laver.* Frond linear-lanceolate, acute, undulate at the margin, composed of two membranes closely applied. *Harv. in Hook. Br. Fl. v.* ii. *p.* 311.

Rocks and stones in the sea. The double membrane of this species closely allies it to the genus *Enteromorpha;* from which, indeed, it rather differs in habit than by any distinct character.

* * *Found in fresh water.*

4. U. *bullosa*, Roth. *Blistered Ulva.* Frond very delicate, somewhat gelatinous, at first saccate, afterwards becoming expanded into a broad, waved or torn floating membrane. *Hook. Br. Fl. v.* ii. *p.* 312. *E. Bot. t.* 2320.

In stagnant fresh-water pools and ditches. This species scarcely differs in its frond and fructification from *Tetraspora*, and, indeed, there are some varieties very difficult to be distinguished from *T. lubrica.* Dr. Hooker hints, that it may be only *U. Lactuca*, altered by growing in fresh water. It is impossible to say whether or not this opinion be correct, for in plants of such low organization, when *place of growth* constitutes a specific character, the difference between *species* and *varieties* is often so vague, that we are forced, in many cases, to rest content with a random guess.

* * *Grow on damp ground, walls, rocks, paling, &c.*

5. U. *crispa*, Lightf. *Crisped Ulva.* Fronds saccate, firm, densely cæspitose, plaited and wrinkled, of a roundish form. *Hook. Br. Fl. v.* ii. *p.* 312.

On damp walls, the thatched roofs of cottages, &c. very common.

6. U. *calophylla*, Spreng. *Beautiful Ulva.* Fronds densely cæspitose, plane, lineari-ligulate, attenuated at base (often stipitate), longitudinally striate, each striæ marked with a series of bi-quaternate granules. *Hook. Br. Fl. v.* ii. *p.* 312.—*Bangia calophylla, Carm. in Grev. Crypt. t.* 220.

On damp stones, walls, &c. On a damp window-stone in the City of Limerick, gathered in abundance in the month of February; *W. H. Harvey.* A highly beautiful and curious plant. *Frond* 3—4 lines long, rising from a filiform, cylindrical, (?) often elongated stipes, from which it suddenly expands into a strap-shaped or narrow oblong membrane. *Dr. Greville* does not notice this stipes, except in calling the fronds "attenuated at the base." In many instances I allow they are gradually attenuated, but in others I have distinctly seen them suddenly expand from a filiform and *apparently* cylindrical stem, which is transversely fasciate, and, indeed, strongly resembles the filament of *Lyngbya speciosa.* If this stem be truly cylindrical, *U. calophylla* is brought still closer to *U. velutina.* I may also remark, without wishing to favour the opinion, that the supposed transmigration of this species into *Lyngbya muralis*, (which Agardh ridicules in the second vol. of his *Species Algarum, Introd. p.* xlv.) may be accounted for

by supposing that this stipes has been noticed by those who hold such opinions.

7. U. *furfuracea*, Horn. *Furfuraceus Ulva.* Fronds very minute, roundish, ovate, distinct, sub-erect, forming a thin crowded stratum; sporidia large, mostly in fours. *Hook. Br. Fl. v.* ii. *p.* 312. *Grev. Crypt. Fl. t.* 265.

On damp walls, &c. in several places about Limerick; *W. H. Harvey.*

80. Tetraspora. *Link.* Tetraspora.

Frond tubular, inflated or plane, gelatinoso-membranaceous, of a green colour. *Fructification:* minute *granules*, mostly arranged in fours.—Name; τετρα, *four*, and σπορα, a *seed*; from the arrangement of the sporules.

1. T. *gelatinosa*, Desv. *Gelatinous Tetraspora.* Frond vesicular, ovate, clavate, very gelatinous. *Ag. Hook. Br. Fl. v.* ii. *p.* 313.

Fresh water stream at Mucruss, Killarney. *Fronds* exceedingly lubricous and gelatinous, but firm, delicately waved and plaited, of an ovate outline, attached to water plants. *Sporules* arranged in fours, or irregularly scattered.

2. T. *lubrica*, Ag. *Lubricous Tetraspora.* Frond quite simple, tubular, gelatinous, waved and sinuated. *Hook.—Hook. Br. Fl. v.* ii. *p.* 313.

In running fresh water. Castlemartyr; *Miss Ball.* Larger than the preceeding, less gelatinous, with a more distinct membrane.

81. Palmella. *Lyngb.* Palmella.

Plant a polymorphous gelatinous mass, filled with scattered globular or elliptical *granules.*—Name; παλμος, *vibration*; from the loosely gelatinous nature of these plants.—The granules are sometimes arranged in fours, in which case the line of distinction between *Palmella* and *Tetraspora* vanishes.

1. P. *protuberans*, Ag. *Soft shapeless Palmella.* Gelatine thick, irregularly lobed, very soft, green; granules elliptical. *Harv. in Hook. Br. Fl. v.* ii. *p.* 396. *Grev. Crypt. Fl. t.* 243. *f.* 1.—*Ulva protuberans*, *E. Bot. t.* 2583.

Moist rocks, among mosses.

2. P. *cruenta*, Ag. *Purple Palmella.* Frond crust-like, indeterminate, very thin, of a full red colour. *Grev. Crypt. Fl. t.* 205.—*Tremella cruenta*, *E. Bot. t.* 1800.

On moist limestone or white-washed walls, frequent in cellars.

3. P. *botryoides*, Lyngb. *Small clustered Palmella.* Minute; fronds densely crowded, globose, somewhat lobed, green,

sub-orbicular; granules elliptical. *Grev.—Crypt Fl. t.* 243. *f.* 2. *Harv. in. Hook. Br. Fl. v.* ii. *p.* 396.

In heathy places, in moist situations.

4. P. *hyalina*, Lyngb. *Green pellucid Palmella.* Frond globose or somewhat elongated, pellucid green, the granules globose, green. *Grev.—Grev. Crypt. Fl. t.* 247. *Harv. in Hook. Br. Fl. v.* ii. *p.* 397.

In fresh water streams, &c.

82. Nostoc. *Vauch.* Nostoc.

Frond gelatinous, or coriaceous, lobed, hollow, or solid; filled with crisped, moniliform *filaments*, which are finally dissolved into sporules.—Name, of unexplained meaning.—This genus differs from *Palmella*, solely in the filamentous arrangement of the sporules. To *Berkeley's* genus *Monormia (Gr. Alg. p.* 46. *t.* 18.*)* it is still more closely allied, but appears sufficiently distinct.

1. *Olive-green, terrestrial.*

1. N. *commune*, Vauch. *Common Nostoc.* Terrestrial; frond expanded, polymorphous, plicato-undulate green. *Harv. in Hook. Br. Fl. v.* ii. *p.* 398.—*Tremella Nostoc, E. Bot. t.* 461.

Gravelly soils, among rocks, &c. after rain.

2. N. *foliaceum*, Ag. *Leafy Nostoc.* Cæspitose, membranaceous, plicato-rugose, somewhat erect. *Ag. Syst. p.* 19. *Harv. in Hook. Br. Fl. v.* ii. *p.* 399.

On clayey, moist ground.

3. N. *microscopicum*, Carm. *Minute Nostoc.* Fronds densely aggregated, very minute, polymorphous, immersed in a blackish crust. *Harv. in Hook. Br. Fl. v.* ii. *p.* 399.

On rocks, and among mosses. At the "Wilderness," Clonmel. *Fronds* exceedingly minute, hyaline or pale olive, of various shapes, containing a few, lax, moniliform filaments.

2. *Olive-green, submersed.*

4. N. *verrucosum*, Vauch. *Plaited Nostoc.* Fronds large, gregarious, confluent, subglobose, plaited, at length hollow, blackish green. *Harv. in Hook. Br. Fl. v.* ii. *p.* 400.

On stones in alpine rivulets.

83. Protococcus. *Ag.* Protococcus.

Plant consisting of aggregated, naked *globules*, filled with mi-

nute *granules*, and sessile on a transparent gelatinous mass.—Name; πρωτος, *first* or primary, and κοκκος, *fruit*; from its elementary organization.

1. P. *nivalis*, Ag. *Crimson Protococcus or Red-Snow.* Globules exactly sphærical, very minute, fine purple red, gelatinous mass, pale, spreading. *Grev.—Crypt. Fl. t.* 231. *(admirable.) Ag. Syst. and Alg. Europ. t.* 21. *Harv. in Hook. Br. Fl. v.* ii. *p.* 395.—*Hæmatococcus Grevillii, Ag. Alg. Europ. t.* 23.

On slightly inundated rocks in various places; as about Dublin, Limerick, and near Miltown Malbay. This forms stain-like patches on the surface of the rock, or spreads over decaying leaves and sticks. In the Arctic regions, and on several of the high mountains of Europe, it covers the surface of the snow in vast strata, in some places penetrating to the depth of twelve feet. I have carefully compared specimens sent by Professor Agardh from Sweden with those gathered in this country, and find them to agree in every particular.

Tribe XXI. BYSSOIDEÆ.

Plants of doubtful affinity, related to the Fungi. Filaments articulated, hyaline or coloured. Fructification very obscure. They are found on rotten wood, among mosses, on damp ground, on glass, or in chemical solutions, and in other anomalous situations.

84. Byssocladium. *Ag.* Byssocladium.

Filaments arachnoid, radiating from a centre, with scattered external granules.—Name; βυσσος, a *fungus*, and κλαδος, a *branch.*

1. B. *fenestrale*, Ag. *Window Byssocladium. Harv. in Hook. Br. Fl. v.* ii. *p.* 379.—*Conf. fenestralis, Dillw. t.* 94.

Very common on window-panes and damp glass, on which it forms orbicular whitish spots.

85. Croolepus. *Ag.* Croolepus.

Filaments rigid, subsolid, opaque, erect, minute, falling to powder; joints often contracted.—Name; χροος, a *skin*, and λεπω, to *decorticate.*—This genus, as defined by Agardh, contains two very distinct tribes, one of which, at least, ought to be removed to the Fungi.

1. *Orange or yellow-green; fruit roundish capsules.* (Amphiconium, *Spr.*)

1. C. *aureus*, Harv. *Orange Croolepus.* Filaments forming

soft cushion-like tufts, flexuose, irregularly branched, yellow-green or orange; articulations twice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 380.—*Trentepohlia aurea, Ag. Syst. p.* 36. *Conf. aurea, Dillw. t.* 35. *Byssus aurea, E. Bot. t.* 212.

On rocks and old trees, common.

2. C. *Jolithus*, Ag. *Orange-red Croolepus.* Filaments tufted, erect, very short, orange-red, dichotomous; articulations once and half as long as broad. *Ag. Syst. p.* 34. *Harv. in Hook. Br. Fl. v.* ii. *p.* 380.

On rocks, in woods, &c.

3. C. *lichenicolus*, Ag. *Parasitical Croolepus.* Tufts red-orange; filaments erect, fasciculated, alternately branched, rigid; articulations slightly tumid, as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 381.—*Conf. lichenicola, E. Bot. t.* 1609.

On Lichens and old trees. To me the three species of this section appear to be merely varieties of one species.

2. *Black, torulose; bearing clavate bodies resembling sporidia.*—(Helmisporium?)

4. C. *ebenea*, Ag. *Black Croolepus.* Filaments branched, erect, tufted, rigid, sub-cartilaginous, black, obtuse; articulations as long as broad. *Ag. Syst. p.* 36. *Harv. in Hook. Br. v.* ii. *p.* 381.—*Conf. ebenea, Dillw. t.* 101. *Byssus nigra, E. Bot. t.* 702.

On rocks and trees, in alpine districts.

86. Protonema. *Ag.* Protonema.

Filaments sub-articulated, branched, rooting, mostly green.—Name; πρωτος, *first* or *primary*, and νημα, a *thread*.—These obscure plants are probably rudimentary mosses.

1. P. *umbrosum*, Ag. *Shaded Protonema.* Stratum velvetty-green; filaments erect, obtuse, fastigiate, fragile; articulations gibbous. *Ag. Syst. p.* 43. *Harv. in Hook. Br. Fl. v.* ii. *p.* 383.—*Conf. umbrosa, Dillw. t.* 61.

On moist ground.

2. P. *cryptarum*, Ag. *Cave Protonema.* Filaments dichotomous, green; branches divaricating, acuminated; articulations thrice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 393.—*Conf. cryptarum, Dillw. Syn. t. D. E. Bot. t.* 2588.

In caves in the North of Ireland; *R. Brown, Esq.* and *Mr. Templeton.*

3. P. *Orthotrichi*, Ag. *Parasitical Protonema.* Filaments olivaceous, minute, branched, obtuse, erect; articulations about

as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 383.—*Conf. Orthotrichi, Dillw. t.* 89. *Conf. muscicola, E. Bot. t.* 1638.

On the leaves of various *Orthotricha*, common.

4. P. *muscicola*, Ag. *Chestnut-coloured Protonema.* Filaments brown, branched; branches alternate, divaricate, subulate; articulations thrice as long as broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 383.—*Conf. castanea, Dillw. t.* 72. *E. Bot. t.* 1701.

87. Hygrocrocis. *Ag.* Hygrocrocis.

Filaments hyaline, interwoven into an uniform membrane or gelatine. (Inhabit chemical solutions.)—Name; *ὑγρος, belonging to water*, and *κροκις*, a *little tuft.*

1. H. *Atramenti*, Ag. *Ink Hygrocrocis.* Filaments dichotomously branched, minute, decumbent, densely interwoven in a white stratum; articulations longer than broad. *Harv. in Hook. Br. Fl. v.* ii. *p.* 384.

On the surface of ink, very common. The remaining British species, which are found in solutions of muriate of barytes, of gum dragon, and of isinglass size, in rose-water and in Madeira wine, may probably be found in this country, but, as I have not seen *native specimens* (! !), I decline introducing them.

88. Leptomitus. *Ag.* Leptomitus.

Filaments hyaline, erect, parasitical, growing in fresh water or in the sea.—Name; *λεπτος, slender*, and *μιτος*, a *thread.*—These minute organizations usually grow on decaying animals.

1. L. *lacteus*, Ag. *White Leptomitus.* Filaments branched, clustered in a shapeless gelatinous mass, dirty-white; branches from each dissepiment; articulations very long. *Ag. Syst. p.* 48. *Harv. in Hook. Br. Fl. v.* ii. *p.* 385.—*Conf. lactea, Dillw. t.* 79.

In ditches and rivulets, on stones, wood, &c. I have observed it in ditches near the College Botanic Garden, Dublin, and about Mountmellick, Queen's County.

2. L. *clavatus*, Ag. *Club-shaped Leptomitus.* Filaments simple, hyaline; apex clavate. *Ag. Syst. p.* 49. *Harv. in Hook. Br. Fl. v.* ii. *p.* 385.

On rotten fishes and dead flies (!).

Div. IV. DIATOMACEÆ.*

Granules (frustula) of various forms, plane or compressed, more or less hyaline or transparent, rigid and fragile, in parallel series or circles, free, naked, or imbedded in a mucous mass or gelatinous frond, at length separating into definite segments.—Small, often very minute plants, in the sea or in fresh water, mostly parasitic, or forming floating masses, or mixed with other aquatic vegetables. *Grev.*

Tribe XXII. DESMIDIEÆ.

Filaments cylindrical or angular, at length separating into segments (frustula.) Grev.

89. Meloseira. *Ag.* Meloseira.

Frustula forming simple, pseudo-articulated *filaments*, constricted at the articulations, fragile, easily separating. *Grev.* —Name; μελος, a *membrane*, and σειρα, a *chain;* in reference to the form of the filaments.

1. M. *lineata*, Ag. *Striated Meloseira.* Filaments fragile, contracted at the articulations, transversely striated with one or two fine lines, the joints 2—3 times longer than they are broad. *Grev.—Grev. in Hook. Br. Fl. v.* ii. *p.* 402.—*Conf. lineata, Dillw. p.* 44. *t. B.*

In streams and ditches, floating in dark-brown masses. At Plassey, near Limerick; *W. H. Harvey.* The *Endochrome*, a brown colouring matter of the joint, becomes finally parted into two distinct masses of a roundish oblong figure.

Tribe XXIII. FRAGILARIEÆ.

Filaments plane, extremely fragile, composed of rectilinear frustula. (Frustula sometimes apparently radiating from a centre, and not presenting the appearance of a filament.) Grev.

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* Irish Botanists have scarcely attended to this minute but curious tribe of Plants, (we have yet had no *Carmichael* or *Greville* amongst us); and I am ashamed to say, that out of fifty-seven British species—most, if not all, of which are probably natives of Ireland—I can only claim eighteen as having a right to a place in our Flora. Of the following *British* genera no species has hitherto been noticed in our rivers, or on our shores: *Desmidium, Achnanthes, Styllaria, Homœocladia, Berkeleya, Micromega,* and *Cymbella.* Not being very conversant with these plants, I have, in the following descriptions, adhered to Dr. Greville's words in *Hook. Brit. Flora, vol.* ii. *p.* 401, *et seq.*

90. Fragilaria. *Lyngb.* Fragilaria.

Frustula forming plane, pseudo-articulated, densely striated, fragile *filaments*, separating at the striæ (not cohering at their angles.)—Name, from their *fragile* character. *Grev.*

1. F. *pectinalis*, Lyngb. *Pectinated Fragilaria.* Filaments rigid, attenuated, densely striated, the joints 3—4 times broader than they are long. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 403. —*Conf. pectinalis, Dillw. t.* 24. *E. Bot. t.* 1611.

Rivers and stagnant waters. Near Limerick; *W. H. Harvey.*

91. Diatoma. *Ag.* Diatoma.

Frustula forming pseudo-articulated, plane *filaments*, at length separating and cohering at their angles.—Name; διατομη, *incision;* from the divisions as far as the angles, which cohere. *Grev.*

* *Frustula (or joints) rounded.*

1. D. *auritum*, Lyngb. *Auriculated Diatoma.* Filaments yellow, the joints quadrate, rounded, with an auricle at each angle. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 404. *Lyngb. Hyd. Dan. p.* 182. *t.* 62.

Very rare. At Youghal parasitic on *Cal. polyspermum*; *Miss Ball.*

2. D. *obliquatum*, Lyngb. *Oblique-jointed Diatoma.* Filaments short, unequal, the joints half as long again as they are broad, punctate, and transversely banded. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 405.—*Conf. obliquata, E. Bot. t.* 1869.

Parasitic on marine Algæ: very rare. Ardinairy Point, Wicklow, on *Griffithsia simplicifilum; W. H. Harvey.*

* * *Frustula (or joints) square, (not rounded.)*

3. D. *striatulum*, Ag. *Banded Diatoma.* Filaments somewhat curved, pellucid at the articulations, the joints nearly as long as they are broad, densely and transversely striated. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 405.—*Conf. striatula, E. Bot. t.* 1928.

Parasitic on marine Algæ, particularly *Cladostephus spongiosus and verticillatus;* not uncommon. A very handsome species, with curved glossy filaments half an inch or more in length.

4. D. *marinum*, Lyngb. *Tænia-like Diatoma.* Filaments unequal, the joints longer than they are broad, with a trans-

verse granular yellow mass. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 406. *Lyngb. Hyd. Dan. p.* 110. *t.* 62.

Parasitic on small Algæ in the sea, very common ; investing them with a dense pulverulent covering.

5. D. *elongatum*, Ag. *Elongated Diatoma.* Filaments with a longitudinal line, the joints ten times longer than they are broad. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 407. *Berk. Brit. Alg. p.* 21. *t.* 6.

In pools and ditches, scattered among various *Confervæ.* Near Limerick ; *W. H. Harvey.*

6. D. *flocculosum*, Ag. *Flocculose Diatoma.* Filaments with a longitudinal pellucid line, the joints transversely striated, nearly equal in length and breadth. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 407.—*Conf. flocculosa, Dillw. t.* 28. *E. Bot. t.* 1761.

Pools, ditches, &c. ; parasitic on various *Confervæ.*

* * * *Frustula fasciculate or flabelliform.*

7. D. *fasciculatum*, Ag. *Fasciculated Diatoma.* Frustula linear, somewhat acuminate at each extremity. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 407.—*Echinella fasciculata, Grev. Crypt. Fl. t.* 16. *f.* 1—3.

On marine Algæ, frequent.

8. D. *truncatum*, Grev. *Truncate Diatoma.* Frustula linear, truncate at the extremity. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 487.—*Echinella fasciculata, β. Grev. Crypt. t.* 16. *f.* 4.

Pools and ditches, on various *Confervæ*, common.

92. FRUSTULIA. *Ag.* Frustulia.

Frustula linear, free or imbedded in a shapeless mass, solitary or binate. *Grev.*—Name, *frustula, fragments*, of which this plant is wholly composed.

1. F. *fasciata*, Ag. *Banded Frustulia.* Frustula 8—10 times longer than broad, binate or solitary, obtuse, terminated at each end by a hyaline globule ; dull ochre with a hyaline central band. *Ag. Conspect. Crit. Diat. p.* 45.

In fresh water, mixed with other Algæ. Plassey ; *W. H. Harvey.*

2. F. *Ulna*, Ag. *Acicular Frustulia.* Frustula linear, exceedingly slender, acicular, obtuse, marked with interrupted ochraceous bands. *Ag. Consp. Crit. Diat. p.* 45.

In fresh water, mixed with other Algæ. Plassey, near Limerick ; *W. H. Harvey.* The *frustula* are often of an uniform ochraceous colour, except the apices, which are always hyaline.

Tribe XXIV. STYLLARIEÆ.

Frustula plane, wedge-shaped.

93. Licmophora. *Ag.* Licmophora.

Frustula wedge-shaped, flabelliform, stipitate. *Grev.*—Name; λικμοφορος, *fan-bearer.*

1. L. *flabellata*, Ag. *Flabellate Licmophora.* Densely tufted; when dry green and glistening; stipes elongated, very much branched; branches alternate; the frustula linear, wedge-shaped, flabelliform. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 409.—*Exilaria flabellata, Grev. Crypt. Fl. t.* 289.

Parasitic on marine *Algæ* and *Zostera.* Bantry bay; *Miss Hutchins.* One of the most beautiful microscopic objects in the whole order of Algæ, and admirably represented in Dr. Greville's figure in the *Scot. Crypt. Flora.* It forms glistening tufts, half an inch in height.

94. Meridion. *Ag.* Meridion.

Frustula wedge-shaped, in plain sessile circles or segments of circles.—Name; μερις, ιδος, a *portion* or *particle;* in allusion to the minute fragments which compose it. *Grev.*

1. M. *circulare*, Ag. *Circular Meridion.* Mucose stratum scarcely any; frustula united into numerous nearly complete circles. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 409.—*Echinella circularis, Grev. Crypt. Fl. t.* 35.

Stagnant waters, among other Algæ. Plassey, near Limerick; *W. H. Harvey.*

Tribe XXV. CYMBELLEÆ.

Frustula elliptical.

95. Gomphonema. *Ag.* Gomphonema.

Frustula subgeminate, terminating a very slender, simple or branched *filament.*—Name; γομφος, a *wedge*, and νημα, a *thread;* from the shape of the frustules of the filaments. *Grev.*

1. G. *minutissimum*, Grev. *Smallest Gomphonema.* Minute, ochraceous, somewhat scattered, entangled; stipes subramose; frustules linear, wedge-shaped. *Grev.*—*Grev. in Hook. Br. Fl. v.* ii. *p.* 409. *and Crypt. Fl. t.* 244. *f.* 1.

In streams, &c. investing the leaves of grasses, common.

2. G. *paradoxum*, Ag. *Doubtful Gomphonema.* Aggregated, yellow; stipes erect, dichotomous; the frustula wedge-shaped, somewhat corymbose. *Grev.—Grev. in Hook. Br. Fl. v.* ii. *p.* 410.—*Echinella paradoxa, Grev. Crypt. t.* 25.

Parasitic on small marine Algæ; common. Scarcely of this genus, and, perhaps, more allied both in habit, and in the shape of the *frustula*, to *Licmophora.*

96. SCHIZONEMA. *Ag.* Schizonema.

Frustula in longitudinal series, and enclosed in a simple or branched filiform mucous, or membranaceous *frond.*—Name, *σχιζω, to divide*, and *νημα*, a *thread;* in allusion to the separation of the frustules. *Grev.*

1. S. *comoides*, Ag. *Tufted Schizonema.* Filaments in lax tufts, capillary, branched; branches nearly simple, elongated. *Grev.—Grev. in Hook. Br. Fl. v.* ii. *p.* 413.—*Conf. comoides, Dillw. t.* 27.

On rocks and corallines in the sea. Malbay; *W. H. Harvey.* I confess myself imperfectly acquainted with this species—I may say with the whole genus—and refer my Irish specimens, with much hesitation, to the above figure.

2. S. *Smithii*, Ag. *Sir J. E. Smith's Schizonema.* Filaments tufted, gelatinous, irregularly branched; branches spreading, acute; frustula oblong, in numerous parallel series, geminate, at length separating. *Grev.—Grev. in Hook. Br. Fl. v.* ii. *p.* 414. *Grev. Crypt. t.* 298.—*Ulva fœtida, E. Bot. t.* 2101.

On rocks &c. in the sea. Bantry Bay; *Miss Hutchins.*

I wish to take this opportunity of introducing to the notice of Irish Botanists a most useful collection of dried specimens of Algæ, now in course of publication by Mrs. Mary Wyatt, at Torquay; and I have pleasure in stating, that my valued friend, Mrs. Griffiths, (whose name is a sufficient guarantee for the correctness of the synonyms,) has kindly taken on herself the naming and arranging of all the species. Three quarto volumes, containing *One hundred and fifty* species, have already made their appearance under the title of "ALGÆ DANMONIENSES; *or dried specimens of Marine Plants, principally collected in Devonshire:*" a fourth may be expected in the course of next year. The specimens are not only beautifully preserved and displayed, but in most cases, where a species produces a *secondary* or diœcious fructification, individuals are given presenting each mode of fruit; and so great has been the care bestowed on the selection of species, that a very large number of the rarest and least known of British Algæ may be found in these volumes. Amongst others, the following may

be noticed: Fucus *tuberculatus;* Sporochnus *villosus, pedunculatus;* Asperococcus *compressus, pusillus, Turneri;* Punctaria *latifolia;* Cutleria *multifida;* Nitophyllum *ulvoideum, ocellatum, Gmelini;* Rhodomenia *polycarpa;* Gigartina *compressa, Teedii, erecta;* Microcladia *glandulosa;* Grateloupia *filicina;* Chætospora *Wiggii;* Codium *adhærens;* Ectocarpus *Mertensii;* Myriotrichia *clavæformis;* Spyridia *filamentosa;* Callithamnion *roseum, gracillimum, spongiosum, lanosum, polyspermum;* Polysiphonia *elongella;* Bryopsis *hypnoides;* Conferva *gracilis, centralis, uncialis, rectangularis:* Mesogloia *coccinea, purpurea, Hudsoni;* Trichocladia *Griffithsiana, virescens;* Lyngbya *majuscula;* and many others. The work may be had on application to Mary Wyatt, Dealer in Shells, &c. Torquay, Devonshire. *W. H. Harvey.*