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XLIV.—On the British Diatomaceæ

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There are specimens in the British Museum collection varying from three-quarters of an inch to a whole inch in length. This species or variety comes very near the *S. gigas*, Leach, 'Edw. Crust.' iii. p. 205, from which it principally differs in the more elongated and narrower outer plate, and in the grooved elevation at the base of the more arched last joint of the abdomen.

11. *Scrolis paradoxa* (Fabr. spec.), Leach.

Mr. Wright informed me, on his return from the Falkland Islands, that this singular flat crustaceous animal is very common in the Carnash, Berkley Sound, Falkland Islands; it is found in shallow places with a bottom of light sand and mud, among which it burrows, and in which, when disturbed, it buries itself very rapidly. He assured me he had seen specimens at least six inches long. This species was first found by Sir Joseph Banks on one of Cook's voyages, off the coast of Tierra del Fuego. We have one specimen in the Museum labelled as coming from Senegal, the others were given by Mr. Wright from the locality above mentioned.

XLIV.—On the British Diatomaceæ. By JOHN RALFS, Esq., M.R.C.S., Penzance*.

[Continued from p. 276.]

[With a Plate.]

MELOSEIRA, Ag. (GALLIONELLA, Eh.)

Filaments cylindrical, siliceous, jointed, fragile; one or two lines passing round each frustule near its centre.

This genus in its cylindrical filaments differs from the other *Cymbelleæ*, and thus connects them with the *Conserveæ*; but it agrees with them in being generally of a brown or yellowish colour when recent, and especially in its siliceous filaments and in the presence of striæ; characters which sufficiently point out the propriety of its present situation amongst the *Diatomaceæ*.

The filaments have no proper margins marked by distinct characters as in the other genera of the *Cymbelleæ*; and the striæ when present on the junction-surfaces are not transverse but radiated.

The cylindrical form of the filaments, and also the other differences just mentioned, compel me, in describing this genus, to use the terms length and breadth in the sense in which they are applied to a *Conferva*, and consequently in one the reverse of that which they have in respect of the other genera of this family.

This genus may be divided into two sections, which differ in several respects.

- Read before the Botanical Society of Edinburgh.

In the first section, the species belonging to which are generally marine, the ends of the frustules are convex, and as there are no distinct junction-surfaces, a moniliform appearance is produced. The central line is more strongly marked in this than in the other section, and seems to divide the frustule into two equal portions. It becomes broader and then double, and at length an intermediate growth separates the two halves of the frustule, which during this process do not increase in size; but when the intermediate space is equal to the diameter of the original frustule, two new frustules are formed by the addition of two hemispheres on the inner sides of the separated portions. The outer siliceous covering still remaining, the frustules are connected in pairs, and appear like two globules within a joint, as they are characterized by Harvey in *M. nummuloides*, and by Carmichael in *M. globifera*. The above description belongs more particularly to *M. nummuloides*, but the process in the other species in the first section is the same. Mr. Dalrymple first called my attention to this singular mode of growth. In a letter he remarks on *M. nummuloides*, that "the joints of the *Meloseira* are not only united end to end, but sometimes two corpuscles are included within the same boundary-line, while others are disjointed as it were and merely united end to end. This I believe arises from the mode of reproduction, and that each corpuscle is capable of dividing into two bodies within its original siliceous shell." A series of changes nearly similar in *Isthmia* has been already described*.

All the species in the other section are found in fresh water. The frustules are not united in pairs, their junction-surfaces are distinct and nearly flat, and their central lines are probably furrows; hence whatever parts of these lines occupy the margin of the field of view, as the filaments are turned round, they all appear like puncta.

M. lentigera, Harv., evidently belongs to the first section, but I have seen no specimen, and cannot refer it to any species with which I am acquainted.

Through the kindness of Mr. W. Thompson I have been enabled to examine a specimen of "*Meloseira Thompsoni*" marked by Mr. Harvey himself. This beautiful and interesting plant appears to me to be a species of *Sphæroplea*; at any rate it should be removed from *Meloseira*, since the filaments are not siliceous.

Mr. Hassall has favoured me with the following observations on this plant:—"I can scarcely believe that *Meloseira Thompsoni* is really a *Meloseira*, for it does not appear to exhibit even one of the characters of that genus. The filaments in *M. Thompsoni* are equal, while in the species with which I am acquainted of true

* This similarity has also been observed by Mr. Berkeley.

Meloseira they are attenuated; the cells too are not divided as in *Meloseira* by lines, either single or double.

"The above I think are some of the principal differences between the *Conferva* which has received Mr. Thompson's name and the *Meloseira*, and these are in my opinion too considerable to admit of its holding a place with these. Would it not be more correct to place it with the species of the genus *Lyngbya*?"

* *Filaments moniliform; frustules united in pairs.*

1. *M. nummuloides*, Ag. Frustules spherical, having a line near each end, but less strongly marked than the central one. Ag. Syst. p. 8; Consp. Diatom. p. 65; Kütz. in Linnæa 1833, p. 70. fig. 72; Grev. in Hook. Br. Fl. vol. ii. p. 401; Harv. Br. Alg. p. 195. *M. discigera*, Ag. Syst. p. 8; Berk. Br. Alg. p. 31. t. 11. fig. 2! *M. Borreri*, Wyatt, Alg. Damn. no. 232! *Conf. nummuloides*, Dill. p. 45. t. B. *Conf. moniliformis*, Jurg. Dec. 1. no. 7! *Gallionella nummuloides*, Eh. Die Infus. p. 167. t. 21. fig. 1; Pritch. Infus. p. 199. *G. moniliformis*, Bailey, American Bacil. part 2. p. 4. pl. 11. fig. 3.

In the sea or in brackish water. Margate, *Rev. M. J. Berkeley*; river Dart, *Mrs. Wyatt*; salt marshes near Larne, co. Antrim, and near Dublin, *Mr. D. Moore*. Penzance; Bangor, N. Wales.

It is brown when recent and becomes green in drying. Filaments free, slender, moniliform, constricted between each pair of the frustules. Frustules globular, united in pairs, and each divided into hemispheres by a central line, and crossed by a fainter line at each end.

PLATE IX. fig. 1. *Meloseira nummuloides*; *a*, frustules deprived of colouring matter; *b*, different stages, showing the mode of growth; *c*, dotted lines, marking new hemispheres; *d*, new hemispheres just formed.

2. *M. Borreri*, Grev. Frustules rather longer than broad, cylindrical, rounded at the ends, with a central, strongly marked line. Grev. in Hook. Br. Fl. vol. ii. p. 401; Harv. Br. Alg. p. 196. *Conf. nummuloides*, Eng. Bot. t. 2287! (bad).

On marine algæ. Shoreham Harbour, *Mr. Borrer*; Chichester Creek, *Mr. Jenner*. Penmaen Pool near Dolgelly.

This species much resembles the preceding, but is I believe distinct. The filaments are stouter; the frustules rather longer than broad, cylindrical, with their ends less convex, and marked only with a central line. Sometimes the ends at their junction are compressed, and then the frustules appear angular. In this character it seems to approach the *M. moniliformis*; the ends however of the frustules in that species are figured by Ehrenberg as truncated cones—more convex therefore than those of *M. nummuloides*, and consequently still more so than those of this plant.

PLATE IX. fig. 2. *Meloseira Borreri*.

3. *M. globifera*, Harv. Frustules nearly globular, with numerous

striae, which are most evident on the siliceous covering. Harv. Br. Alg. p. 196. *Rosaria globifera*, Carm. in Hook. Br. Fl. vol. ii. p. 372.

On marine algæ. 'Torquay, Mrs. Griffiths; Hastings, Mr. Jenner; Ardmore, Miss Ball (according to a specimen from Mr. W. Thompson). Ilfracombe.

Filaments affixed by a short stipes; frustules nearly globular, united in pairs, each with a strongly marked central line. Numerous close striae pass round the filaments, and are most conspicuous on the siliceous remains of the old frustule, by which the new ones are connected in pairs.

The specimens which I have seen are apparently defective, as in all only one pair of frustules is attached to the stipes.

Ehrenberg represents the frustules of his *Gallionella lineata* as longer than broad, cylindrical, with a quadrangular appearance, whereas in this species they are nearly globular; otherwise I might have supposed he intended to describe this species.

Some specimens I have received from Mr. Jenner have their frustules generally longer than broad, but in other respects agree with the above description.

I have received from M. Montagne a *Meloseira* (*M. hormoidea*, Montag.) gathered in Cayenne, which appears to me to be identical with this species, and Mr. Berkeley is of the same opinion. As however the filaments are composed of several frustules, it is in a more perfect state than any British specimen which I have examined.

PLATE IX. fig. 3. *Meloseira globifera*.

**** Filaments not moniliform; frustules cylindrical.**

4. *M. arenaria*, Moore MS. Filaments stout; frustules broader than long, with a single central line; junction-surfaces closely united, striated. *Gallionella varians*, Eh. Die Infus. p. 167. (in part) t. 21. fig. 2; Pritch. Infus. p. 199. fig. 131° (junction-surface).

In fresh water. On a wet bank near Larne, co. Antrim, Mr. D. Moore; inner extremity of the Giant's Causeway, Mr. W. Thompson; very sparingly in a freshwater stream near Shoreham, Kent, Mr. Jenner.

Brownish when recent, pale green when dried.

Filaments much stouter than any other species in this genus, distinct to the naked eye, when rubbed between the fingers feeling rough like grains of sand, whence its specific name.

Frustules closely united, broader than long, discoid, appearing slightly granulated with a broadish smooth central line; their junction appears like a dentated suture; the junction-surfaces are striated in a radiating manner; the striae are most evident at the margin, and sometimes very faintly marked in the centre.

In drawing up the above description I have availed myself of Mr. Moore's notes.

Ehrenberg appears to have confounded this very beautiful and distinct species with *Meloseira varians*, which I am the more surprised at, because he has given very good figures of both plants.

The characters by which this species is distinguished from *Meloseira varians* have been so clearly pointed out by Mr. Dalrymple, that I shall use an extract from his letter instead of making any observations of my own.

"*Meloseira varians*, Ag., is as clearly *Gallionella varians* of Ehrenberg, t. 10. fig. 4, as *Meloseira arenaria*, Moore, is *Gall. varians* of t. 21. fig. 2. Still no tyro in natural history could presume that the two were the same species. The characteristic difference exists in the well-marked feature of the striæ at the junction-lines of the corpuseles, and which, combined with their discoid form, bears a strong resemblance to the milled heads of many of the adjusting screws of our microscope. Added to this is the appearance of radiating lines seen when the flat surface of the disc is viewed."

PLATE IX. fig. 4. *Meloseira arenaria*.

5. *M. varians*, Ag. Frustules once and a half to twice as long as broad, with a single central line, the ends slightly rounded; junction-surfaces without striæ. Ag. Consp. Diatom. p. 64!; Kutz. in Linnæa 1833, p. 71. fig. 69; Harv. Br. Alg. p. 195! *M. lineata*, Ag. Syst. p. 8; Harv. Br. Alg. p. 195! *Gallionella varians*, Eh. Die Infus. t. 10. fig. 4. *G. aurichalcea*, Bailey, Amer. Bacil. part 2. pl. 2. fig. 4 c. *Conf. lineata*, Dill. p. 44. t. B; Jurg. Dec. 5. no. 10! *Conf. hyemalis*, Jurg. Dec. 17. no. 6! *Vesiculifera composita*, Hassall in Annals of Nat. Hist. vol. x. p. 394!

In freshwater rivulets and ditches. King's Cliff, Northamptonshire, Rev. M. J. Berkeley; frequent in Sussex, Mr. Borrer; Lewes, Mr. Jenner; Cheshunt, Mr. Hassall; Shrewsbury, Mr. Leighton; Oswestry, Rev. T. Salwey.—Aberdeen, Dr. Dickie; Stevenston, Ayrshire, Rev. D. Landsborough.—Antrim and Limerick, Mr. W. H. Harvey; Ballycastle and near Belfast, Mr. D. Moore. Tavistock, Ilfracombe, Penzance, Dolgelley, Caernarvon.

It is brownish when recent and becomes green in drying*.

Filaments very slender, but varying much in thickness, fragile; joints from once and a half to twice as long as broad, with a single central stria, the ends rounded so that the joints are not so closely united as in *M. arenaria* and *M. orichalcea*.

• In a stream below Penmaen Pool near Dolgelley, and within the influence of the tides, I have gathered a tufted state of this species of a bluish colour, not unlike the iridescent tints of *Cystoseira ericoides*. It was growing with *Ectocarpus littoralis*. I have also for several years observed it in the same state in a cave by the sea-side at Penzance: in both instances it afterwards became brownish and finally green.

Not unfrequently this species has the joints here and there dilated into a globular form as described by Kützing; in this state it much resembles a species of *Vesiculifera*, Hassall; and indeed Mr. Hassall, whose researches have so much extended our knowledge of the freshwater Algæ, was induced by this resemblance to refer it to a subdivision of that genus, in one of his valuable and interesting papers on the British freshwater Conserve; but since his paper was published he has agreed with me in opinion that his *V. composita* is undoubtedly the *Meloseira varians* of Agardh, and not a species of *Vesiculifera*. When the joints are thus dilated, the central furrow gives the appearance of two joints combining in the formation of the inflated cells.

PLATE IX. fig. 5. *Meloseira varians*.

6. *M. orichalcea*, Kütz. Filaments slender; frustules two to three times longer than broad, marked with two central lines; junction-surfaces striated, closely united. Kütz. in Linnæa 1833, p. 71. fig. 68. *Gallionella aurichalcea*, Eh. Die Infus. p. 168. t. 10. fig. 6; Pritch. Infus. p. 200; Bailey, Amer. Bacil. part 2. p. 5. pl. 2. fig. 4 b.

In freshwater ditches and slow streams. Cheshunt, Mr. Hassall; Stevenston, Ayrshire, Rev. D. Landsborough; Dolgelley.

Brownish when recent; it becomes paler in drying.

The filaments are finer than in *M. varians*; joints two to three times longer than broad, with two lines near the centre; ends closely united in the same manner as in *M. arenaria*, but the den- tated appearance of the ends of the striae is less evident; junction-surfaces flat with radiated striae, which are often very obscure in the centre, but generally plainly developed round the margin.

This species is likely to be mistaken for *M. varians*; but its filaments are more slender and more uniform in size, the joints are longer, more closely united, and especially it differs in having two central lines and striated junction-surfaces, and in not turning green in drying.

Kützing figures this species with joints occasionally enlarged in the same manner as in *M. varians*.

Mr. Hassall first detected it in this country.

PLATE IX. fig. 6. *Meloseira orichalcea*.

*** Filaments very slender; joints obscure.

7. *M. ochracea*. Frustules very slender, convex at each end, ovate, not striated, ferruginous; filaments often connected together in a subramose manner. *Gallionella ferruginea*, Eh. Die Infus. p. 169. t. 10. fig. 8. and t. 21. fig. 3; Pritch. Infus. p. 200. figs. 129, 130. *Conserva ochracea*, Dill. t. 62! *Oscillatoria ochracea*, Grev. Fl. Edin. p. 304; Harv. Br. Alg. p. 167.

Pools and slow running streams, especially in boggy soils.

This plant occurs in delicate ochraceous or ferruginous masses, falling into powder on the slightest touch. The filaments are so slender, and the joints so obscure, that I have been unable to determine the form of the frustules, and have therefore taken the specific character from Ehrenberg; I am also unable to ascertain whether the joints are marked by any central line. Having received from Mr. Dillwyn a specimen of his *Conferva ochracea*, which I am able confidently to refer to this species, I have restored the original specific name. Ehrenberg is no doubt correct in placing the plant in this genus, as the filaments are siliceous and cylindrical.

When submitted to a red heat it acquires a reddish tinge, which circumstance, together with the colour and slender filaments, will easily distinguish it from all the other species.

Analysis.

1. { Joints very obscure, the central line apparently wanting, <i>ochracea</i> .	
1. { Joints and central line distinct	2
2. { Filaments moniliform; frustules connected in pairs.....	3
2. { Filaments not moniliform; frustules not connected in pairs.....	5
3. { Frustules and connecting portion closely striated	<i>globifera</i> .
3. { Frustules with one to three lines, not striated	4
4. { Frustules globular	<i>nummuloides</i> .
4. { Frustules longer than broad, cylindrical, with the ends rounded	<i>Borreri</i> .
5. { Junction-surfaces not striated	<i>varians</i> .
5. { Junction-surfaces striated	6
6. { Frustules broader than long	<i>arenaria</i> .
6. { Frustules two or three times longer than broad	<i>orichalcea</i> .

XLV.—*Information respecting Scientific Travellers.*

WE take much pleasure in announcing that three enterprising botanists are now engaged in exploring the most interesting portions of the *far West*, and that their collections of dried plants will be offered to subscribers, in sets, as they come to hand. Two of these collectors, Mr. Charles A. Geyer (well known as the botanist of Mr. Nicolle's official north-western expedition), and Mr. Lüders, who are for the present attached to Sir Wm. Stewart's party, have by this time reached the Rocky Mountains. The particular field of Mr. Geyer's operations, and the extent of his journey, were undecided at the time of his departure from St. Louis. Mr. Lüders expects to spend the next winter, and perhaps the ensuing summer, at a station of some Roman Catholic missionaries on the upper waters of Lewis and Clarke's or Great Snake River. These botanists being well acquainted with the vegetation of the general Valley of the Mississippi and of the lower Missouri, will doubtless avoid the common and better known plants of this region; and thus their collections may be expected to prove unusually choice and valuable.