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On some UNDESCRIBED SPECIES of DIATOMACEÆ.

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(Communicated by F. C. S. Roper, F.L.S., F.G.S., &c.)

IN purposing to give, in this and future short papers, figures and descriptions of new forms of Diatomaceæ from my cabinet, I trust that no apology is needed, but rather, by so doing, to be of service to diatomists.

As a general rule, it may not be deemed advisable to describe a new form from scanty materials, or from single specimens; but when a form occurs that cannot easily be confounded with any described species, the sooner it is made known the better, in order that others may have their attention drawn to it.

I gladly make use of this opportunity to call the attention of those who have facilities for obtaining from their correspondents in Australia, the Pacific Islands, West Indies, &c., the alimentary matter of Ascidiæ and other molluscs. It will be seen that some of the forms described in this paper are from an Ascidian gathering from the west coast of Australia.

For this gathering I am indebted to the kindness of Dr. J. D. Macdonald, of H.M. Surveying Ship Herald. The great bulk of non-diatomaceous matter in this gathering being calcareous, it was readily cleaned by means of acid; and turned out to be by far the richest in new and undescribed forms of any gathering I have had an opportunity of examining.

Among the beautiful forms, are such as *Navicula bullata*, *Campylodiscus diplostictus*, &c.; there are a great many which I am unable to refer to any existing genera.

The stomach-contents of the larger Mollusca, such as *Strombus* and *Tridacna*, would, doubtless, be found to be mainly diatomaceous in their nature.

Even land molluscs seem to derive part of their nutrition from the endochrome contained between the siliceous valves of Diatomaceæ, for on recently examining the fæcal matter of our common garden-snail, *Helix aspersa*, I noticed, among other forms, a good many valves of *Nitzschia Amphioxys*, a species which Ehrenberg has found in a great number of samples of soil from various parts of the world, and which seems to have a wider geographical range than any other species that I am acquainted with.

Again, the tadpole of the common Frog seems to be

almost exclusively diatomivorous in the selection of its food. I lately examined the stomach-contents of some specimens which had been kept for a few weeks in a small glass tank, when the mass was found to consist of fully sixty per cent. of *Diatomaceæ*.

These circumstances are mentioned here merely for the purpose of attracting the attention of those who have the opportunity of studying the subject more fully. It is also quite possible that such investigations may tend to clear up the yet, I believe, disputed point, as to the vegetable or animal nature of these beautiful organisms.

1. *Astrolampra Stella*, n. sp., Norm. (Plate II, fig. 1).—Valve of six rays, rays club-formed in the centre and gradually becoming linear towards the margin. Outer edge of disc divided into twelve punctate divisions.

Habitat.—Sierra Leone, in a gathering kindly communicated by Mr. F. Kitton, of Norwich.

This remarkable disc, I place, provisionally, in *Astrolampra*, its structure having little in common with that genus. The unsymmetrical appearance may be, and in all probability, is owing to my specimen being a double valve, for in the centre is seen a series of six indistinct rays, which I have endeavoured to give in the drawing.

Altogether it is a remarkable form, and, probably, ought to constitute a new genus.

By giving it a place in this paper, I hope to call the attention of those who have correspondents at Sierra Leone, to urge them to send material from the coast in that locality.

2. *Surirella Baldjiki*, n. sp., Norm. (Fig. 2).—Valve panduriform, canaliculi conspicuous, widening out towards the margin, absent in constricted portion. Centre of valve a smooth cruciform space; the transverse limb being broader than the longitudinal one, and approaching the margin of the valve at its constricted part. Margin of valve striated; striæ 40 in '001'.

Marine, in a deposit from Baldjik, near Varna.

This deposit is full of beautiful and interesting forms, many of which are new and undescribed. The piece of earthy deposit I picked out of a cargo of bones discharging in the docks. The captain of the vessel informed me that the cliffs about Baldjik are wholly composed of this white-coloured earth.

It will be worth while obtaining a larger supply of this material, which is the same that yielded the beautiful little form which Mr. Brightwell has described as *Odontidium Baldjiki*.

3. *Coscinodiscus fuscus*, n. sp., Norm. (Fig. 3).—Valve convex, depressed in centre; granules arranged in radiating lines, diminishing in number at intervals, thus forming distinct zones. Granules 20 in '001'; diameter of valve '0043' to '0067'.

Marine, stomach of Ascidiæ, North Sea.

Valve, under a low power, opaque, brownish black, lighter in centre, where it is green. At first sight it reminds one of *Eupodiscus Ralfsii*; but the colour is much darker, the granules much smaller, and more crowded together. In this respect it appears to be half way between *E. Ralfsii* and a disc which I found in considerable quantities on bones from Constantinople, and which has been doubtfully referred to *Eupodiscus subtilis*.

The want of anything like a marginal nodule in the species now described, relieves me of any uncertainty as to its proper generic position; hence I refer it, without hesitation, to *Coscinodiscus*. Hitherto it has occurred only in one or two ascidian gatherings, and then only sparsely.

4. *Nitzschia vitrea*, n. sp., Norm. (Fig. 4).—Frustule hyaline, broadly-linear, extremities truncated; valve linear-lanceolate, slightly constricted in centre, and somewhat produced at the ends; puncta conspicuous, bead-like. Striæ very obscure, 58 in '001'. Length of frustule '0025' to '0055'.

In brackish water, Hull.

It is not often that one has the good fortune to detect a new British form. The present one, however, cannot be referred to any of the species given in Smith's 'Synopsis.'

The only locality that has hitherto yielded it is a small ditch of water influenced by high spring tides. The same locality furnishes *Nitzschia Brébissonii*, *vivax*, and *bilobata*.

5. *Aulacodiscus Sollittianus*, n. sp., Norm. (Fig. 6).—Disc large, colourless, processes very prominent (about six), submarginal. Granules in radiating lines, 9 in '001', absent in centre valve and around base of processes.

In a deposit from Nottingham, Maryland.

Diameter of valve '009'; processes large, and, under a low power, appearing as if they had rings attached to them.

This fine species I have great pleasure in dedicating to Mr. J. D. Sollitt, whose long services with the microscope, conjointly with Mr. Robert Harrison, have, I think, been insufficiently recognised.

Unfortunately it is very scarce in the small quantity of the deposit I have hitherto worked upon. I expect soon to have a

large quantity of the material, when it is to be hoped that it may prove more abundant. The blank centre, large size, and unusual distance from the margin of the nodules, together with the large blank spaces around the same, render this a well-marked species.

Judging from the occurrence, in abundance, of the various species of *Heliopelta* in this deposit, together with *Eupodiscus Rogersii*, *Craspedodiscus elegans*, *Aulacodiscus Cruz*, *Sceptro-neis caduceus*, *Triceratium solenoceros*, *condecorum*, *undulatum*, and *acutum*, there can be little doubt that it is identical with the Bermuda earth of Professor Bailey, the locality of which has hitherto remained in much doubt. For the small quantity received I am indebted to Messrs. Sullivant and Wormley, of Columbus, Ohio. The deposit was discovered, I believe, by Dr. Johnson, of Baltimore, near Nottingham, in Maryland, not far from the Patuxent River, and within a moderate distance of Piscataway, where the well-known rich deposit occurs.

Bermuda Hundred, on the James River, in Virginia, is distant about a hundred miles from Nottingham, but as all the waters of this district find their way into the great Chesapeake Bay, it is quite possible that the locality suggested by Dr. Arnott may have furnished the sample of Bermuda earth originally sent to this country by Dr. Bailey. I understand, however, from Messrs. Sullivant and Wormley, that Dr. Johnson had examined the country at Bermuda Hundred without finding any deposit whatever. When the larger supply of the Nottingham material arrives, I shall be glad to supply my friends with a portion.

6. *Eupodiscus ovalis*, n. sp., Norm. (Fig. 7).—Valve elliptical, nodule single, submarginal; granules arranged in radiating lines, crowded near the margin, sparser towards the centre. Colour, tawny brown. Length of valve $\cdot 0020''$ to $\cdot 0035''$.

Marine, stomach of Ascidians, Shark Bay, Australia.

This species approaches *Eupodiscus fulvus*, differing, however, in the elliptical shape, altered position of the nodule, which in the latter is nearer the margin, and also in the arrangement of the granules, the disc being divided into regular segments by the longest lines of granules.

7. *Navicula bullata*, n. sp., Norm. (Fig. 6).—Valve elliptical, extremities slightly produced. Striæ in a marginal and two central bands; marginal bands of unequal width. The smooth space between the striated bands studded with a line of circular bosses. Striæ moniliform, 14 in $\cdot 001''$. Length of valve $\cdot 0065''$; breadth $\cdot 0030''$.

Hab.—Stomach of Ascidians, Shark Bay, western coast of Australia; kindly communicated by Dr. Macdonald.

This singularly beautiful form is exceedingly rare in the above-mentioned gathering. It belongs unquestionably to the group of forms of which *Nav. lyra* is the type. The remarkable row of bosses on the smooth bands renders it distinct from any known species.

It may be remarked that, in describing the structure of *Coscinodiscus fuscus* and *Aulacodiscus Sollittianus*, I have designated the markings on the valves "granules," instead of adopting the usual method of calling them areolæ, or cells. Hitherto, I believe, most authors have adopted the latter designation in describing the various species of *Coscinodiscus*, *Aulacodiscus*, *Eupodiscus*, &c., and have, by so doing, in my opinion, overlooked the real nature of the construction.

Dr. Wallich has done good service in pointing out the true structure of the markings of *Pleurosigma*, and I feel convinced that all the above-mentioned discs are constructed on the same plan, differing only in the form of the elevations or granules, and their arrangement on the surface of the valve.

In *Pleurosigma* the markings are four-sided elevations; while in *Coscinodiscus*, *Eupodiscus*, &c., they are circular when not crowded, but assuming the irregular or hexagonal form when pressing on each other. The same structure appears to exist in *Biddulphia*, *Isthmia*, &c., and probably in all diatoms, not even excepting *Triceratium favus*, the raised portions of silex only differing in form.

On examining a valve of *Coscinodiscus gigas*, or *lineatus*, for instance, with a good one fourth or one twelfth, we find the colour of the valve, in the interstices between the granules, to be pink, whereas the granules themselves are white, or colourless.

The true structure, however, is better seen in valves where the granules are more circular, and not so much crowded together. Here the structure will be apparent at a glance.

DESCRIPTION OF PLATE II,

Illustrating Mr. G. Norman's paper on some Undescribed
Species of Diatomaceæ.

Fig.

1.—*Asterolampra Stella*.

2.—*Surirella Baldjiki*.

3.—*Coscinodiscus fuscus*.

4.—*Nitzschia vitrea*.

5.—*Aulacodiscus Sollittianus*.

6.—*Eupodiscus ovalis*.

7.—*Navicula bullata*.

All magnified 400 diameters.

Fig. 3.

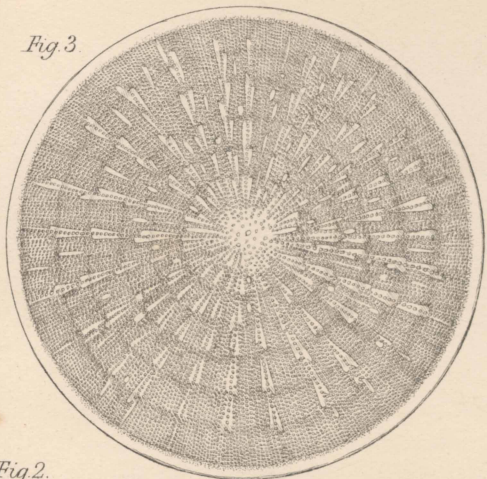


Fig. 6.

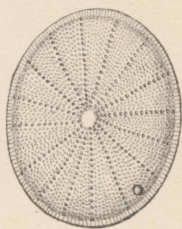


Fig. 2.

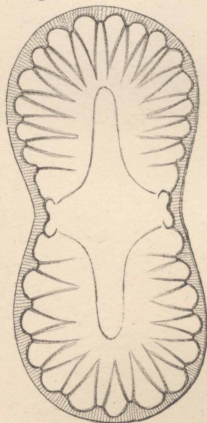


Fig. 1.

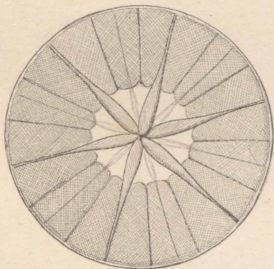


Fig. 7.

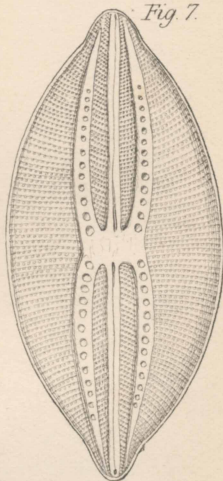


Fig. 5.

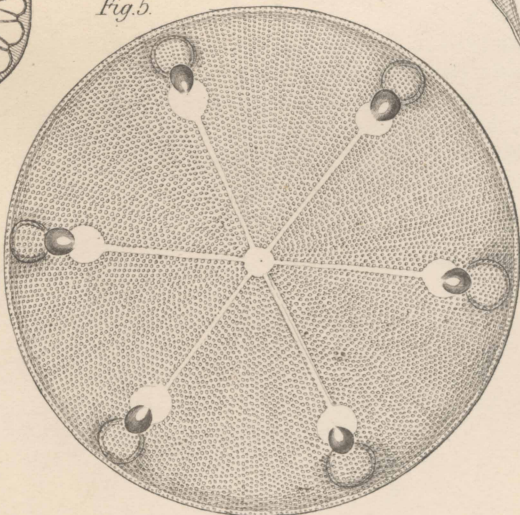


Fig. 4.

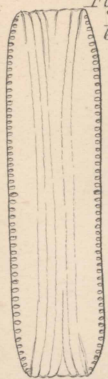


Fig. 4.

