Account of some new infusorial forms discovered in the fossil infusoria from Petersburg, Va., and Piscataway, Md. / by J.W. Bailey.

ACCOUNT

OF SOME

NEW INFUSORIAL FORMS

DISCOVERED IN THE

FOSSIL INFUSORIA

FROM

PETERSBURG, VA., AND PISCATAWAY, MD.

BY PROF. J. W. BAILEY.

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FOSSIL INFUSORIA.

THE results of a hasty examination of specimens of fossil infusoria from Petersburg, Virginia, were given by me at the meeting of the Association of American Geologists and Naturalists in Albany, but more careful observations have led to the discovery of several new and interesting forms, and have made me better acquainted with the nature of others which had then been seen only in the fragmentary state. Many of these forms are, I believe, entirely unknown to naturalists, and as additional interest has been given to them, by the fact that several of them occur at the new locality just discovered by Prof. W. B. Rogers at Piscataway, Maryland, as well as at Petersburg, Virginia, I am induced to publish the following account, accompanied by sketches, which although they purport to be mere outlines, will yet serve to give a tolerably correct idea of these very curious and anomalous bodies. Among the most interesting of these bodies are the following.

1. *Podiscus Rogersi*, nob. (figs. 1 and 2, Plate III.) This is the most beautiful fossil animalcule which has ever been discovered. It undoubtedly belongs to the same genus as the curious living forms discovered by Ehrenberg in sea water, and very naturally named by him *Tripodiscus Germanicus*, as his specimens had but three foot-like projections. But as our species shows that *the number of feet may vary from three to seven*, I have ventured to change the generic name to *Podiscus*, and I trust that Ehrenberg will be willing to adopt so slight a modification of the name of this genus, the honor of the discovery of which belongs to him alone. As our species is the largest and most beautiful of the fossil infusoria occurring in the infusorial strata, of which Professor William B. Rogers of the University of Virginia made the truly splendid discovery, I have selected it as peculiarly appropriate to bear the name Podiscus *Rogersi*. The characters of this genus, as given by Ehrenberg, are as follows: "It

belongs to the Bacillaria, section Naviculaceæ. Its members are free and possess a round bivalved siliceous lorica, having three [or more] appendiculated processes, and dividing by longitudinal self-division." He appears to have seen no fossil species, as he describes none but the *P. Germanicus*, which he found alive in sea water at Cuxhaven. Our species may be thus characterized:

Podiscus Rogersi, (figs. 1 and 2.) *Lorica large, orbicular and compressed, having three to seven hyaline lateral processes placed on an elevated circle, within which the disc is slightly concave, and outside of which the surface is part of the frustum of a cone.* The whole surface is beautifully punctate, in a manner to which no engraving could do justice. The most complicated markings on the Coscinodisci scarcely rival the elaborate ornaments of this truly elegant creature. This species is quite common in the fossil state at Petersburg, Va. and also occurs at Piscataway, Md. Our figure is intended merely to show the general size, and the position of the feet. Fig. 1 shows a view of the disc, and fig. 2 is half of an individual seen edgewise.

2. *Zygoceros Tuomeyi*, nob. (figs. 3 to 9.) The remarkable form represented in outline by these figures, occurs both at Petersburg and at Piscataway. I am disposed to refer it to Ehrenberg's genus Zygoceros, which he describes as being "free, Navicula shaped, compressed and bivalved, each end provided with two perforated horns." The figures above referred to will give a better idea of the shape of our species than words will furnish, but the following is offered as an attempt to characterize it.

Zygoceros Tuomeyi. *Lorica having at each end two obtuse horns, with swollen bases, between which are one to three globular projections on each side; those in the middle being largest, and often bearing two spines.* At the base of each of the swellings the shell often shows perforations, (see *a*, *a*, *a*, figs. 3 and 4,) and the whole surface of the shell is covered with shagreen-like asperities. I dedicate this species to M. Tuomey, Esq., to whom I am indebted for fine specimens of infusorial and other fossils from the neighborhood of Petersburg. Fig. 3 shows a large and perfect individual; fig. 4, a smaller one; fig. 5, a young individual; fig. 6, one seen obliquely; fig. 7, an oblique view of one half; fig. 8, a top view; and fig. 9 shows two halves of different individuals united in the manner in which they probably formed chains when living.

3. *Zygoceros rhombus?* (figs. 10 and 11.) Our figure represents a species which so closely resembles the *Z. rhombus* of Ehrenberg, that I am inclined to consider it as most closely allied to, if indeed it be not a variety of, that species. Ehrenberg thus describes *Z. rhombus:* "Large, lorica turgid, viewed laterally rhomboidal and having rounded angles, surface marked with very delicate striæ, the back having a smooth central zone." These characters apply pretty well to our species, with the exception that the central zone in ours is quite distinctly striated, with two sets of lines crossing each other at right angles. The shape of the horns is also somewhat different in our species from those shown in Ehrenberg's figure. The *Z. rhombus* was discovered by Ehrenberg alive in sea water at Cuxhaven; our species is very abundant in the *fossil* state at Petersburg, Va.

To the genus Zygoceros I now unhesitatingly refer the living species which I detected in Boston harbor, and which I described by the name of *Emersonia elegans.* I propose therefore to change this name to that of *Zygoceros Emersoni.* My *Emersonia antiqua* (fig. 25, Pl. II, of Bacillaria) is probably only the young state of *Z. rhombus?* abovementioned. The living species form zigzag chains.

4. *Triceratium spinosum*, nob. (fig. 12.) This large and very curious species of Triceratium occurs sparingly at Petersburg, Va. Its lorica is triquetrous, laterally slightly convex, with obtuse angles or horns, the surface marked with shagreen-like projections, and bearing four [or more?] large spines. Fossil with several other species of Triceratium at Petersburg. The figure shows the outline of half of an individual.

5. *Navicula? concentrica*, nob. I give this provisional name to the bodies represented in figures 13, 14 and 15. When seen laterally they show an elliptical figure, marked with concentric circular spaces, which when seen edgewise are found to bound a series of gradually diminishing step-like projections. Two individuals [?] probably resulting from spontaneous division, are usually found adhering. Fossil at Petersburg and Piscataway. Fig. 13 shows an edge view, fig. 14 the side, and fig. 15 an oblique view, with the end to the front.

6. *Dictyocha fibula?* (fig. 16.) This occurs in *vast* abundance among the fossil infusoria at Piscataway, Md. It differs from Ehrenberg's *D. fibula*, by generally having five instead of

four cells in the convex rhomboid, but I am satisfied that the number of cells is a very variable character in this genus.

7. *Dictyocha aculeata?* (fig. 17.) Our figure represents a fossil species of Dictyocha from Piscataway, which perhaps belongs to Ehrenberg's species *D. aculeata*, for which he gives the following characters. "Cells arranged by sixes in the form of a ring, each cell being spiny within."

In figures 18, 19 and 20, are shown several other fossil species of Dictyocha from Petersburg and Piscataway; some of them are probably new.

In figure 21 is represented a fragment of a singular body, which was rounded or pyriform, with large perforations in its surface. Several fragments of similar bodies were found among the infusoria from Piscataway; and in Plate III, figs. 27 and 28, of my memoir on the Bacillaria, I have represented analogous bodies from Richmond. Their nature is unknown to me.

In figure 22 are shown small globular bodies, with projecting spines, which occur fossil at Piscataway. They resemble somewhat the curious siliceous spiculæ discovered by Bowerbank in the *Tethea lyncurium*.

Figures 23 and 23 *b*. show two other singular shaped spiculæ from Piscataway.

Figures 24 to 27 show anomalous bodies occurring fossil at Petersburg and Piscataway. They consist of an elliptical base, supporting one or two conical bodies which terminate in simple or branched projections.

Figure 28 appears to be half of a body allied to Coscinodiscus, but with radiating striæ instead of cells upon its surface. Fossil at Piscataway.

Figures 29, 30 and 31, represent hollow glass-like siliceous spines, not uncommon at Piscataway, but of whose nature I am ignorant.

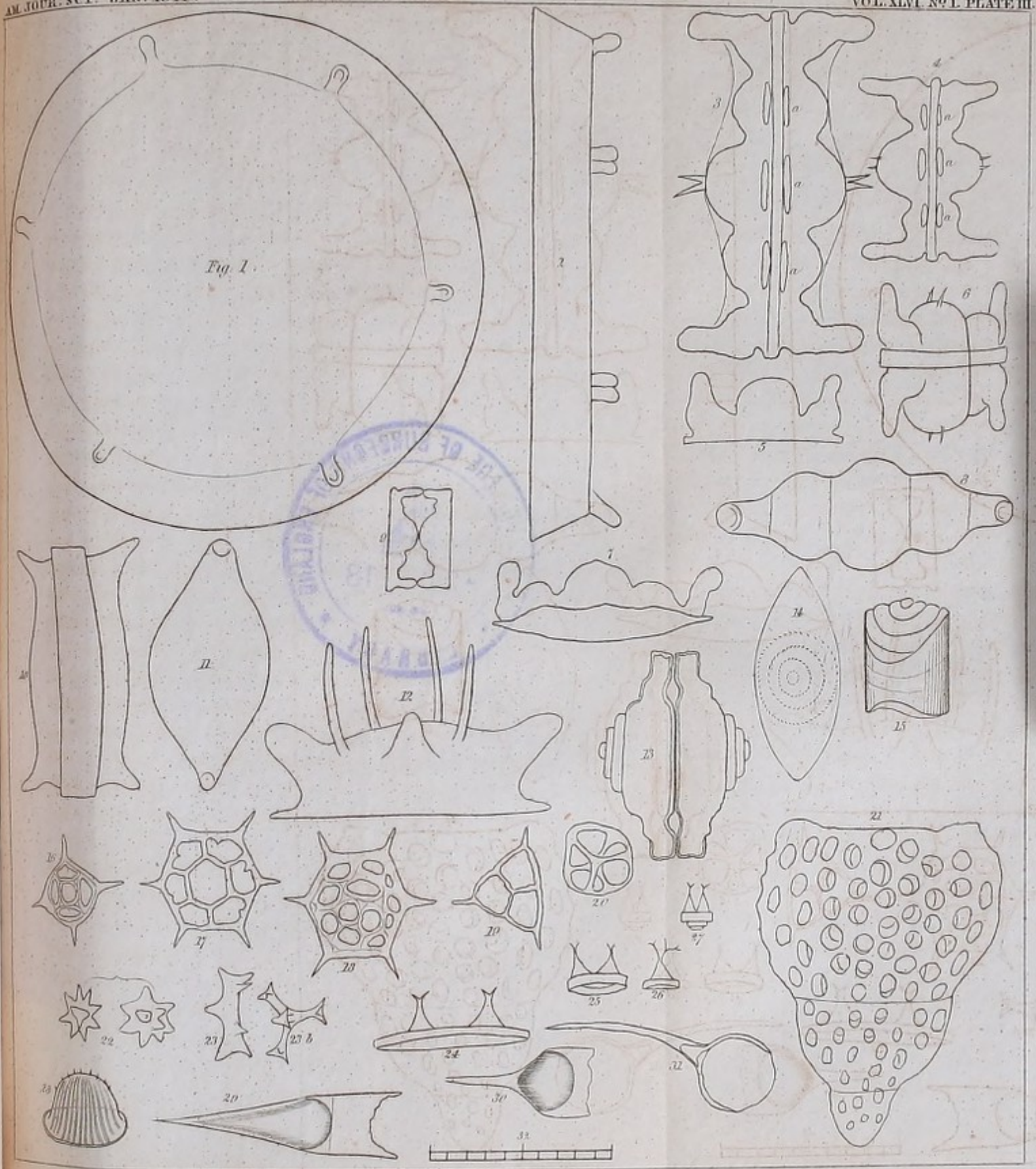
None of our infusorial marls that I have yet examined contain any Polythalamia, but in the accompanying tertiary beds of shells, I have found numerous and highly interesting Polythalamian forms, which I propose to describe in a paper which I am preparing upon the American fossil Polythalamia. All the figures which accompany this paper were traced from nature by the aid of a camera lucida eye-piece, and are therefore correct as far as they go, but all the minute markings are omitted. The

scale to which they are all drawn is shown in fig. 32, which represents $\frac{1}{1000}$ths of a millimetre, magnified equally with the drawings.

West Point, Oct. 31, 1843.

Note.—I take an opportunity afforded while correcting the proof-sheet of the preceding article, to state that since it was written I have examined some sediment which I collected from a small creek, opening into the Atlantic ocean near Rockaway Pavilion, Long Island, and that among many interesting infusorial forms I had the pleasure of finding *recent* specimens of *Podiscus Rogersi*, having *four* foot-like processes. I also found that rare and beautiful form, *Biddulphia pulchella*, and was struck with its *generic* resemblance to the above-mentioned *Zygoceros Tuomeyi*. It is possible that the latter should be referred to the genus Biddulphia. Large and beautiful specimens of *Triceratium favus*, Ehr. occurred with the above, and I noticed also *Dictyocha fibula* and *D. speculum*, besides numerous species of Coscinodiscus and Actinocyclus. Small Polythalamia belonging to the genus Rotalia occurred with the above, thus giving upon our *sandy* sea-coast a mixture of infusorial and Polythalamian forms analogous to that which Ehrenberg has observed in some of the chalk marls of Europe and Africa. In examining mud from Boston harbor, I have recently detected portions of that truly beautiful infusorial form, *Isthmia obliquata*. For full descriptions of it, and of the above-mentioned *Biddulphia pulchella*, see a paper on British Diatomaceæ, by John Ralfs, Esq., in the Annals and Magazine of Natural History, Vol. XII, p. 271. A translation of Ehrenberg's paper, describing some of the interesting forms detected by him living in sea water, will be found in Taylor's Scientific Memoirs, Vol. III, Parts X and XI, accompanied by figures of *Podiscus Germanicus*, *Zygoceros rhombus*, *Triceratium favus*, and several other forms above referred to. J. W. B.

West Point, Dec. 5, 1843.



BAILEY'S FOSSIL INFUSORIA.