

IV.—ON *ORTONIA*, A NEW GENUS OF FOSSIL TUBICULAR ANNELIDES,  
WITH NOTES ON THE GENUS *TENTACULITES*.

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HAVING recently had the opportunity of carefully investigating the genus *Tentaculites*, I was led to the conclusion that several fossils of diverse zoological affinities had been included under this head, and that the prevalent differences of opinion as to the systematic position of this genus might be thus readily explained (American Journ. of Science and Arts, vol. iii., no. 15, 1872). Originally founded by Schlotheim in 1820 (Petrefact. i., p. 377), *Tentaculites*, as its name implies, was believed to comprise fossils which were nothing more than the slender terminations of the jointed arms of Crinoids. Modern palæontologists have been divided in opinion as to whether *Tentaculites* was truly referable to the Tubicular Annelides or the oceanic group of the *Pteropoda*—most recent authorities placing the genus in the latter class. In point of fact the difficulty has really arisen from the circumstance that two dissimilar sets of fossils have actually been included under *Tentaculites*; some of these being genuine *Pteropods*, whilst others are equally genuine Tubicular Annelides. As all the *typical* species belong to the first group, it follows that the genus *Tentaculites* remains a *Pteropodous* one; whilst the Annelidan forms must be referred to new genera.

The restricted genus *Tentaculites*, then, may be defined as including small shells which have the form of *straight* conical tubes, tapering towards one extremity to a pointed closed apex, and expanding towards the other to a rounded aperture. The shell is *free*, and its walls are thin, and are surrounded by numerous thickened rings or annulations, sometimes with intermediate striæ, over the whole or part of the length of the tube.

The two points by which *Tentaculites* may be distinguished from all homomorphous forms are—firstly, that the shell is *straight*, or if bent, regularly bent or curved; and secondly, that the shell is *free*. It is quite clear that if, as there is every reason to believe, the genuine forms of *Tentaculites* are truly referable to the *Pteropoda*, every example must conform to these two characters. No member of the genus can possibly have been attached to any foreign body; and none can have been irregularly twisted or bent. The shell in all genera of *Pteropods* is *free*, and in all is either *straight* or is *regularly curved*.

On the other hand, whenever we meet with apparent examples of *Tentaculites* which are attached parasitically to shells or other foreign bodies, or which have the shell irregularly contorted, we may be quite sure that we cannot be dealing with any *Pteropod*. We are dealing now with Tubicular Annelides, and it is a matter of astonishment how close a superficial resemblance is presented between some of these and specimens of *Tentaculites* proper.

In accordance with the principles here laid down, I have already

proposed the genus *Conchicolites*, to include Tubicolar Annelides, the tubes of which are attached socially in clustered masses to dead shells. The tubes are composed of short imbricated rings, and are ranged side by side, being attached by their smaller ends only. The genus is, so far as known, confined to the Lower Silurian rocks; and broken fragments are almost, or quite, undistinguishable from *Tentaculites* (American Journ. Science and Arts, vol. iii., no. 15, 1872).

I have now to found another genus for the reception of an allied but very distinct Tubicolar Annelide, which has been previously referred with doubt to *Tentaculites*. This genus I propose to name *Ortonia*, after Mr. Edward Orton, of the Geological Survey of Ohio, who has kindly furnished me with specimens. Only a single species is known to me, from the Lower Silurian (Hudson River group) of South-Western Ohio, where it appears to be a common fossil. It has been doubtfully identified with Hall's *Tentaculites flexuosa* (Pal. New York, vol. i. p. 92); and if this determination could be relied upon, I would gladly retain the above specific name. Hall, however, describes his species as being furnished with distinct internal transverse septa; and this structure is certainly altogether wanting in our fossil. I shall, therefore, adopt for the present form the name of *Ortonia conica*, in allusion to the form of the investing tube.



FIG. 1.—A. Tubes of *Ortonia conica*, Nich., growing upon the valve of *Strophomena alternata*. Nat. Size. B. A single tube of the same, enlarged.

The genus *Ortonia* comprises small conical calcareous tubes, which are found attached to the outer surfaces of the shells of Brachiopods or other Molluscs. Mr. Orton informs me that in one locality, at Cincinnati, the species confines its parasitism entirely to *Strophomena alternata*; but elsewhere it attaches itself to other shells as well. The tubes are attached along the whole of one side, full-grown specimens being from four to sixth-tenths of an inch in length. In shape, the tubes are markedly conical (Fig. 1B), their section being circular, or at times somewhat trigonal. Almost all the tubes, though in the main straight, are more or less curved and bent towards their smaller closed extremities. The widest extremity of the tube

opens by a more or less nearly circular aperture; and the continuity of the tube, from its open to its closed extremity, is not interrupted by any internal septa. The surface-characters of the tubes are of a very remarkable character. Upon the surface, diametrically opposed to that along which the tube is attached to the shell, the tube is of a cellular character, exhibiting numerous rounded pits or *alveoli*, which strongly remind one of the peculiar cellular structure of the tube of *Cornulites*. This peculiar structure occupies a narrow belt running down the tube, along its dorsal or free surface; and from both sides of this belt there proceeds a series of strong annular ridges or rings which pass round the tube, to disappear on its fixed margin. These rings are not separated by secondary intermediate annulations; nor do they exhibit any longitudinal striation. Sections of the tubes, however, show that these rings are just as visible on the interior of the tube as they are externally.

No reasonable doubt can be maintained as to the zoological position of *Ortonia*. It is unquestionable that we have to deal here with a true Tubicolar Annelide, nearly allied to the recent *Serpula*. *Ortonia* is still more nearly related to the extinct genus *Cornulites*, from which it differs in its much smaller size, and in being attached along the whole of one side, instead of by its smaller extremity only. It differs, also, in having the peculiar cellular structure of the tube confined to a definite portion of its surface, and in being altogether destitute of longitudinal striation. From *Conchicolites*, again, *Ortonia* is distinguished by the much more complete mode of its attachment, and by the fact that the tubes are never attached socially in clustered masses, growing side by side, as is the case in the former genus.

The following diagnosis gives the characters of the genus *Ortonia* and of the single known species:—*ORTONIA*, Nich.—Animal solitary inhabiting a calcareous tube, which is attached along the whole of one side to some foreign body. Tube, slightly flexuous, conical, in section cylindrical, or somewhat flattened laterally, and sub-triangular. Walls of the tube thick, cellular along the surface opposite to the attached portion, markedly annulated along the sides.

*Ortonia conica*, Nich.—Tubes growing attached to the shell of some Mollusc; varying in length from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch, with a diameter of about  $\frac{1}{10}$  of an inch at the mouth. Lateral annulations of the tube varying in number from 30 to 35 in the space of an inch. Surface smooth and completely destitute, so far as observed, of longitudinal striæ.

The fossil from which the above description has been taken is an example of *Strophomena alternata*, to the dorsal valve of which are attached the remains of more than twenty individuals of *Ortonia conica*. In one case the tube of one crosses that of another individual; but it is quite clear that this is an accidental circumstance, so to speak, and that the tubes are truly solitary. The specimen is from the "Cincinnati group" of South-Western Ohio, a formation which belongs to the "Hudson River series," and which corresponds with the Caradoc or Bala division of the Lower Silurian.

In conclusion, I may add that Mr. Orton has submitted to me a beautiful specimen, apparently of the *Tentaculites tenuistriata* of Messrs. Meek and Worthen, also from the Cincinnati group of South-Western Ohio. If this specimen be rightly determined, I cannot avoid the conclusion that it is truly referable to the genus *Cornulites* of Schlotheim—differing from the familiar *Cornulites serpularius* in its small size, and in some other minor characters. This conclusion, however, does not admit of complete verification except by the discovery of specimens absolutely attached to some foreign body.

## V.—ACCOUNT OF AN EXPEDITION TO GREENLAND IN THE YEAR 1870.

By Prof. A. E. NORDENSKIÖLD,

Foreign Correspondent Geol. Soc. Lond., etc., etc., etc.

### Part IV.

(Continued from page 427.)

SOMEWHAT further to the west of Karsok, and about 50 feet higher up, occurs another similar stratum, containing a mass of graphite, so soft that it may be cut with a knife. This spot was not, however, accurately examined. A similar stratum of graphite imbedded in sand and clay occurs also at a very great height above the sea at Niakornet, but time did not admit of our visiting that spot.

The graphite from Karsok is perfectly compact, without any signs of cleavage. On being heated, some pieces decrepitate violently and yield water. An analysis by Dr. Nordström gave :

	I.	II.	III.
Carbon .....	93·70	95·68	95·42
Hydrogen ...	0·69	0·22	0·27
Ash .....	4·92	3·60	3·60
	99·31	99·50	99·29

Part of the loss was probably oxygen. The ash contained per-oxide of iron, alumina, and 50 per cent. of silica; so that even these analyses indicate that this mineral is much nearer pure graphite, with which it fully agrees in appearance, than the coal that is usually found in these formations.

In the strata belonging to this division we found plant-remains at the following places :—

1. *Ekkorfat*.—The strata here rest

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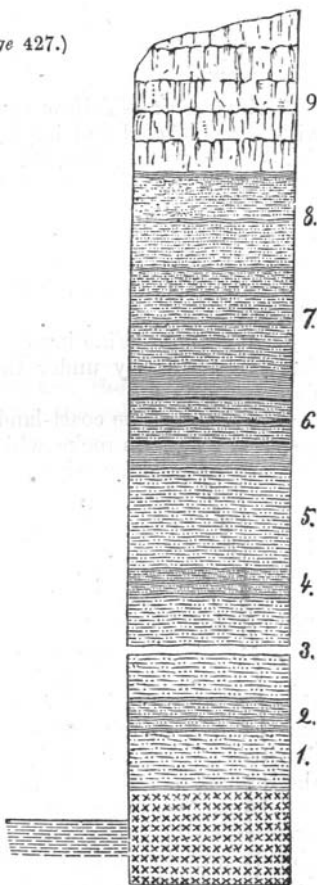


Fig. 9. Succession of strata at Ekkorfat.