

ART. XX.—*On the structure of Obolella chromatica*; by E. BILLINGS, F.G.S.

THE genus *Obolella* was founded in 1861,* on the following three species of Brachiopoda:

1. *O. chromatica*, discovered by J. Richardson in 1861, at a place called "L'Anse au Loup," on the north shore of the Straits of Belle Isle, in Labrador.

2. *O. crassa* Hall, from Troy, in the State of New York.

3. *O. polita* Hall, from Wisconsin.



Figs. 1, 2.—Ventral valves. The beak is not seen in either of the specimens.

Fig. 3.—Diagram showing the position of the scars in the dorsal valves. All these figures are enlarged about $2\frac{1}{2}$ diameters.

The specimens exhibited the internal characters very imperfectly, yet enough was seen to convince me that the genus was a new one. During the fourteen years that have elapsed, I have received a number of letters, from both American and European authors, inquiring for more complete details of the structure of *O. chromatica*, which has always been considered to be the type. This information I was unable to give, for want of the facts. We are now in possession of specimens showing the interiors of both valves, almost completely. The following are the characters as nearly as they can be made out:

In the ventral valve there is a groove in the hinge line, for the passage of the pedicel. On each side of the groove there is a small, somewhat deeply excavated cardinal scar. In the cavity of the valve there are two elongated scars, which extend

* Geology of Canada, Palæozoic Fossils, vol, i, p. 7, 1861.

from near the cardinal scars forward about two-thirds of the length of the shell. These diverge from each other, more or less, in their extension forward, and are usually curved but sometimes nearly straight. They may be called laterals. They are, in general, separated from each other about one-third of the width of the shell. A little above the mid-length, and between the two laterals, there is a pair of small scars arranged transversely, with their inner extremities directed somewhat forward. The space above these two scars, between the upper portion of the laterals, is generally tumid from the thickening of the shell. In one of the specimens there is a small pit in the center of this space.

The dorsal valve has a small area, or nearly flat hinge facet. The minute beak is slightly incurved over the edge of the area. Beneath the beak there is a small sub-angular ridge, on each side of which there is a cardinal ? scar. The elongated scars, which seem to correspond to the laterals of the ventral valve, are here altogether in the upper half of the shell. They diverge widely in their extension forward. They are in general very slightly impressed, and would, most probably, escape the observation of any one who did not expect to find scars where they are situated. In the cavity of the valve there is a low rounded median ridge, which extends from a point near the hinge line forward a little below the mid-length of the valve. About the middle of the shell there are two small scars. These are usually striated longitudinally. The median ridge passes between them. The area is coarsely striated.

The above are the principal characters of this species, and they are subject to some variations, one of which is particularly worthy of notice. The two small cardinal scars of the dorsal valve are sometimes elongated laterally. This is carried to such an extent in another species (*O. gemma*) that they not only extend the whole length of the hinge-line, but are curved forward at their outer extremities and continued down into the cavity of the valve. In such cases they present an appearance similar to that of the groove beneath the hinge-line of the genus *Obolellina*. In other species of this genus the lateral scars of the dorsal valve are sometimes connected together by their upper extremities. But this is not a constant character. In different individuals, of the same species, these scars are either connected or not. The laterals are also sometimes connected with the cardinals.

The following are the original figures published in the Paleozoic Fossils, p. 7, (1861):



Fig. 4

Fig. 4, *a*, Ventral valve; *b*, dorsal; *c*, interior of ventral valve, showing the muscular impression; *d*, outline on a side view, restored from detached valves. Natural size.

In the description it is said: "Muscular impressions in the ventral valve, four; one pair in front of the beak, near the middle or in the upper half of the shell." The pair here alluded to are the laterals. Their upper and lower extremities are sometimes not visible, and what remains occupies the middle portion of the length of the shell. The expression "or in the upper half," I can thus explain: I had the dorsal valve of *O. crassa*, from Troy, which I then supposed to be a ventral valve. In this the laterals are in the "upper half." The transverse scars were not then observed and hence four scars instead of six. It must be borne in mind that fourteen years ago nothing was known of the internal characters of these shells. The materials were imperfect and consequently so was the description. It is now certain that the genus is a good one and that all of the three species on which it was founded belonged to it.

The described species which I consider to be truly within the genus are: *O. chromatica*, *O. polita*, *O. crassa*, *O. nana*, and *O. gemma*. They all, so far as is yet known, are confined to the *Potsdam Epoch*. A number of other species have been referred to the genus, but they are all more or less doubtful.

The specimens which have furnished the above additional details of the structure of *O. chromatica* were collected at L'Anse au Loup, the only place where the species has been found, in 1863, by T. C. Weston of our Survey, and by him very skilfully worked out of the matrix.