

radiating lines in the structure of the shell, and also concentric laminae of growth. They are all compressed in dark shale, and show only the interior surfaces of the valves, none showing the external surface. The latter is supposed to be lamellose or otherwise so roughened as to have caused it to adhere to the shale, while the smooth interior surface has readily separated in the plane of fission."

The outer surface of this species is minutely papillose, the papillae being arranged in a rough, quincunxial order or irregularly crowded together along the spaces between the concentric lines of growth. This surface was found on specimens from the typical locality at Antelope Springs, and also on others from Pioche, Nevada.

Acrothele granulata Linnarsson is a very closely related species, and it is difficult to give specific differences between them on a comparison of the ventral valves, which is all that has been found of the Swedish species.

Acrothele Matthewi Hartt (see United States Geological Survey, Bulletin No. 10, p. 15) is very much like *A. subsidua*. Like *A. subsidua*, the outer granulated surface is rarely seen, as it clings to the matrix, taking a thin coating of shell with it.

Formation and localities.—Middle Cambrian. Calcareous shale at Antelope Springs, Utah, in association with *Ptychoparia Kingi*, *Asaphiscus Wheeleri*, &c. At Pioche, Nevada, it is in an argillaceous shale with *Olenellus Gilberti*.

Genus OBOLELLA Billings.

Obolella Billings, 1861. Geology of Vermont, vol. ii, p. 946. *Idem*, 1865. Pal. Foss. vol. 1, p. 7. *Idem*, 1872. Can. Nat., new ser., vol. vi, p. 217. *Idem*, 1872. Amer. Jour. Sci., 3d ser., vol. iii., p. 355. *Idem*, 1876. Same jour. vol. xi, pp. 176-178. *Idem*, Hall, 1863. Sixteenth Ann. Rep. N. Y. State Cab. Nat. Hist., p. 131. *Idem*, Ford, 1881. Amer. Jour. Sci., 3d ser., vol. xxi, p. 131. *Dicellomus* Hall, 1873. Twenty-third Rep. N. Y. State Cab. Nat. Hist., p. 246. Type *O. crassa*.

Original description. "Generic characters.—Shell ovate-circular or subquadrate, convex or plano-convex. Ventral valve with a false area, which is sometimes minute and usually grooved for the passage of the peduncle. Dorsal valve either with or without an area. 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, and the others situated one on each side near the cardinal edge. Shell calcareous; surface concentrically striated, sometimes with thin extended lamellose ridges.

"In general form these shells somewhat resemble *Obolus*, but the arrangement of the muscular impressions is different. In *Obolus* the two central scars have their smaller extremities directed downwards, and converging towards each other, but in this genus the arrangement is exactly the reverse."

Type, *Obolella chromatica*.

Later, 1872, Mr. Billings redefined the genus; in 1876 he more fully