

Genus PROTOSPONGIA Salter.

Protospongia Salter, 1864. Quart. Jour. Geol. Soc., vol. xx, p. 238, pl. xiii.

PROTOSPONGIA FENESTRATA Salter.

Plate vi, figs. 2, 2a-b.

- Protospongia fenestrata* Salter, 1864. Quart. Jour. Geol. Soc., vol. xx, p. 238, pl. xiii, fig. 12a-b. *Ibid.*, Cat. Cambrian and Silurian Fossils, p. 3, 1873.
 Hicks, 1874. Quart. Jour. Geol. Soc., vol. xxvii, p. 401, pl. xvi, fig. 20.
 Zittel, 1877. Abb. der k. bayer. Akademie der Wiss., 2. Cl., xiii. Bd. "Studien ii. Fossile Spongien" (p. 45, sep. copy).
 Carter, 1877. Ann. and Mag. Nat. Hist., ser. 4, vol. xxv, p. 177.
 Brögger, 1878. Om paradoxidesskifrene ved Krekling. Separataftryk af Nyt Magazin for Naturvidensk., vol. xxiv, i, p. 20, t. 6, f. 14.
 Sollas, 1880. Quart. Jour. Geol. Soc., vol. xxxvi, p. 362, figs. 1, 2.
 Roemer, 1880. Lethea Geogn., 1. Th., p. 316, f. 59.
 Hinde, 1883. Cat. Fossil Sponges, p. 129, pl. xxviii, fig. 2.
 Walcott, 1884. Monographs U. S. Geol. Survey, vol. viii, p. 11, pl. ix, figs. 5, 5a, b.

Mr. Salter originally described this interesting sponge as having a loosely reticulate skeleton formed of very large cruciform spiculæ, the branches of which cross each other at an angle of 80° , and only in one plane, no ascending or descending branches rising from the point of conjunction. The angles occasionally vary, but not much.

More perfect specimens obtained by Dr. Hicks show the spiculæ to be quadri- or radiate, slightly raised at the center, and formed of four nearly cylindrical rays.

The skeleton, as described by Mr. Sollas, is composed of large primary spiculæ, with the interspaces filled in by three series of spiculæ, each formed of spiculæ smaller than those preceding it, their rays all lying regularly disposed in two directions at right angles to each other, and so building up a net-work with square meshes.

The skeleton is not preserved in any of the Nevada specimens, the different sized spiculæ lying scattered on the surface of the limestone shale or crowded together without any regularity in the direction of the rays or the size of the spiculæ. The spiculæ, however, appear to be identical in all respects with those described by Messrs. Salter, Hicks, and Sollas, and if they had not been scattered or crowded together by accident would form a skeleton similar to that described by Mr. Sollas. The under side of the spiculæ shows no trace of a fifth ray or its point of attachment, appearing in this respect like the upper side, except that the surface is a little concave instead of convex on the upper side. They are silicious and differ in mineral character from the spiculæ of the Cambrian rocks of Wales which have been replaced by pyrite.

Dr. Hicks states that *P. fenestrata* occurs in the Longmynd Group, in the Menevian Group, and also in the Upper Lingula flags to the base