

projecting spine ridge Disk puffed, densely and evenly beset, with very short, stout, conical spines, which to the naked eye seem nearly like large grains; scales and radial shields entirely covered. Eleven stout, blunt, regular, cylindrical arm spines, which, under the microscope, are slightly rough. Lengths to that of an arm joint, 3·5, 4·7, 4, 3·8, 3·8, 2·8, 2·5, 2·5, 2·5, 1·2, ·8 : 1·3. One very large, thick, pointed tentacle scale, over 1 mm. long. Colour in alcohol, pale rose-pink above; below yellowish.

Specimen from the distant station 145 differed only in having larger spines on the disk. A young one, with a disk of 7 mm., had only seven mouth papillæ to each angle; the additional papillæ at the outer end of mouth slit had not yet appeared; the disk spines were forked and thorny, and the eight arm spines were rough, and almost thorny.

Station 145.—December 27, 1873; lat. 46° 40' S., long. 37° 50' E.; 310 fathoms.

Station 236.—June 5, 1875; lat. 34° 58' N., long. 139° 30' E.; 420 to 775 fathoms; mud.

Station 308.—January 5, 1876; lat. 50° 10' S., long. 74° 42' W., 175 fathoms; mud.

Ophiacantha vivipara, Ljn. (Pl. XLVI. figs. 7-9).

Ophiacantha vivipara, Ljn., Om Tvänne Nya arter, Öf. Kong. Akad., p. 471, 1870; Lym. Bull. Mus. Comp. Zool., vol. v., part 7, p. 149.

Ophiocoma (?) *vivipara*, Wyv. Thom., Voyage "Challenger," Atlantic, vol. ii. p. 242, fig. 50.

As its name indicates, the species has always been known as viviparous.¹ It carries its young, until they are quite large, in the ovarial bursa (Pl. XLVI. fig. 8, Y), whence they often thrust an arm through the genital opening (*no.*). Plainly this is a mode of reproduction differing greatly in degree from that of the egg-laying species, where we find the ovarial tubes crammed with thousands of small ova. In the viviparous there is no room for such numbers, because the young become so large that a few of them occupy the entire cavity. They are evidently produced in a series. The vertical section at a right angle to an arm, cited above, shows, besides the large young, two embryos in pockets (Y', Y'), ready to take the place of the larger brood when it quits the mother. The bursæ are pleated bags having lime scales in their substance and adhering to the thickened wall of the digestive cavity (St). They pass upward over the arms; but do not force themselves between the roof of the disk and the digestive cavity, for the upper wall of the latter clings pretty closely to the roof and the under side of the radial shields (*l, l.*). A parallel cross cut made close to the edge of the disk (fig. 7) shows two of the bursæ ($\delta, \delta.$) as simple cracks passing upward, and having between them a lobe of the digestive cavity (St) which lies just over an arm. The third bursa (δ') has genital tubes or pockets, which lie over an arm. This section exhibits also one brachial and two interbrachial lobes of the digestive cavity, with their very thick pleated walls. A portion of these, highly magnified (fig. 9) showed rows of elongated oval cells, with long thread-like, or fibrous, or tubular prolongations, the whole resembling the liver cells of

¹ Ljungman, *loc. cit.*; Wyv. Thomson, *loc. cit.*