

Note on the Occurrence of *Echinus esculentus* above Low-tide Mark on the Cornish Coast.

By

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WHEN collecting on the shores in the Plymouth area, while a member of the Easter Class at the Marine Biological Laboratory, Plymouth, in 1921, I was struck by the absence above low-water mark of *Echinus esculentus*, as contrasted with its abundance in this zone at Port Erin in the Isle of Man; for there, as Chadwick states, "it may be collected by hand on the beach, and on the ruined breakwater at low-water of spring tides." There is no record of this species except below tide-marks in the "Plymouth Marine Invertebrate Fauna" list (*Journ. Marine Biological Association*, Vol. VII, 1904).

In 1849 W. P. Cocks, in the *Trans. Penzance Natural History and Antiquarian Society* ("List of Echinodermata procured in Falmouth and Neighbourhood from 1843 to 1849"), recorded the occurrence of this species thus:—

"*Echinus sphaera*.—Trawl refuse; common: young specimen found attached to stones, low-water mark."

Later (1887–8), in the same journal, G. F. Tregelles, in a paper on "Echinodermata of Mount's Bay," makes the following statement of the species of the genus *Echinus*: "The commonest and largest is *E. esculentus* (Pennant) [*E. sphaera* Forbes], which literally swarms off this coast at all depths. It is brought in by trawlers; it is found in crab-pots, into which it climbs laboriously after bait; the seaweed gatherers obtain them in from one to two fathoms of water. The Mouse-hole fishermen call them 'zarts,' doubtless an old Cornish word."

The Mousehole fishermen have told me that "zarts" are often found exposed at low-water on the shore of the islet lying off the village and also on the shore of the mainland opposite this island. Accordingly I took advantage of the spring tide of April 23rd, 1921, to visit the island at low-water, when I found two large specimens of *E. esculentus* exposed on the rocks in sheltered positions on the landward shore. The greatest diameter of one was 11·3 cms. in length, while its height measured 8·9 cms. The corresponding measurements of the other specimen were

11.5 cms. and 8.7 cms. respectively. The spines of both were tipped with green. Both were ripe females and discharged their eggs in captivity.

On September 4th of the same year, the tide being a good one, I found another large specimen of the species near low-water mark on the shore of the mainland sheltered by the island, and two other specimens were brought to me that had been found on this shore on the previous day. All were large, healthy specimens.

It should be mentioned that both these shores are sheltered on the west by the mainland, while the island acts as a breakwater on the east. This sheltered position may be connected with the occurrence of *Echinus esculentus* above low-tide mark in this locality. However, it is rather its apparent absence from the beach fauna elsewhere in Cornwall that calls for explanation. Two alternatives suggest themselves. Either the climatic conditions of Cornwall or the Cornish seas, as contrasted with those of the Isle of Man, are unsuitable to the occurrence of "zarts" in the tidal zone; or the general climatic conditions are suitable, and, except in the case of Mousehole, local conditions are unfavourable.

The solution of the problem would be made more possible by knowledge of the occurrence or absence of this sea-urchin between tide-marks at other parts of the British coast.