

test, more or less wide according to the size of the tubercles. The structure of the primary tubercles of the actinal surface, and their irregular arrangement in horizontal and vertical rows is very characteristic of the genus *Phormosoma*, and resembles in the most striking manner the arrangement and structure of the primary tubercles of *Archæocidaris* among the Palæechinidæ, showing that *Archæocidaris*, and perhaps *Eocidaris* and *Pholidocidaris*, are more closely related to the recent Echinothuridæ than the group of Palæechinidæ, to which *Melonites* and the like belong, which, as far as we can judge, from what we know of the structure of the apical system and of the actinal membrane, are more closely related to the Cidaridæ.

The presence of sheathed spines in two species of *Phormosoma* shows that this character, which at first sight seems to separate so strikingly from the rest of the species of the group *Asthenosoma grubii*, is evidently one of little value, and which may be more or less developed in specimens of the same species in the same state of growth.

In a specimen of *Phormosoma luculentum*, measuring nearly 160 mm. in diameter, the abactinal system measured 22 mm., the actinal opening 42 mm.; while in a specimen of *Phormosoma bursarium*, measuring 100 mm. in diameter, the abactinal system measured 28 mm., the actinal opening 40 mm. The smaller specimens of these two species collected from the same localities could readily be assigned to their respective species, yet more abundant material may prove that the differences noticed, although important, are simply individual characteristics partly due to age.

Station 200. October 23, 1874. Lat. 6° 48' N., long. 122° 25' E.; 255 fathoms; mud.

Station 205. November 13, 1874. Lat. 16° 42' N., long. 119° 22' E.; 1050 fathoms; bottom temperature, 2.4° C.; grey ooze.

Station 232. May 12, 1875. Lat. 35° 11' N., long. 139° 28' E.; 345 fathoms; bottom temperature, 5.0° C.; sandy mud.

**Phormosoma hoplacantha* (Pls. XI., XII., XII.^a figs. 10-13; Pl. XXXIX. figs. 3-7; Pl. XL. figs. 37, 38; Pl. XLIII. fig. 1; Pl. XLIV. figs. 28-31).

Phormosoma hoplacantha, Wy. Thomson, 1877, Voyage of Chall., Atlantic, vol. i. p. 148, fig. 35.

This is the largest Sea-urchin with which I am acquainted, it measures no less than 312 mm. in diameter, and when fully expanded must have been a striking object. This species is remarkable for the large size of the primary tubercles, arranged both on the actinal and abactinal surface of the interambulacral areas (Pl. XII.^a figs. 11-13) in horizontal rows; on the abactinal surface they are distant, separated by large secondaries and miliaries, irregularly arranged on the coronal plates (Pl. XII.^a fig. 13). Towards