

of the coronal plates is already markedly pistol-shaped, the sutures do not extend horizontally, or nearly so from one area to the other as they do in the other *Desmosticha*, and we can trace a slight bevel in the same direction as that of *Astropyga* in a section of the junction of adjoining coronal plates. In *Astropyga* the plates being narrower and more elongated, and, consequently, more numerous, the pistol shape of the coronal plates is very striking, and is as fully developed as in some stages of *Asthenosoma*, lapping slightly along the median line. Another very characteristic feature of the Echinothuridæ we also find in *Astropyga*. I have called attention to the splitting up of the interambulacral plates into irregularly shaped independent plates, thus producing interambulacral areas which, as in the Palæechinidæ proper, are composed of more than two vertical rows of plates. The fact that there are more than two vertical rows in the ambulacral areas in the *Desmosticha* as well as Palæechinidæ I have referred to on a former occasion. In *Astropyga* we find that the large interambulacral plates from the edge of the ambitus nearly to the abactinal system, as far as the external line of primary tubercles extends, are made up of two very distinct plates (Pl. X.^a fig. 9), so that in *Astropyga* as well as in *Phormosoma* we have an interambulacral area in which the vertical zones are not composed simply of two rows of plates but of four, and in which the primary tubercles of the actinal surface recall very strikingly from their deeply sunken areolæ, those of *Archæocidaris* and *Phormosoma*. *Astropyga* must therefore be considered a genus either belonging to the Echinothuridæ, or at any rate possessing some of the most characteristic features of both the Diadematidæ and Echinothuridæ. The interambulacral plates of the actinal surface of *Astropyga* differ from those of *Phormosoma* in which the primary tubercles are deeply sunken; but when seen from the interior, the deep hollow primary tubercles of the genus connect the solid tubercles of *Echinothrix* and *Diadema* with the hollow and deeply sunken tubercles of *Phormosoma* proper. The shorter and somewhat club-shaped spines of the actinal surface, like those of *Micropyga*, resemble somewhat the shorter hollow-tipped spines of the actinal surface of the Echinothuridæ.

In most of the *Desmosticha* with spherical tests a certain amount of bevelling occurs in the joints of adjoining plates, this bevelling corresponding more or less to the curvature of the test; and when there are a large number of plates in a thin test, the edges appear parallel, while the direction of the joints is readily traced in genera having few coronal plates and a comparatively thick test. In *Echinarachnius* the upper edge of the plates of the ambulacral system within the petals is inclined towards the abactinal system. It certainly seems impracticable to base a classification of the Echinoidea on this character of the imbrication or abutting of the coronal plates in the different groups of Echini as has been proposed by Keeping.¹

Both in the Cidaridæ and in the Echinothuridæ in which the imbricating plates of

¹ Palæozoic Echini, Quar. Jour. Geol. Soc. London, 1876, vol. xxxii. p. 40.