spicules as in the bulk of the Diadematidæ. In fact the Echinothuridæ strongly recall to us the embryonic stages of our regular Echinids (*Strongylocentrotus* and *Arbacia*) in which the distinction between the coronal plates and the actinal and abactinal systems does not exist, and in which the whole test is made up of plates of similar structure. The Echinothuridæ are somewhat more differentiated than the Perischoechinidæ, in which the coronal plates themselves are still very numerous and not reduced to the typical number of two plates for the interambulacral system, as in all the Echinoidea known at the present period; but even in the Echinothuridæ we still have a trace of this abnormal character of the Perischoechinidæ, of having a number of rows of plates in the interambulacral system.

Some of the species of the genus *Phormosoma*, in which the test is most flexible, such as *Phormosoma tenue*, show traces of an irregular subdivision of the coronal plates both on the actinal and abactinal sides (Pl. XIII. fig. 1, Pl. XIV. figs. 1, 2, Pl. XIX.[a] fig. 2). Diagonal or transverse lines are seen to run from one plate to the next, so as to subdivide the primary coronal interambulacral plate into two or three, and sometimes four or five secondary plates; each one of these secondary plates corresponding usually to a primary or secondary tubercle. This breaking up of the primary plates, of course, gives to the test a much greater mobility than it had before in spite of the extreme tenuity of the test (Pl. XVIII.[a] figs. 4, 5, 7, 8). These secondary plates, although extremely thin round the edges, are strengthened in the centre by a deposition of carbonate of lime forming a circular button in the centre (Pl. XVIII.[a] fig. 4), to strengthen that part of the plate which carries the primary tubercles and spines. This splitting up of the coronal plates into plates corresponding each to a primary tubercle exists also to a certain extent on the actinal surface of *Astropyga*, though it has not to my knowledge been noticed before. The thickness of the inner and outer fold of the cuticle of the test forms lines more or less coincident with the secondary plates of the interambulacral areas (Pl. XIV. figs. 1, 2; Pl. XVIII.[a] fig. 7). This gives us, I think, a natural explanation of the structure of the coronal interambulacral areas of the Perischoechinidæ, only in this group the splitting up of the primary interambulacral coronal plates was quite regular, and the lines of sutures are regularly placed as in the ambulacral system. It is remarkable that in the Spatangoids, the Clypeastroids, and all the higher Petalosticha, the arrangement of the plates of the ambulacral system should have remained comparatively simple as well as in the most embryonic group of the Desmosticha, the Cidaridæ and Salenidæ, while in the Perischoechinidæ, the Echinothuridæ, and by far the larger number of the Desmosticha, the arrangement of the plates of the ambulacral system is quite complicated, and the number of rows of plates across the ambulacral areas greater than that of the interambulacral areas (which are, of course, limited to two in the bulk of the recent Desmosticha).

Grube and Thomson have already called attention to the similarity in the structure of the teeth of the Echinothuridæ and Diadematidæ. Thomson has figured the teeth of *Phormosoma placenta* (Porcupine Echinids, Trans. Roy. Soc., 1874, pl. lxiii. figs 9, 9*a*), and I have