

analogy of the plates of the young Starfish to those of the Crinoids, and which he has most suggestively extended to the Echinids, and which most naturally explains the great number of plates we find both on the ambulacral and interambulacral plates of the Palæechinidæ, in which, as in the Crinoids, the plates composing the calyx subdivide into numerous joints or into numerous plates to form the test of our oldest known Sea-urchins, which thus still show most unmistakably their systematic affinity to the Crinoids.

Unfortunately, in the types with thin coronal plates (*Eocidaris*, *Archæocidaris*, &c.), owing to the loose cuticle by which these plates were probably connected, much as we find them in the modern Echinothuridæ, it is not probable that we shall find whole tests, as even in the recent types when they are dried the plates readily become disconnected, and we can form no idea of their shape when alive even from well-preserved alcoholic specimens. The abactinal system especially of these genera will very rarely be well preserved, and we can only from analogy with the recent types form an idea of the principal structural features of that part of the test. The plates of the actinal system generally hold together more firmly, and from the similarity of its structure in such genera as *Archæocidaris*, *Pholidocidaris*, and *Lepidesthes*, we can fairly assume that the abactinal system corresponds in its general features with that of the Echinothuridæ. As far as I can judge from the specimens of Palæechinidæ in my possession which have retained any part of the actinal region of the test adjoining the actinostome, we find that in *Lepidocentrus* there is no distinct line of division separating the coronal interambulacral plates from those belonging to the actinal membrane. The ambulacral plates are continued in a remarkably well-preserved specimen from the Lower Burlington Limestone to the very teeth, and the same is the case with the interambulacral plates; neither the ambulacral nor the interambulacral plates show any line of demarcation such as we still find in the Cidaridæ or such an indistinct one as exists in the recent Echinothuridæ, and as far as I could see in the specimen referred to, the test of this genus was evidently composed of entirely similar plates, extending from the edge of the actinostome, from the very membrane which was attached to the teeth to the abactinal system, that is, the coronal plates extended from the actinostome without the usual subdivision of the actinal membrane into ambulacral and interambulacral plates which in this genus at least did not exist. In fact this genus corresponds exactly to a stage of the Cidaridæ in which the coronal plates as they are developed in that family should be reduced to a minimum, and replaced by the extension over the whole test of imbricating plates, such as still exist prominently developed in the Cidaridæ, and to a more limited extent in some other Echinids, on the actinal membrane. In the Cidaridæ proper the junction of these plates with the coronal plates is still quite well marked, while in the recent Echinothuridæ the distinction between them is much less apparent. As regards the actinal system of *Melonites*, from what we know of its structure from Meek and Worthen, it apparently belonged to the same type as that of *Lepidocentrus*.