

glance appear to indicate very widely differing structural characters. In the same way, widely separated as *Archæocidaris* and *Oligoporus* appear, the existence of such genera as *Lepidocentrus*, and *Pholidocidaris*, shows that even the characters which at first sight so strongly contrast in *Melonites* and *Archæocidaris* may gradually disappear, although undoubtedly the type to which *Melonites*, *Oligoporus*, *Palæechinus*, and the like belong would lead us more directly, as far as the structure of the coronal plates is concerned, to the abutting plates of the Echinids of the present period, which, as I have attempted to show, are really all to a certain extent bevelled at the edges. This bevelling depends first upon the curve of the test and in the second place upon the thickness of the test, while such decidedly imbricating coronal plates as those occupying the actinal surface of the test in *Archæocidaris* and the like, and on which we find also a single large primary tubercle developed, lead us directly to the Echinothuridæ, and to such types as *Phormosoma*, which are evidently not very different in their structure from the Silurian *Archæocidaris*; and at the present day the Diadematiidæ, especially *Astropyga*, still retain traces of the existence of more than two rows of interambulacral plates and of the imbrication of the coronal plates, within the ambulacral and interambulacral areas, so prominently developed in the Echinothuridæ of the present day. This is not the only family in which we find interambulacral areas with more than two rows of coronal plates. In the remarkable genus *Tetracidaris* of Cotteau, the double row of interambulacral plates on each side of the median line is not limited as in *Astropyga* to a few plates on the actinal sides of the test. In that genus we find only a short part of the interambulacral area near the abactinal part of the test where the normal number of interambulacral plates are present, while in the rest of the test, with the exception of the few plates near the apical system, the interambulacral areas consist of four rows of primary plates.

The very peculiar splitting of the vertical rows of coronal plates noticed by Quenstedt in *Melonites*¹ seems to point to some structural peculiarity in the Palæechinidæ such as I have described in the breaking up of a single interambulacral plate in our recent Echinothuridæ. It shows, at any rate, what some of the other genera of Palæechinidæ plainly show, that we find it impossible to define the number of rows of coronal plates in the test just as we find it impracticable near the apical system of the regular Echinids to ascertain how many rows of interambulacral plates there are present, as they appear in that region of the test packed in as they best can find place and take up their regular and symmetrical arrangement only later, while we may observe that in the Palæechinidæ this symmetrical arrangement never takes place, the vertical rows of plates running in as best they can, thus forming another important embryonic character of the Palæechinidæ.

From an embryological and palæontological standpoint perhaps no more important view has been taken than that of Lovén regarding the nature of the apical system of the Echinidæ, which he developed from a comparison I had at first indicated of the complete

¹ Quenstedt, Pal. Deutsch., 1872 to 1875, vol. iii. p. 381.