

Discoideæ and the Clypeastroids, and compare them to the true Spatangoids, it seems impossible any longer to lay stress upon the characters which have mainly led palæontologists to adopt these two great primary divisions. As has already been pointed out by Lovén, the variations introduced are greatest on the actinal surface, and greatest in the posterior region of the test. In the Echinoidea the first trace of such a want of symmetry on the actinal side is found in the Echinometradæ, while on the abactinal surface the position of the anal plate in certain genera of Echinids, especially of the anal plate in the Salenidæ, indicates very early the tendency to an asymmetrical development which culminates in the Spatangoids of the present day. The next stage in this asymmetrical development is due to the exclusion of the anal system from the apical system, and the corresponding marked distinction at once existing among the Discoideæ in the arrangement of the plates of the odd posterior interambulacral area, and the compact apical system thus formed, which becomes the basis of the subsequent modifications it undergoes on the one side in the Clypeastroids, from the soldering of the plates by the spreading of the madreporic body, and the exclusion of the genital openings from the apical system, and their appearance in the apical part of the interambulacral region; and on the other either into the compact apical system of the recent Spatangoids or the disjunct apical system of the Collyritidæ.

In the Clypeastroids the asymmetry of the plates is almost entirely limited to the posterior interambulacral area, and the further extensive development of the coronal plates of the test which is limited to the whole of the actinal surface, and not to a single area as in the Spatangoids proper.

Passing from the Discoideæ to the Cassidulidæ we find there a further modification of the actinal surface from that of the former group extending to the actinostomic plates which still exists at the present time; and the first trace also of a more distinct petaloid system than we find among the Collyritidæ. The asymmetry of this group is limited to the actinal surface, and to the odd interambulacral area. If we further examine the older Spatangoids we find that in all the more globular genera, such as *Hemiaster*, there is a marked uniformity in the size and number of the coronal plates; though by no means so great as that in the Collyritidæ or such genera as *Galerites* and the like, of which the deep-sea genera belonging to the Pourtalesiæ, such as *Cystechinus* and similar forms, may be considered as the representatives; and thus we little by little pass from genera in which the actinal plastron differs only slightly from the other interambulacra, *Cassidulus*, *Holaster*, *Pourtalesia*, *Genicopatagus*, and *Hemiaster* to the genera with a more marked actinal plastron, such as *Palæostoma*, *Agassizia*, and *Spatangus*, and finally to *Meoma*, *Brissopsis*, *Echinocardium*, *Brissus*, &c. It by no means follows, however, that the specialisation of the ambulacral petals has kept pace with this elongation of the actinal plastron, as can readily be noticed on comparing such widely-differing genera as *Echinocardium*, *Spatangus* and *Schizaster*, which are all characterised by this highly-developed