

former uniform extension of the ambulacral pores as far as the actinostome. In the structure of the apical system, the subanal plate can still be traced in some of the stages of growth, while in *Temnopleurus* it never becomes entirely obliterated. In *Temnopleurus* we might say the Salenid abactinal system was more readily traced, and still better in *Arbacia*, while in both these genera the Cidarid features of large primary tubercles is retained in a different degree, and in *Arbacia*, in one part of the ambulacral zone, the arrangement of the pores is of an ancient type, while towards the actinostome its petaloid structure is eminently recent; the structure of the ocular plate of *Arbacia* leads us back directly to the structure of the ocular plate in the oldest Palæechinidæ.

The affinities of the Clypeastridæ with the Discoideæ are clearly indicated by the development of the longitudinal axis, which dates from the exclusion of the anal from the apical system. We readily trace through *Pileus*, *Holectypus*, and *Discoidea* affinities to *Galerites* and the fossil Conoclypeidæ, while with the appearance of *Galerites*, *Fibularia* and *Echinocyamus* we have the element of the Clypeastridæ and Scutellidæ; and their relationship to the Cassidulidæ is well shown in the simple ambulacral system of some of the genera, and the rudimentary auricles still to be traced among the Echinolampadæ, while the affinity of the earliest Cassidulidæ, *Hybochlypus*, *Galeropygus*, and the like, to *Pygaster*, which culminate in our day with but slight modifications in *Echinoneus*, show how clearly related the earlier Spatangoids were with the genera to which the Clypeastroids are most closely related, which in their turn still show a most unmistakable relationship to the Desmosticha, so much so that it seems difficult to say whether some of the Echinolampadæ of the present day are not more closely related to the Galeritidæ, from the slight development of the petaloid system and the presence of jaws or of rudimentary auricles.

Already, in the Jura, *Pygaster* shows the method of the passage of the anal system from the interior of the anal ring to the odd interambulacral space, and we find genera such as *Holectypus* and *Discoidea*, in which it occupies in succession all possible positions between the apical system and a place close to the actinostome; and the passage once effected in the Clypeastroids, we readily go from a mere circular or elliptical opening placed either in the axis, or obliquely or transversely to it, to an opening in a slight groove or a more or less deep groove occupying this same odd interambulacral space, having its climax in the Echinobrissinæ, and then we most naturally pass to an opening holding a certain relation to a more or less distinct beak which, combined with the subanal plastron enclosed by the subanal fasciole, we can gradually trace from a simple plastron flush with the test, as in the earliest Holasteridæ, to the Echinocardidæ, to the Brissinæ, and finally to the Pourtalesidæ, to a plastron extending as a slight beak below the anal system, and finally forming a more or less distinct snout; and when this is combined with the deep anal groove of other Spatangoid genera we get the remarkable forms such as we have described as belonging to the Pourtalesidæ.