

plastron, of an anal snout, of a beak or rostrum, and the formation of an actinal lip; connected with these beaks and plastrons are the accumulation along certain lines of bands of miliaries, the fascioles, which can be traced far back in the formation of the so-called miliaries in the first place, and their accumulation at certain points, and finally, their enclosing certain definite areas. If we trace the existence of the slight groove of the anterior part of the test, we go back to the Chalk, and the time when the odd posterior ambulacra began to be developed at a different rate from the others, and to retain its primitive character. The petaloid structure of the lateral ambulacra dates back to the Jurassic period, when the ambulacral areas above the ambitus differed in their proportions from those of the actinal surface of the test. The petaloid structure of the ambulacra adjoining the actinostome began with the oldest Cassidulidæ, and the simple ambulacral pores which connect the actinal and petaloid ambulacral plates we find in a part of the ambulacral zone in the earliest Cretaceous Spatangoids. But the other characters with which the various structural features still found in *Spatangus* are connected in the older genera where they occur are of a very different degree of intensity, and have many of them developed in directions which no longer occur, and have formed types which have become extinct, though the special structure which has been modified still exists.

The peculiar internal appendage which represents the auricles in Spatangoids, and the whole dental system, is reduced to a simple spur, and is the only trace of the complicated dental apparatus which we find in the oldest known Echinids, and which in another direction has remained but little modified up to the present day. Taking in a similar way one of the most characteristic of the older genera, *Ananchytes*, we can also trace backwards to their first appearance, as we have done for *Spatangus*, the genera in which the characteristics of the genus *Ananchytes* are first developed; but we can likewise trace in *Ananchytes* its affinities to the recent Spatangoid genera, and find in the structure of the apical system of the ambulacra, of the anal system, of the actinal plastron, and of the actinostome, indications of lines of development which date back to the genus *Ananchytes*, and which are still to be traced at the present day even though *Ananchytes* is at the present time extinct. Another such characteristic genus is *Pygaster*, in which the whole line of the Clypeastroids is to a certain extent foreshadowed, although if we compare the Clypeastroids to the earlier Echinids, we shall find a far greater number of identical points of structure than when comparing such a recent genus as *Spatangus*.

Adopting the other method, and tracing the development of a single structural feature at a time, such as the growth of the poriferous zone, from the simple paired zone to the complicated ambulacral zone of a Spatangoid, we shall find that the most primitive ambulacral zone known still exists side by side with the existence at the present day of the resultants, if we may so say, of all the combinations which have taken place. In the same way the earliest modifications of the coronal plates of the Palæechinidæ are found to-day to exist in several of the recent Desmosticha, along with a test made up of such a specialised set of