

analysis. These types thus seem on that account to have been introduced suddenly, perhaps, from the great prominence assumed by any one of the Echinodermal structural characters. Characters of very different degree of prominence in the older types, which, slightly modified, might radically affect the structural features of any group.

The modifications of the anal system, of the genital and ocular plates of the test, of the poriferous zone of the actinal system, of the jaws, and so on, do not go on *pari passu*, but, on the contrary, vary not only in every sub-order, but in every family and genus; consequently, modifications of the coronal plates which affect greatly the outline of the test, and culminate in the Spatangoids, may be combined with other features of very little systematic value in that group such as the position of the anal system. In the same way in the Clypeastroids, the structure of the ambulacra, so widely different from that of the Desmosticha, is found combined with jaws, and again in the Spatangoids a very simple ambulacral system may be combined with an arrangement of the coronal plates, showing the greatest degree of specialisation. We cannot hope, therefore, to trace the development of any type through a series of forms, each slightly different from its predecessor; we must only expect to be able to follow the changes of a single feature, and study it in its combinations with other features, combinations which from their very nature can never form an unbroken series, as their terms are not synchronous; combinations which can never be links in any chain beyond the link formed by any one special character in tracing its modifications alone.

It is only in the Archæocidaridæ that we find in the structure of the poriferous zone structural features which have remained unaltered to the present day in all recent Spatangoids, viz., the simple pairs of pores which we find in the Cidaridæ, in the Clypeastroids, and in the Spatangoids; in the Palæechinidæ we find small tubercles characterising a whole group of genera; this structural feature, the absence of permanent primary tubercles, still exists at the present day in the highest of our Petalosticha, and is found uninterruptedly in genera living from the oldest time to the present day.

The apical system which we find in the Palæechinidæ still occurs at the present day, but little modified in the Cidaridæ, Arbaciadæ, Diadematidæ, and the tendency to throw the anal system outside of this system is already hinted at in the excentric position of the anal opening in the anal system; and the compact abactinal system so characteristic of the recent Spatangoids and Clypeastroids is already foreshadowed in the encroachment of the madreporite on several of the genital plates. The specialisation of the plates of the two areas, which takes its greatest development in the petaloid ambulacra of the Petalosticha, can also be traced in a rudimentary form in the double ocular pore of the ocular plate of the abactinal system, the structural features characteristic of the mode of junction of the coronal plates of the Desmosticha, and of the Petalosticha, is also to be traced in the construction of the coronal plates of the test of the Palæechinidæ. The characteristic subdivisions of the test of the Desmosticha into actinostome, coronal and