

abactinal regions also exists in these earliest Echinoidea, though it is so modified as to show us how the existence of but a single peristomic system (*Bothriocidaris*) gradually passes into the *Palæechinus* stage, next into the *Cidaris* stage, and finally the *Echinus* stage, and also how it is possible for the peculiar development of the test of the *Petalosticha* even to be foreshadowed in the absence of lines of demarcation between these systems in the *Palæechinidæ*, and finally, how the existence of an anal system in one of the interambulacral areas, while calling to mind an eminently crinoidal structural feature, yet at the same time shows the intimate relationship there may have existed between the earliest *Spatangoids* and the immediate successors of the *Cystechinidæ*, which thus also may be the precursors of the excentric development of some of the *Desmosticha*, and of the whole of the *Clypeastroids* and *Spatangoids*.

If we examine in the same manner any one of the structural features which have once made their appearance, we find that, without exception, they are either persistent to the present day, or can be traced in a somewhat modified form in some one of the types now living, though the peculiar combination of any definite number of these may have disappeared, and thus radically new elements may seem to have been introduced into certain periods, which are after all only excessive modifications of a single element of structure, which in other forms remains unmodified. This will explain, perhaps, more vividly than any systematic descriptions of affinities the subtle connections which close examination of almost any genus of Sea-urchins at a special period shows not only to the past but also to the future, and the endless links which can readily be traced by a careful analysis between apparently totally disconnected types. Let us take as an example one of the most recent genera,—the genus *Spatangus*,—and see how far back we can trace the structural features, modified so as to be characteristic of *Spatangus*.

The compact abactinal system we can, as I have already stated, trace to the encroachment of the madreporite upon the different genital plates, and the gradual driving out of the anal system into the odd interambulacral zone; or we may go further back and trace this asymmetric arrangement back to its crinoidal affinities, this unequal development of the different radial and interradial zones dating back to the earliest Echinodermal structure, and being also naturally connected with the excentric position of the apical system of the actinostome, and the elongation of the test. The strong contrast between the actinal and abactinal surface goes back to the existence of the earliest *Desmosticha*. The existence of large primary tubercles dates back to the *Archæocidaridæ*, that of small primary tubercles uniformly distributed over the test goes back to the *Palæechinidæ*, the presence of spines of two different kinds is as old as the earliest Sea-urchin, as well as the specialisation of certain parts of the poriferous zone, and the existence of a specialised actinostome.

The development of an actinal plastron dates back to the *Galeritidæ*, to the first disturbing element which the introduction of the anal system into the odd interambulacral area brought in, and connected with that comes in the development of an anal