

The genital plates and the ocular plates, as well as the madreporic body, make the numerous combinations which have been so well traced by Lovén, and which culminate on the one side in such a compact apical system occupied mainly by the madreporic body, as we have it in the Clypeastroids, in which the genital openings in some cases no longer retain a definite position in distinct plates, but may open anywhere in the interambulacral spaces; a state of things whose possibility is already foreshadowed in the genera belonging to types early developed, such as *Cidaris* and the Echinothuridæ. On the other side they culminate in the great specialisation of the ocular and genital plates and their disturbance by the interambulacral plates, encroaching between them, and little by little forming an excessive separation of the ambulacra into a bivium and a trivium, until little by little it becomes again quite compact owing to the more equal development of the coronal plates near the apical system. As Lovén has well shown in the older Echinids (*Cidaris* and *Salenia*), we find all the proof we need of the crinoidal character of the apical system of the Echinidæ; the calyx being more and more unimportant, though it always reveals its typical features.

In the Clypeastroids the calyx, though reduced again to its lowest limits, that is, completely confused, still retains a few traces of its originally crinoid character, and in the earliest appearance of the Spatangoid calyx we have introduced the embryonic element of the structure of the calyx, which we find in late types of the present day, and which recalls to us an arrangement of the plates of the calyx found in the Starfishes only. The excessive splitting of the arms of an Ophiuran bring the abactinal madreporite to a position adjoining the actinal opening.

#### FASCIULES.

Fascioles as such are recognised only among the Spatangoids, but it is very probable that such striking accumulations of miliary tubercles as we find on the edge of some of the *Phormosomas* must be regarded as the first trace of fascioles, which we would thus be led to consider as accumulations of miliary tubercles along certain lines, as we find them in some genera of Spatangoids where their course is not well defined, until at last they assume the fixity and clear definition which we consider so characteristic of our Spatangoids of the present day. As far as my observations go they do not entirely agree with those of Lovén regarding the fixity of their position and the identity of their course in older and younger specimens. Certainly, from what we have seen in the young of *Hemiaster cavernosus*, both the course and position of the peripetalous fasciole is widely different in the older and younger stages. In the one case the fasciole encloses the anal system, in the other it is placed outside it. I have also shown the presence of such rudimentary fascioles in Starfishes,<sup>1</sup> so that fascioles are not confined to Echinids.

Alex. Agassiz, N. Am., Starfish, Cont. Nat. Hist. U. S., vol. v.