the actinal membrane are pierced for the passage of ambulacral tentacles, new plates for this membrane are formed by becoming detached from the ambulacral zones. It is readily seen on examining a large *Asthenosoma* how the small ambulacral plates of the poriferous zone become isolated and gradually increase in size laterally, until they eventually meet the corresponding plates from the adjoining ambulacral zones; and thus, in spite of the increasing size of the actinal opening with advancing age, it is kept covered by the newly-formed plates detached from the edge of the test at the point of contact with the actinal membrane. These plates extend on one side towards the median line of the ambulacral zone, and in the other direction meet on the median line of the interambulacral zone. In the younger stages there are plates in the extension of both the ambulacral and interambulacral areas.

Lovén and Ludwig have shown that the imbrications of the plates so characteristic of the Palæozoic Echinoidea is not completely lost, even in Spatangoids; and from the peculiar mode of growth of the plates, regularly concentric round a nucleus, a thinner edge is formed, which maintains by its encroachment on adjoining plates a considerable degree of mobility in the tests of the globular Spatangoids during their growth. And when we go back to the very earliest stages of growth of the plates composing the test of Echinids, when they are made up of mere Y-shaped rods, we can readily see that the lapping of the coronal plates is a feature very characteristic of all Echinoid structures from the very nature of the basis of the calcareous plates composing the test; whether it be in a Palæozoic *Echinus*, a *Cidaris*, a Spatangoid even, or a Crinoid, a Starfish, or a Holothurian, it is found occurring in all the plates.

The gills pass as in the Diadematidæ proper between the edge of the plates of the test proper and the imbricating plates of the actinal membrane, though the openings through which they pass can scarcely be called cuts; they are small indentations, the result of the space left between the curved edge of the last interambulacral plate, and the next plate of the actinal membrane, or of the notch formed by the overlapping of the extremity of the last plate over the side of the next coronal plate. The gills appear at a very early stage; in the youngest specimens, they are mere digits, or a simple fork in the smallest specimens I have examined. The gills become quite prominent in some of the species (see Pl. XIX.[a] fig. 1, *Asthenosoma tessellatum*). New plates of the anal system, on the contrary, appear to form next to the anal opening, and are gradually pushed away towards the genital plates, though evidently additional plates are also formed by the splitting of the older and larger plates, especially those adjoining the abactinal extremity of the interambulacral area.

Judging from the large size of the genital openings and the large size of the eggs in one of the species, this group of Sea-urchins is probably viviparous; and we find here also, in the great distance at which the genital openings are placed from the anal system, some-