

the interambulacral area being clearly marked by the two large tubercles at the extremity of these areas on the abactinal edge of the fasciole. The whole fasciole was covered by a coarse granulation. The most striking feature in the structure of these small Echinids is the position of the anal opening (Pl. XX.^a fig. 9). This is nearly in the central part of the abactinal surface towards the posterior edge, and entirely surrounded by the fasciole. This fasciole, from its position, must undoubtedly be the peripetalous fasciole, as it agrees in position with the same fasciole in *Brissopsis*, though in the latter genus it does not enclose the anal opening. In the adult *Hemiaster* the anal opening is not thus surrounded, an additional example of the little value we can place upon the position of the anal opening as a systematic character. The transfer of the anal opening to the exterior of the fasciole I was not able to trace, all the specimens being too young to show when it took place. There is no trace in these young stages of any genital openings, or of genital plates; the ocular plates are somewhat more prominent than the other ambulacral plates, one especially, that of the odd ambulacrum (see Pl. XX.^a fig. 9). On opening one of these young Echinids (Pl. XX.^a fig. 11) we find that, notwithstanding the position of the anal opening, the intestine already makes a half circuit round the edge of the test, and is attached to the sides by the usual mesenteries, the actinal extremity of the alimentary canal towards the anterior end being free; the stone canal also leads nearly vertically from the anal opening to a terminal interambulacral plate situated to the right of the odd ambulacrum. The anal opening is large, pentagonal, separating completely the trivium from the bivium, and is covered by a large plate having a small opening opposite the left posterior ambulacrum.

“The only other young Spatangoid known, resembling so closely a regular *Echinus*, is a young Spatangoid figured by Müller, while still in the pluteus stage, with straight spines similar to these figured here in the youngest specimen. This was the first indication we had of the great similarity of the spines of the young stages in the regular and irregular Echinids. The presence of an anal opening in the young *Hemiaster* connected, so to speak, with the abactinal system, is a most interesting feature, as well as the complete separation of the bivium and trivium, the origin of which among Echinids had not been understood. The whole family of Collyritidæ, in which this is the normal state, appear in geological times as an abnormal group, disconnected entirely, and isolated from all the other Spatangoids, which it precedes in time, and seeming thus far to have no connection with the Spatangoids of later geological periods. Their connection as an embryonic stage is now clearly shown by the young of *Hemiaster*, here figured, as well as the close relationship existing between the regular Echinids and such Spatangoids as *Collyrites*, appearing as the earliest geological representatives of the Spatangoids. The Collyritidæ are, therefore, not structurally so far removed as has been generally supposed from the regular Echinoidea.

“The earlier development, that preceding the stage when the embryo escapes into