

from the large size and the opacity of the egg and embryo it is not a very favourable species for observation, had other conditions been favourable we had all the material for working out the earlier stages in the development of the young very fully. The eggs, on being first placed in the pouches, are spherical granular masses of a deep orange colour, enclosed within a pliable vitelline membrane, which they entirely fill. They become rapidly paler in colour by the development of the blastoderm; they then increase in size probably by the imbibition of water into the gastrula cavity, and a whitish spot with a slightly raised border indicates an opening which I have no reason to doubt is the permanent mouth, but of this I cannot be absolutely certain.

“The surface now assumes a translucent appearance, and becomes deeply tinged with dark purple and greenish pigment, and almost immediately, without any definite intermediate steps, the outer wall is filled with calcified tissue; it becomes covered with fine spines and pedicellariæ, a row of tentacular feet come into action round the mouth, the vent appears at the posterior extremity of the body, and the young assumes nearly the form of the adult. These later changes take place very quickly, but they are accompanied by the production of so much heavy purple and dark green pigment that it is difficult to follow them. The viscera are produced at the expense of the abundant yelk, and the animals at once take a great start in size by the imbibition of water into the perivisceral cavity. The young urchins jostle one another on the floor of the breeding pouch, those below pushing the others up until the upper set are forced out between the rows of fringing spines of the pouch, but even before leaving the marsupium, on carefully opening the shell of the young, the intestine may be seen already full of dark sand, following much the same course which it follows in the adult. The size of the test of the young on leaving the marsupium is about 2.5 mm. in length by 2 mm. in width.”

To give as fully as possible the history of this species the accompanying description of the changes due to growth are reprinted from a notice on the Viviparous Echinids, from Kerguelen Island,¹ describing the early stages of this species.

“The function of the deeply sunken petaloid ambulacra of several genera of Spatangoids, such as *Moiria*, *Schizaster*, *Hemiaster* and the like, has thus far remained unknown. Philippi in 1845, while describing some South American Spatangoids, found in the deeply sunken posterior ambulacra of *Hemiaster cavernosus* minute Echinids, which he regarded as the young of the species, though they differed widely from the adults, and seemed, from their shape and the nature of their spines, to approach nearer the regular Echinids than the Spatangoids. Echinids of this genus being but rarely found in collections, no opportunity occurred of verifying the observations of Philippi. A somewhat analogous observation was made by Grube, who described more in detail the young of *Anochanus* (*Echinobrissus*), which he found living under very similar circumstances, in a cavity opening in the abactinal pole of the specimens. No details of

¹ A. Agassiz, 1876, Proc. Am. Acad., p. 231.