

median ambulacral and interambulacral spaces, leaving only here and there traces of its former existence. The variation in the length of the spines is also very marked, so that many specimens would at first sight readily pass as *Cidaris papillata* (Pl. II. fig. 1). It was one of these varieties of *Goniocidaris canaliculata* which Thomson described and figured as *Cidaris nutrix* in his Voyage of the Challenger, vol. ii. pp. 226, 227 (fig. 42). There is nothing constant in the connection of these features. We find specimens with long spines and deep median vertical furrows, and the reverse.

Studer (Berlin Akad. Monatsb., 1876, p. 455) has noticed from Kerguelen Island and the coast of Patagonia two species of *Goniocidaris* (*Goniocidaris membranipora* and *Goniocidaris vivipara*), both of which I am inclined to refer to *Goniocidaris canaliculata*. The existence of large genital openings covered by a thin membrane (*Goniocidaris membranipora*) to facilitate the passage of the viviparous young, had not been noticed in the older descriptions, and the differences upon which he separates *Goniocidaris vivipara* from *Goniocidaris membranipora* do not seem to be constant, judging at least from the great variation in the size and position of the genital and ocular plates in the specimens collected by the Challenger, and from the great variation in the length as well as ornamentation of the radioles. Thomson¹ and Studer² published about the same time notices that *Goniocidaris* was viviparous, and that the young were carried upon the abactinal system, protected by the upper spines of the test, until their full development had taken place.

On Plate II. are figured three of the most characteristic types of *Goniocidaris canaliculata*, one (fig. 1) with long slender cylindrical spines, some of them twice the diameter of the test. Fig. 2 represents from the abactinal side a specimen with comparatively short radioles, scarcely two-thirds the diameter of the test in length, but the ornamentation of the spines is similar to that of the long cylindrical spines of fig. 1. Both these specimens were covered with comparatively coarse papillæ. In fig. 3 is represented a specimen with much finer and more numerous papillæ, and also slender but short spines. Among the many specimens collected by the Challenger, all possible combinations of fine and coarse papillæ, with slender, long, or short, or with stout and short radioles, were observed, showing, as in other species of the family, a most extensive degree of variation, while in other Cidaridæ with extremely variable spines the characteristic features of the test are tolerably constant. In this species the variation is not limited to the primary radioles and papillæ, but extends also to the ornamentation of the test. This shows, as I have mentioned above, a median suture in all possible stages intermediate between a broad suture (Pl. III. fig. 4), or a deep sharply cut groove (Pl. III. fig. 6), and an almost indistinct bare space (Pl. III. fig. 5).

An interesting account of the mode of carrying the young in this species is given by Thomson (Voyage of the Challenger, vol. ii. p. 228). "The eggs, after escaping from

¹ Journ. Linn. Soc., vol. xiii., June 1876.

Berlin Akad. Monatsb., July 1876.