

brought to light the fact that it is by no means the only genus of deep-sea Cirripedia.

What has been added to our knowledge of the anatomy and embryology of the Cirripedia since the publication of Darwin's book?

The beautiful researches of Krohn¹ are no doubt the best published on the anatomy of the Cirripedia since that date; they contain a detailed description of the cement-apparatus of *Lepas* and *Conchoderma*, and for the first time an accurate description of the female genital organs of *Lepas* and *Balanus tintinnabulum*. It is well known that Darwin² hesitated to accept the results which Krohn arrived at with regard to the opening of the oviduct into the sac at the base of the first pair of cirri. The exactness of Krohn's description was acknowledged by Kossmann,³ after having been disputed by Pagenstecher.⁴ I may add that the opening of the oviduct into Darwin's "auditory sac" requires very delicate dissecting, but that once achieved, a microscopic preparation may be made of the sac with the oviduct attached to it. In one of my preparations the oviduct, at a short distance from the sac, contains ovarian eggs. As was accurately stated by Darwin, the sac often contains a proportionally large and laterally flattened second sac, the opening of which is directed towards and attached to the opening of the oviduct in the outermost sac. Of course, since the supposition of Darwin as to the auditory function of the whole apparatus must be abandoned, his opinion as to the nature of this sac cannot be accurate. Krohn supposes that this innermost sac is furnished with a very elastic wall, which, when the sac is full of eggs, dilates very considerably, and loosens itself from the attachment of the oviduct, forming in this way the ovigerous lamellæ.

Kossmann, on the contrary, calls this shoe-shaped sack a "Klumpen," i.e., an irregularly-shaped mass. According to him, this, if not totally solid, is only furnished with very irregular cavities, which cannot be filled with eggs from the oviduct. Even if one of these cavities were in direct communication with the oviduct, the contractions of the latter could never develop the force necessary to swell out the body till it formed the very tender cuticle which encloses the eggs of the Lepadids. The mass does not show a trace of a cellular structure, and though very extensile, it is very tough also, and offers great resistance to any tearing with needles. The mass is evidently the product of an aimless secretion of the epithelium-cells of the sac at the extremity of the oviduct. When the eggs pass through the oviduct these cells

¹ Krohn, A., Beobachtungen über den Cementapparat und die weiblichen Zeugungsapparate einiger Cirripeden *Archiv. f. Naturgesch.*, Jahrg. xxv. 1859.

² Darwin, Ch., On the so-called "Auditory-Sac" of Cirripedes, *Nat. Hist. Review*, 1863.

³ Kossmann, R., Suctoria und Lepadidæ, *Arbeit. zool. zoot. Instit. Würzburg.*, i., 1874.

⁴ Pagenstecher, A., Beitrag zur Anatomie und Entwicklungsgeschichte von *Lepas pectinata*, *Zeitschr. f. wiss. Zool.*, Bd. xiii. 1863.