

supposed arms and pinnules which were described by Hall as *Myelodactylus*¹ as a coiled up stem of peculiar structure. It may perhaps belong to some Crinoid of which the head is not yet known; but until Salter's statements² have been satisfactorily refuted by Hall or Miller, I cannot admit the Myelodactyloidea as a class of Echinoderms equivalent to the Crinoidea, Ophiuroidea, or Blastoidea.

The Echinoderms which have no tube-feet in their ambulacra, and are more or less permanently attached by their aboral surface, seem to me therefore to fall very naturally into three classes, Crinoidea, Cystidea, and Blastoidea. They have several characters in common which sharply distinguish them from the other Echinoderms, and serve to define the branch or division PELMATOZOA, Leuckart, which is of course synonymous with Crinoidea in the widest sense.

I am indebted to my friend Prof. F. Jeffrey Bell for the reference to Leuckart's original definition of the group. I heard the name first from Sir Wyville Thomson, who was greatly struck with its appropriateness, and introduced it into the syllabus of his class lectures. He could, however, give me no reference to it; but Prof. Bell was fortunately able to find it in Leuckart's Bericht über die wissenschaftlichen Leistungen in der Naturgeschichte der niederen Thiere for 1864-65, where the Echinoderms are divided into *Pelmatozoa*, *Echinozoa*, and *Scytodermata* (Holothurians). Working back from this year Prof. Bell eventually succeeded in tracing back this classification of Leuckart's to a morphological essay published in 1848, where, however, the familiar name ACTINOZOA is used to denote the Urchins and Starfishes together. After alluding to the essential characters of the Pelmatozoa, *i.e.*, the presence of a stem either temporarily or permanently, Leuckart referred to the two orders of this class, the Cystids and the true Crinoids.³ The latter is distinguished by the fact that "An dem obern peripherischen Rande des Kelches noch besondere zahlreich gegliederte Arme sich vorfinden, deren Skeletstücke immer dem Perisom angehören und stets von dem dorsalen Pole ihren Ursprung nehmen." In this description of the Crinoids, as well as in the prominence given to the presence or absence of a stalk in the morphology of the Echinoderms, Leuckart seems to me to have been peculiarly fortunate. The only point to which one might be disposed to take exception, and it is in reality more a verbal one than anything else, is his description of the arm-skeleton as belonging to the perisome; for the term "perisomatic" skeleton is now somewhat limited in its meaning (*ante*, p. 73).

The Pelmatozoa therefore differ altogether from other Echinoderms in the presence of a stem, and in the consequent departure from the ordinary habits of an Urchin, Starfish, or Holothurian. Whether sessile, or provided with a stem, the Crinoid lies on its aboral surface, instead of creeping about mouth downwards in search of food. The lateral

¹ Palæontology of New York, 1852, vol. ii. p. 191, pl. xlii. figs. 5, 6.

² Catalog. Camb. Silur. Foss. Woodw. Mus., Cambridge, p. 118.

³ Ueber die Morphologie und die Verwandtschaftsverhältnisse der wirbellosen Thiere, Braunschweig, 1848, p. 42.