

**Linopneustes* (*Paleopneustes*).

Paleopneustes, A. Agassiz, 1873, Bull. Mus. Comp. Zool., vol. iii. No. 8, p. 188.

Since the preliminary examination of the specimens associated as *Paleopneustes murrayi*, A. Agassiz,¹ I have referred to the same species a couple of smaller specimens which throw considerable light on the specific characters of this species, and show that both the peripetalous fasciole and the subanal exist in the smallest specimen examined (Pl. XXXV.^b fig. 9), so that it seems best for the present at least to place this species in a sub-genus of *Paleopneustes* (*Linopneustes*) differing from *Paleopneustes* in having both a peripetalous and a subanal fasciole, until we know something more of the changes due to growth in *Paleopneustes* proper. I am the more inclined to do this as the typical *Paleopneustes*, forming as it does a link between the Ananchytidæ and Spatangidæ, appears fossil in the Tertiaries, Dames² having described a species of *Paleopneustes*, which differs from the recent West Indian species in being more elongated and having a flattened test and more petaloid ambulacra, resembling, in fact, more in its outline the smaller specimens of *Linopneustes murrayi*, in which the test is comparatively flatter than in the older stages, agreeing also with those younger stages in having fewer and proportionally larger tubercles on the abactinal side of the test. The sub-genera *Linopneustes* and *Paleopneustes* stand related to each other much as *Pericosmus* and *Macropneustes* do as far as relates to the existence of a peripetalous fasciole.

The relations between *Paleopneustes*, *Linopneustes*, *Platybrissus* and *Eupatagus* are extremely instructive; as I stated in the description of small specimens of *Linopneustes murrayi*, these resemble *Eupatagus* in having a peripetalous and a subanal fasciole, they agree, however, with *Paleopneustes* in not having petaloid ambulacra. The flattened tests of *Platybrissus* and of *Eupatagus* connect them with the younger stages of *Linopneustes*, and the facies of tuberculation of *Linopneustes* agrees well with that of *Platybrissus*, while *Platybrissus* and the typical *Paleopneustes* agree in not having fascioles, while the semipetaloid anterior lateral ambulacrum of *Platybrissus* forms the passage between such petaloid ambulacra as we find in *Paleopneustes*, *Asterostoma*, and *Oviclypeus*, and the petaloid ambulacra of *Eupatagus*, *Spatangus*, *Maretia*, *Nacopatagus*, and the like, the petals of which are all more or less open at the extremity and sometimes even show a slight tendency to divergence.

It seems evident from the descriptions of Cotteau and D'Orbigny that there are two distinct types in *Asterostoma*, one of which may prove identical with the typical *Paleopneustes*,³ while the other type is represented by what Dames has called *Oviclypeus*,⁴ which has the peculiar ambulacral furrows on the actinal surface mentioned by Cotteau in his original description of the genus *Asterostoma*.

¹ A. Agassiz, 1879, Proc. Am. Acad., vol. xiv, p. 210.

² Dames, 1877, Palæontog., vol. xxv. pl. viii. fig. 1.

³ A. Agassiz, 1874, "Haasler" Zool., Results, Ill. Cat. Mus. Comp. Zool., No. 8.

⁴ Dames, 1877, Palæontog., vol. xxv. pl. x. fig. 1.