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ON THE OCCURRENCE OF THE GENUS *PALÆASTER*  
IN THE UPPER SILURIAN ROCKS OF VICTORIA.

By R. ETHERIDGE, JUNR.

(Plate xxx.)

THE Upper Silurian rocks of Victoria have so far yielded two species of Asteroidea, and one well defined species of Ophiuroidea, whilst a second doubtful species of the latter class is believed to exist. The former are *Petraster Smythii*, McCoy,\* from the Moonee Ponds beds, and *Urasterella Selwynii*, McCoy,† from near Kilmore. The single described species of the second class is *Protaster brisingoides*, Gregory,‡ from Moonee Ponds, the doubtful one being a MS. name *Tæniaster australis*, McCoy. It has been suggested that this is merely a synonym of Gregory's *P. brisingoides*.

In the genus *Palæaster*, Hall, the structure of the arms on the actinial side consists of two rows of ambulacral plates, and two rows of adambulacral plates, bordered on each side by a row of marginal plates. In *Urasterella*, McCoy, adambulacral plates are present as in *Palæaster*, but marginal plates do not exist. In *Petraster*, Billings, on the other hand both adambulacral and marginal plates are developed, but separated by a row of disc plates; while in *Palasterina*, the disc itself is much extended, and the adambulacral plates in the interradial angles are large and triangular.

I now purpose describing a star-fish in the Museum Collection, from Moonee Ponds, which certainly appears to have the structure of *Palæaster*, Hall, rather than that of either of the genera named.

*PALÆASTER MERIDIONALIS*, *sp. nov.*

(Pl. xxx., fig. 16 & 17.)

*Sp. Char.*—Body small; rays moderately long and rather acutely pointed, fifteen millimeters from the actinial centre to the apices; interbrachial angles broad and obtuse; abactinial surface unknown. Ambulacral avenues wide in comparison to the size of the body, deep, very gradually tapering, the sides more or less straight walled; ambulacral plates about twenty in number on each side, transversely oblong, bearing more or less pyriform pores; adambulacral plates quadrangular, smaller than the marginal plates, placed along the prominent edges of the ambulacral avenues;

\* Prod. Pal. Vict., Dec. I., 1874, p. 41, t. 10, f. 1.

† *Ibid.*, p. 42, t. 10, f. 2 and 3.

‡ Geol. Mag., 1889, vi. (3), p. 24.

marginal plates transversely elongated, slightly supra-marginal in position, and thus partially visible dorsally, diminishing very gradually in size towards the apices of the rays; interbrachial marginals apparently two in number, much larger than the others, and generally triangular in shape; oral plates not distinctly visible, but apparently lanceolate.

*Obs.*—This elegant little Star-fish, the first of its genus described from Australian rocks, in form and proportions generally resembles *Palæaster matutina*, Hall,\* from the Trenton Limestone, but Hall gives very few particulars of its actinial surface. From *P. Shæfferi*, Hall,† from the Hudson River Group, and *P. eucharis*, Hall,‡ characteristic of the Hamilton Group, our species is separated on the one hand by the much more transverse form of its ambulacral plates, and proportionately wider ambulacral avenues; and on the other by its much smaller size. The latter feature will likewise serve as a point of separation from *P. granulatus*, Hall,§ also a fossil of the Hudson.

Amongst other American species, to which *P. meridionalis* is far more nearly allied than to the British, *P. niagarensis*, Hall,|| is easily distinguished by its large boss-like marginal plates. *P. antiquatus*, Locke,\*\* and *P. exculptus*, Miller,†† are much too large to need comparison. In *P. Dyeri*, Meek,‡‡ are similar transverse ambulacral plates to those of our species, but the adambulacral and marginal plates are quite different to those of the latter. It is hardly necessary to institute a comparison with such a well-marked form as *Palæaster Jamesi*, Dana,§§ for in this species there are enormously developed adambulacral plates, or at least, what appear to be so.

It is unnecessary to compare *P. meridionalis* with any of the so-called British Palæasters, for the Star-fish so far referred to the genus by English authors, do not, in the opinion of the Writer, belong to that genus, with one exception. The latter is *P. caractaci*, Salter, and this unfortunately is a MS. name. It has already been shown by Prof. H. A. Nicholson and the Writer, that *Palæaster* as understood by Salter, and those who followed him is not *Palæaster*, Hall, and we therefore instituted a new genus for the reception of the British species.||||

*Loc. and Horizon.*—Moonee Ponds, near Melbourne, Victoria.

*Coll.*—Australian Museum.

\* Twentieth Ann. Report State Cab. Nat. Hist. Univ. N. York, 1867, p. 283, t. 9, f. 2.

† *Ibid.*, p. 284, t. 9, f. 1. ‡ *Ibid.*, p. 287, t. 9, f. 3 and 4. § *Ibid.*, p. 285.

|| Pal. N. York, 1852, ii., p. 247, t. 51, f. 21.

\*\* Proc. Acad. Nat. Sci. Philadel., 1846, iii., p. 33.

†† Journ. Cincinnati Nat. Hist. Soc., 1881, iv., p. 69, t. 1, f. 1.

‡‡ Ohio Geol. Report, Pal. I., Pt. ii., p. 58, t. 4, f. 2—2f.

§§ *Palasterina*, Man. Geology, 1875, 2nd Edit. p. 205, f. 375; Meek gives a good figure of this, *Loc. cit.*, t. 4, f. 4.

|||| Mon. Sil. Foss. Girvan in Ayrshire, 1880, Pt. 3, p. 318.

DESCRIPTION OF PLATE XXX.

RHIZOPHYLLUM AUSTRALE, *Etheridge, fl.*

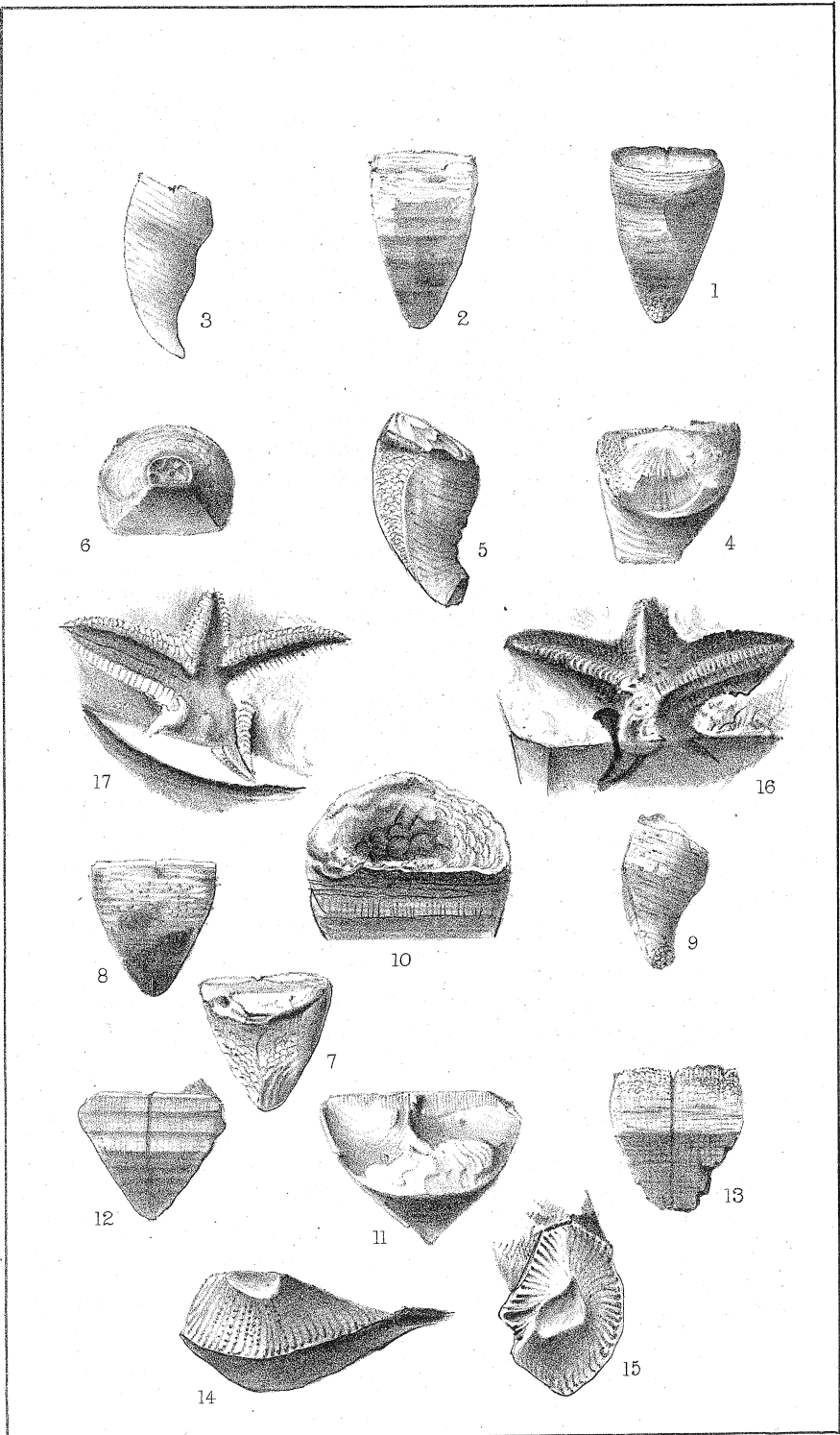
- Fig. 1. The corallum, dorsal view,  $\times 2$ .  
,, 2. ,, ventral view,  $\times 2$ .  
,, 3. ,, lateral view,  $\times 2$ .  
,, 4. Remains of an operculum, seen from above,  $\times 2$ .  
,, 5. The corallum lateral view, displaying the vesicular tissue,  $\times 2$ .  
,, 6. Section of the apex, showing the septa, cardinal septum and vesicular tissue,  $\times 3$ .

RHIZOPHYLLUM INTERPUNCTATUM, *De Koninck.*

- Fig. 7. The corallum, dorsal view, with the epitheca removed, displaying the infundibuliform layers of vesicular tissue,  $\times 2$ .  
,, 8. ,, ventral view,  $\times 2$ .  
,, 9. ,, lateral view,  $\times 2$ .  
,, 10. The calice, filled with vesicular tissue,  $\times 2$ .  
,, 11. Another calice, with the counter septum and worn septa exposed on the ventral wall,  $\times 2$ .  
,, 12. The corallum, ventral view, showing the position of the counter septum, and transverse bands of growth,  $\times 2$ .  
,, 13. A similar view,  $\times 2$ .  
,, 14. Internal cast of the calice, ventral side, with the granulated entire septa,  $\times 2$ .  
,, 15. The same seen from below, showing both the dorsal and ventra septa.

PALÆASTER MERIDIONALIS, *Eth. fl.*

- ,, 16. Impression of the actinial surface,  $\times 2$ .  
,, 17. Mould taken from specimen,  $\times 2$ .



G. H. BARROW, del.