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TWO NEW AUSTRALIAN CRINOIDS.

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The collections made by the German steamship *Gazelle* in the Australian seas included a number of unstalked crinoids taken on the zoologically little known coast of West Australia.

Through the courtesy of Drs. W. Weltner and R. Hartmeyer of the Königl. Zoologisches Museum at Berlin, and of Dr. Th. Studer of Berne, these crinoids have been submitted to me for study. There are among them two interesting new species, both belonging to characteristic littoral East Indian genera.

***Ptilometra dorcadis* sp. nov.**

*Antedon macronema* 1889. STUDER, Die Forschungsreise S. M. S. *Gazelle*, III Thiel, p. 185.

*Type*.—Cat. No. 2,964 (part), Königl. Zoologisches Museum, Berlin.

Centro-dorsal columnar, 6.5 mm. in diameter at the base by 3 mm. long, the sides slightly convex, the large polar area flat, 5 mm. in diameter; cirrus sockets closely crowded, arranged in fifteen columns of two or three each, the sockets in each column tending to alternate with those in the neighboring columns.

Cirri xxxv, 93, 55 mm. to 60 mm. long, stout basally, but tapering distally; first joint very short, about four times as broad as long, the following gradually increasing in length to about the eighth to thirteenth, which is squarish, then remaining similar or becoming very slightly longer than broad, until about the thirty-fifth, then very gradually decreasing in length, the terminal forty or so being about twice as broad as long; proximal joints smooth, without dorsal or ventral spines; at about the thirty-fifth the median distal dorsal border begins to become prominent, this feature gradually becoming more pronounced, resulting in dorsal spines on the later joints resembling those of *P. macronema*; opposing spine large, prominent, blunt, directed anteriorly, arising from the entire dorsal surface of the penultimate joint, equal in length to the anterior diameter of that joint; terminal claw nearly as long as the two preceding joints, slender, slightly curved.

Disk and brachial ambulaera naked; covering and side plates well developed in the distal half of the pinnule ambulaera.

Ends of the basal rays visible as rhombic tubercles in the angles of the calyx, but not projecting above the general surface of the radials; radials rather prominent, nearly four times as broad as long, gently concave anteriorly; 1 Br<sub>1</sub> about twice and one-half as broad as long, the straight lateral edges in apposition; 1 Br<sub>2</sub> (axillary) rhombic, about twice as broad as long, the lateral edges about one-half as long as those of the 1 Br<sub>1</sub>; 11 Br 2, in the type developed on the right side of three of the 1 Br series, on both sides of one of the 1 Br series, but absent from the fifth 1 Br series. Division series and first two brachials exteriorly with a uniformly produced narrow border, by which they are in lateral apposition, though they are not laterally flattened.

Arms 15 in number (in the type) about 55 mm. long; brachials in general as in *P. macronema*, but sharply rounded dorsally in the distal half of the arm instead of sharply carinate, the long overlapping spines of that species being represented by insignificant tubercles on the median part of the distal edge of each joint. Syzygies occur between the third and fourth brachials, again between the twelfth and thirteenth or thirteenth and fourteenth, and distally at intervals of five to seven (usually six or seven) oblique muscular articulations.

P<sub>1</sub> 8 mm. long, stiff, rather small, with nine joints, the first not quite so long as broad, the second slightly longer than broad, the third twice as long as its proximal diameter, the remainder greatly elongated, except for the minute terninal joint; P<sub>2</sub> 12 mm. long, much stouter than P<sub>1</sub>, with nine joints, similar in proportion to those of P<sub>1</sub>; P<sub>3</sub> the longest on the arm, 13 mm. or 14 mm. long, with eleven joints, of similar proportions to those of the two preceding pinnules; P<sub>4</sub> 11 mm. long (intermediate in length between P<sub>1</sub> and P<sub>2</sub>), with eleven or twelve joints, the first twice as broad as long, the second squarish, the following gradually increasing in length, becoming greatly elongated distally; succeeding pinnules similar to about the middle of the arm, then becoming more slender, slightly less stiff, and decreasing in length distally to about 9 mm. P<sub>1</sub> is occasionally absent, in which case P<sub>2</sub> is much smaller than usual.

*Color* (in spirits).—Dull purple.

*Type locality*.—Turtle Bay anchorage, north coast of Dirk Hartog Island, west Australia; 7 fathoms.

*Remarks*.—*Ptilometra doreadis* is very easily distinguished from *P. macronema* of the eastern coast of Australia by the very long cirri which are much stouter basally, the proportionately much greater length of the lower pinnules which are longer than, instead of shorter than, the distal, and especially by the large size of P<sub>3</sub> and the elongation of the joints in all the pinnules, these never being so long as wide in *P. macronema*, even distally. The absence of dorsal carination and of overlapping spines on the brachials gives the arms a somewhat different appearance. Its remarkably robust aspect differentiates it from *P. macronema* in about the same degree that that species is differentiated from *P. trichopoda* and *P. pulcherrima* of the Philippine Islands.

The type of *P. macronema* was taken at King George's Haven, in southwest Australia, while all the very numerous specimens I have examined are from the eastern coast, mostly from Port Jackson or Sydney; there is therefore a possibility that the present species will turn out to be the true *macronema*, in which case the form from Sydney would require a new name and might appropriately be known as *Ptilometra mülleri*.

***Oligometra studeri* sp. nov.**

*Type*.—Cat. No. 2,964 (part), Königl. Zoölogisches Museum, Berlin.

Centro-dorsal thin, discoidal, the bare polar area flat; cirrus sockets arranged in a single marginal row.

Cirri XII, 16–18, 7 mm. long; first joint very short, the following gradually increasing in length to the sixth or seventh, which, with the remainder, is squarish; on the third or fourth a low transverse ridge, subterminal in position, is developed; this gradually moves, in three or four joints, to a median position, at the same time gaining slightly in height; distally this ridge progressively decreases in width, and on the last four joints before the penultimate becomes a low median spine. The ridges on all the joints appear as low spines in lateral view. Opposing spine median in position, arising from the entire dorsal surface of the penultimate joint, in height equal to about half the diameter of that joint, much longer than the short spines on the preceding joints; terminal claw rather stout, slightly longer than the penultimate joint, abruptly curved basally, but becoming more nearly straight distally.

Ends of the basal rays not visible; radials concealed in the median line, but visible in the angles of the calyx; 1 Br<sub>1</sub> oblong, short, about four times as broad as long, the lateral edges straight; 1 Br<sub>2</sub> (axillary) broadly pentagonal, almost triangular, about twice as broad as long; synarthrial tubercles slightly developed.

Arms 10, 45 mm. long; first two brachials wedge-shaped, slightly over twice as broad as the exterior length, the first interiorly united for rather more than the proximal half, diverging at an obtuse angle distally; third and fourth brachials (syzygial pair) slightly longer interiorly than exteriorly, about twice as broad as the median length; following three brachials oblong, about three times as broad as long, then becoming obliquely wedge-shaped, and after the twelfth triangular, slightly broader than long, and in the terminal part of the arm wedge-shaped, about as long as broad. After the tenth the brachials develop rather prominent and slightly overlapping distal ends, but this character gradually dies away after about the middle of the arms. Syzygies occur between the third and fourth brachials, again between the ninth and tenth, and fourteenth and fifteenth (the former sometimes omitted), and distally at intervals of four to seven (usually five) oblique muscular articulations.

P<sub>1</sub> about 4.5 mm. long, slender, evenly tapering and becoming flagellate in the distal portion, with about sixteen joints, the first two rather over twice as broad as long, the third nearly as long as broad, the following gradually increasing in length, being about twice as long as broad

distally;  $P_2$  6 mm. long, stouter and stiffer than  $P_1$ , being, in fact, the largest and longest pinnule on the arm, with about eighteen joints, the first two approximately twice as broad as long, the third squarish, the remainder about half again as long as broad; the pinnule is smooth, the joints being without lateral processes or everted ends;  $P_3$  3 mm. long, small and weak, nearly as large basally as  $P_1$ , but tapering more rapidly, with thirteen joints, the first short, the following increasing in length to the fourth, which is squarish, and further increasing to a length of about twice the breadth in the terminal portion; following pinnules similar, soon becoming more slender and gradually increasing in length; distal pinnules very slender and hair-like, about 7 mm. long, with twenty-three joints, the first short and crescentic, the second nearly as long as broad, slightly less in diameter anteriorly than posteriorly, the third squarish, the remainder about half again as long as broad, becoming about twice as long as broad in the distal portion.

*Color* (in spirits).—Brownish-purple, the cirri and dorsal surface lighter.

*Type locality*.—Dirk Hartog Island, west Australia; 7 fathoms.

*Remarks*.—This new form is readily distinguishable from the ten previously described species of the genus; the elongate  $P_1$  of *O. bidens*, as well as the two dorsal processes on its cirrus joints, the very numerous cirrus joints of *O. gracilicirra*, the short stout cirrus joints of *O. pinniformis*, the single dorsal spine on the few stout cirrus joints of *O. caribbea*, the strong imbrication of the brachials of *O. imbricata*, and the spines or lateral processes on the proximal pinnules of *O. gracilicirra*, *O. carpenteri*, *O. japonica*, *O. pulchella* and *O. serripinna* separate them at once. The elongate proximal pinnules described in *O. adeonæ* would serve to differentiate it, if *adeonæ* should be shown to really belong to the genus *Oligometra*.

*Oligometra studeri* is most closely related to the group of species typified by *O. serripinna*.