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ON A NEW ASTEROID FROM QUEENSLAND.

By

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(Plates xvii-xix.)

Goniodiscaster integer sp. nov.

(Pl. xvii, figs. 1–2.)

Description.—R. = 71 mm.; r. = 26·5 mm.; br. (at base of ray between third and fourth superomarginals and including the projecting inferomarginals) 21·5 mm. R. = 2·6 r. and 3·3 br. Rays equal in length, except in one case where the measurement falls short by 2 mm.

Disc moderately and evenly elevated. The rays taper gradually and evenly towards their free extremity. Interbrachial arcs moderately rounded. The papular areas, which are not noticeably distinct, are confined to the abactinal surface. The papular pores number from three to nine to an area. The areas are more distinct, and the pores in them more numerous, in the distal two-thirds of the ray. The pores are less distinct on the disc and not so numerous as on the rays. The papular areas extend along the ray to the second or third last superomarginal plate.

The plates of the abactinal surface are evenly and systematically arranged. A pentagon of one to six spine-like granules with bare conical tips occurs on the centre of the disc. The plates within the area formed by the pentagon are indistinct. The median radial or carinal series of plates commences in each case at one of the five granules or groups of granules forming the pentagon, and extends down the ray in a distinctive manner to end near the tip of the ray at or between the third and fourth last superomarginal plates. The median radial plates number twenty-two to a series; twenty-three in one case. They are fairly large in size on the disc but gradually become smaller as they continue along the ray. The series of plates lying next to the median radials are noticeably smaller, except near the tips of the rays, where all the plates are more or less of equal size. This second series ends, in the majority of cases, at the fifth last superomarginal. A third radial series containing three or four plates ends at the third superomarginal. One or two plates occur between the third series of radial plates and the plates bordering the interradial furrow. The plates bordering the interradial furrow are arranged in four pairs, the upper pair being always the largest, and also the largest on the abactinal surface. The lowermost pair are about the same in size as the radial plates lying next to them. The interradial furrow is conspicuous. The madreporite is oval in shape; it is situated in the interradial furrow between two of the groups of granules forming the pentagon, and measures 5·5 mm. across its widest part.

The granulation of the abactinal surface is coarse and uneven. The area within the pentagon, in addition to being heavily clothed in rounded granules, contains several conspicuous and blunt tubercles. Other plates of the abactinal surface are also clothed in granules of varying sizes, the big ones, almost approaching tubercles in size, being very common and prominent. The granules in the papular areas are small and of even size. The superomarginal plates increase very slightly in size as they proceed towards the tip of the ray. None are definitely swollen or enlarged near the tip. The superomarginals, which

number fifteen, are finely, evenly, and smoothly granulated except for the last five or six, which always bear a few noticeably larger granules. The inferomarginals correspond to the superomarginals. They project slightly beyond the superomarginals, prominently so in the interbrachial arc. The inferomarginals are granulated in a similar manner to the superomarginals and possess here and there minute pedicellariæ which have the appearance of split granules. The last seven or eight inferomarginals, particularly the last three, bear very large and prominent granules. These granules, in some cases, may be termed tubercles, on account of their comparatively large size and pointed extremities.

The plates of the actinal surface, with the exception of those near the margin, are very clearly defined and clothed in larger granules. Many plates bear, in addition to the granules, small pedicellariæ which agree in character with those found on the inferomarginals.

The adambulacral armature bears three distinct series of spines. The spines of the furrow series number six to a plate, the outermost one on either side being very short and small. These furrow spines are very slender and round. Behind the furrow series there are two or three large blade-like spines which are about twice as wide as long and webbed for a small portion of their length. Behind this second series there is a third series of spines, numbering two or three to a plate and having the appearance of granules rather than spines. Behind these again there occur spine-like granules of indifferent sizes, which are oddly placed and comparatively small. Situated on the inner side of each adambulacral plate, usually between the furrow comb and the series of spines placed immediately behind it, is a long forcep pedicellaria which has the appearance of an elongated spine split longitudinally.

Colour in life.—The collectors have explained that the colour in life varies, but notes were taken of the colour of one specimen, the holotype. They are: abactinal surface sage green; granules of pentagon dark green; margins slate colour. Actinal surface of disc brown; actinal surface of rays creamy white.

Growth variation.—Specimens with greater R. measurement than the holotype have the extreme tips of the rays considerably compressed laterally. The papular areas, particularly on rays, are more conspicuous and more deeply seated. The pentagon of tubercles on the disc may be entirely absent. The abactinal plates are not so clearly defined, but their central granules are enlarged to such an extent that the plates appear to be very distinctly swollen.

Material examined.—Five specimens. R. = 99 mm.; r. = 37 mm. R. = 86 mm.; r. = 34 mm. R. = 71 mm.; r. = 26·5 mm. R. = 64 mm.; r. = 27 mm. R. = 55 mm.; r. = 23·5 mm. The specimen with R. = 71 mm. has been selected as the holotype. All the specimens are housed in the Australian Museum, Sydney.

Remarks and Affinities.—It is not without hesitation that a new name has been considered necessary to accommodate the series of five specimens before me. The close relationship to *G. pleyadella* is obvious and it was first considered likely that the five specimens were but variations of that species. The smallest specimen approaches very closely to *pleyadella* in the shape of one ray (see plate) but the remaining rays are normal and characteristic of the other four specimens. In order to make an attempt to settle the question definitely, a loan of one of Bell's original specimens of *P. validus*, which was sunk as a synonym of *pleyadella* by Dr. H. L. Clark in 1909, was granted me by the authorities of the Museum of Comparative Zoology, Harvard, Cambridge, Mass., U.S.A. (see Pl. xix, figs. 3–4).

Even the acquisition of this specimen did not entirely clear up the doubt first experienced but it has at least been the means of furnishing the following table, which, it seems, separates the two forms sufficiently to venture a specific separation. Döderlein's (1896) largest specimen of *pleyadella* from Thursday Island is the same as the specimen of the species loaned to me from America (Bell's *validus*) and this certainly points to the conclusion that the true *pleyadella*, when in the adult condition, is constant, thus making the table below more reliable.

Characters of *G. pleyadella*.	Characters of *G. integer* sp. nov.
Rays comparatively short and stumpy; not noticeably tapering. Papular areas markedly sunken. Granulation of abactinal surface comparatively fine and even.	Rays longer in comparison and noticeably tapering. Papular areas on a specimen about the same size as one of *pleyadella* not markedly sunken. Granulation of abactinal surface coarse and uneven. Abactinal plates bear granules much larger than those between the papular pores.

It seems necessary to point out that there are in the collections of the Australian Museum two juvenile specimens (R. = 18 mm. R. = 20 mm.) of the genus *Goniodiscaster* from Whitsunday Passage, Queensland, which are identical with Döderlein's figures of juvenile *pleyadella* from Thursday Island (see Pl. xviii, figs. 1–2). The occurrence of young *pleyadella*, assuming that Döderlein's juveniles and the two before me are correctly determined, in a locality so close to Port Curtis, where the type of *integer* was collected, makes the question of the characteristics of young *integer* very interesting.

Localities.—Dredged in Port Curtis, Queensland, 12 fathoms; December, 1929; collected Messrs. W. Boardman and M. Ward (three largest specimens). Near Peel Island, Moreton Bay, Queensland (two smallest specimens).

EXPLANATIONS OF PLATES.

PLATE XVII.

Fig. 1.—*Goniodiscaster integer* sp. nov. Abactinal surface of holotype (Austr. Mus. Catal. No. J: 5499). Slightly under natural size.

Fig. 2.—*Goniodiscaster integer* sp. nov. Actinal surface of holotype. Slightly under natural size.

PLATE XVIII.

Fig. 1.—*Goniodiscaster pleyadella* (Lamk.). Abactinal surface of juvenile specimen from Whitsunday Passage, Queensland (Austr. Mus. Catal. No. J: 5315 part). R. = 20 mm. Slightly over 1·5 natural size.

Fig. 2.—Actinal surface of same specimen. Slightly over 1·5 natural size.

Fig. 3.—*Goniodiscaster integer* sp. nov. Abactinal surface of the largest specimen, a paratype (Austr. Mus. Catal. No. J: 5500). Slightly over 1·5 natural size.

Fig. 4.—*Goniodiscaster integer* sp. nov. Abactinal surface of one of two specimens from near Peel Island, Moreton Bay, Queensland (Austr. Mus. Catal. No. G: 11502). Natural size.

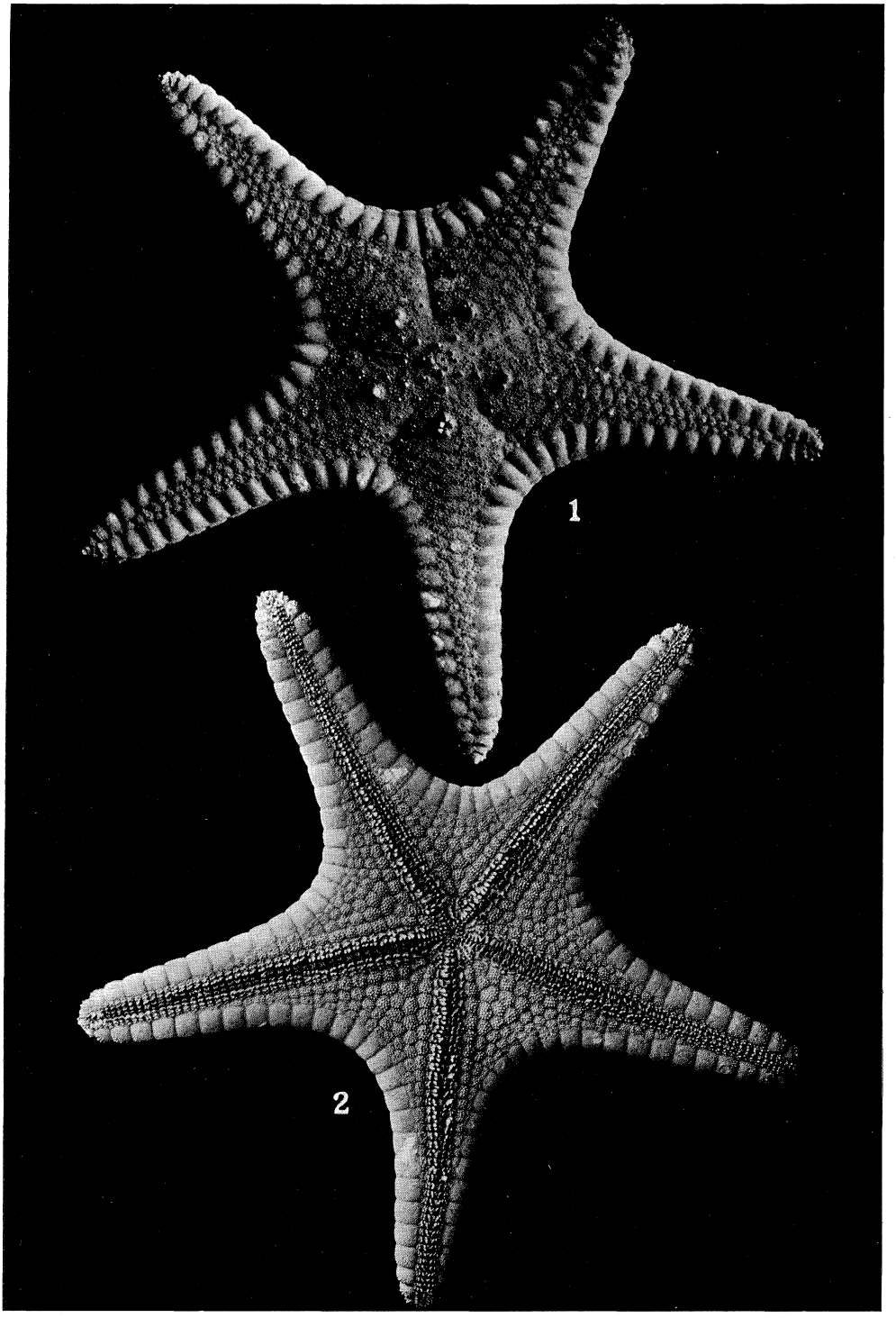
PLATE XIX.

Fig. 1.—*Goniodiscaster integer* sp. nov. Portion of adambulacral armature of holotype. × 4·5.

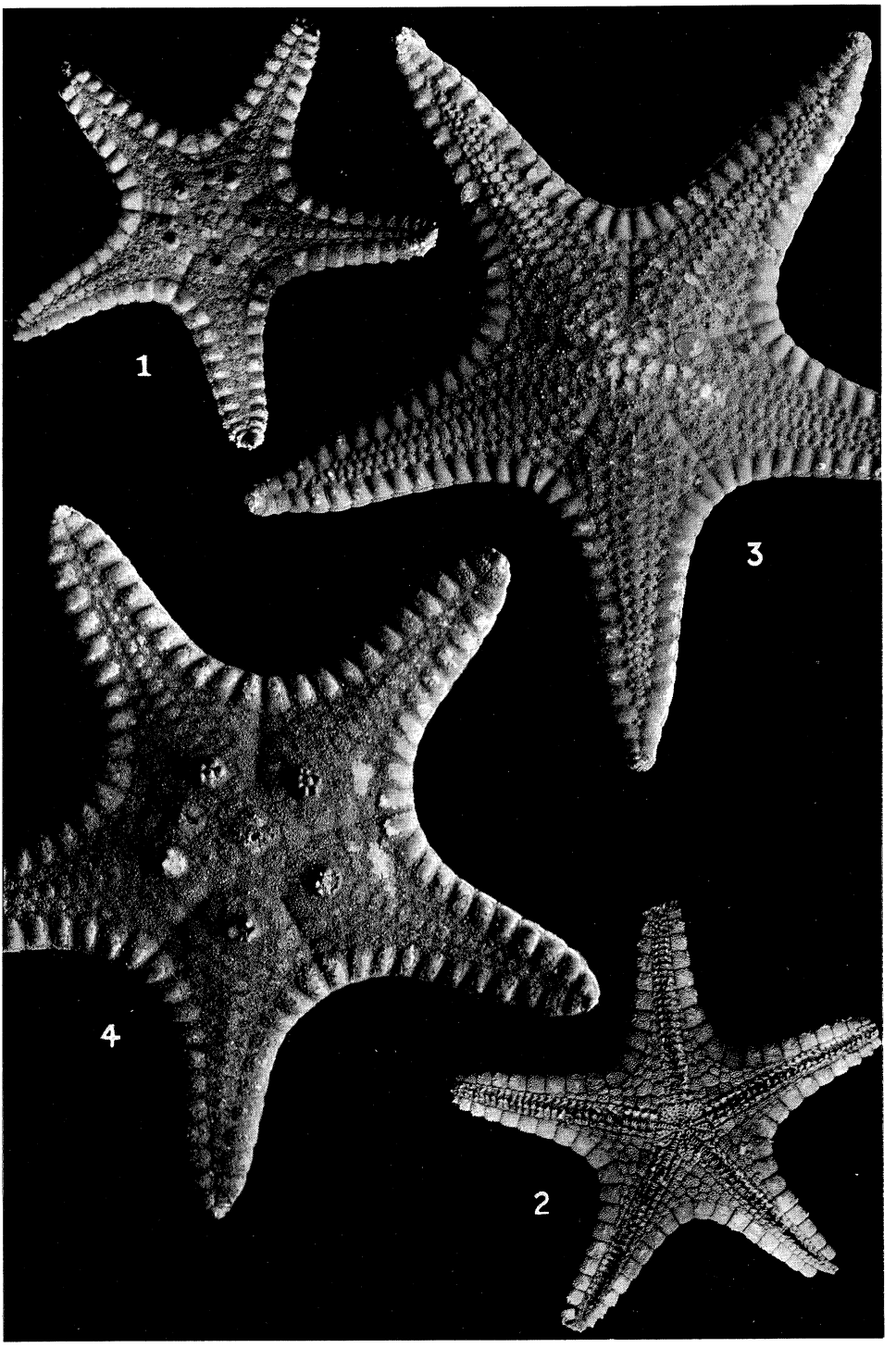
Fig. 2.—*Goniodiscaster integer* sp. nov. Portion of abactinal surface of ray showing granulation and papular areas. Holotype. × 4.

Fig. 3.—*Goniodiscaster pleyadella* (= *Pentagonaster validus* Bell—co-type). Abactinal surface of specimen loaned by the Museum of Comparative Zoology at Harvard, Cambridge, Mass., U.S. America. Approx. natural size.

Fig. 4.—Actinal surface of same specimen. Approx. nat. size.



G. C. CLUTTON, photo.



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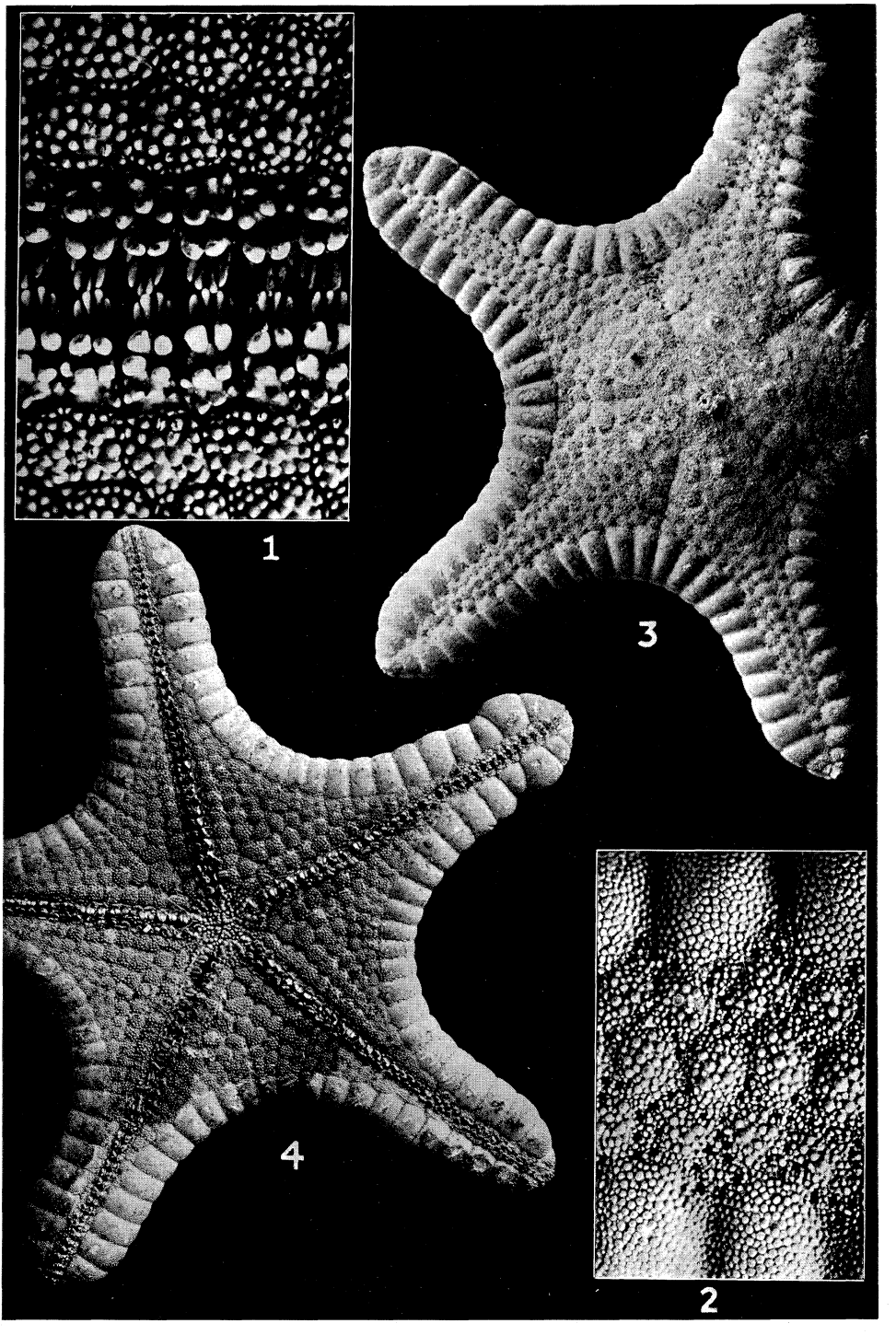

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