

CRITICAL REMARKS ON A. BITTNER'S "ECHINID-
EN DES TERTIARS VON AUSTRALIEN."

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A reference to the above-mentioned paper, published in the Transactions of the "Kaiser-Kong. Akad. der Wissenschaften in Wien," and read before that Society March 10, 1892, is here made partly as a supplement to my communication on the Echinoids of the Australian Eocene in Trans. Roy. Soc. S. Aust., vol. XIV., p. 270, 1891, but more particularly as an illustration of the evil of intrusting diagnostic work (except under very special circumstances) to external authors, who cannot have that thorough knowledge of the mode of occurrence and habits of the objects which is so essential to exactitude in defining the limits of variability of species.

Last year I despatched to Dr. Stur, as Director of the Imperial Museum of Vienna, a large suite of fossils from the Older Tertiary strata of Australia, amongst which were sixteen species of echinoids, fairly well represented individually; this material served as the basis of Mr. Bittner's paper. I exercised the greatest care in the selection of the specimens, being desirous to forward only those of established species; in the case of *Psammechinus Woodsi*, *Paradoxechinus novus*, and *Fibularia gregata* the series was fairly large, so as to embrace, in my opinion, considerable range of individual variation. Of the small number of species sent to the Vienna Museum Mr. Bittner makes five additional species, some new varieties, and establishes three new genera. His communication has, however, despite the forcible effort at species-making, a value by illustrating the extent of individual variation of certain common species, and by defining minute details of structure which may indicate some generic relationships not hitherto recognised; it is, moreover, accompanied by four well-executed plates.

The same author supplies a bibliographic reference which was unknown to me, viz:—*G. Cotteau*, "Mem. Soc. Zool. de France, 1890," wherein are described some new or little-known echinoids, including some species from our Eocene strata. That paper is not yet accessible to me.

The following additional references are noteworthy.

SALENIA TERTIARIA, *Tate*.

Pleurosalenia tertiaria, Pomel, Classification method, p. 94, 1883.

Salenia tertiaria, Bittner, op. cit., t. 1, figs. 6 to 7, p. 333.

PSAMMECHINUS WOODSI, *Laube*.

Id., Bittner, op. cit., t. 1, fig. 1, p. 334; and *var. fasciger*, t. 1, fig. 2, p. 336.

Psammechinus humilior, Bittner, op. cit., t. 1, fig. 3, p. 337.

Laube's species is very variable in shape and in the density of the granular ornamentation, particularly on the interambulacral plates. Bittner's *P. humilior* is a large depressed form, and the most commonly occurring. *P. Woodsi*, *var. fasciger*, Bittner, differs by the slight tumidulosity of the interambulacral areas, but this character is also associated with depressed tests, like those of *P. humilior*, as well as with the conic shapes such as Bittner figures. All these occur in the River Murray Cliffs. The species is represented in the Aldinga Cliffs also by the *humilior*-form which graduates into an extreme state, in which the secondary granulation is almost obliterated. It would be quite possible to select half-a-dozen specimens to which as many distinctive names could be applied.

PARADOXECHINUS NOVUS, *Laube*.

Coptechinus lineatus, Bittner, op. cit., t. 1, fig. 4, p. 338.

Ortholophus lineatus, Duncan.

Coptechinus pulchellus, Bittner, op. cit., t. 1, fig. 5, p. 342.

Paradoxechinus novus, Bittner, op. cit., t. 4, fig. 4, p. 344.

I have always been dubious as to the distinctiveness of *Ortholophus lineatus*, Duncan, from *Paradoxechinus novus*, Laube; but I had reserved an expression of opinion till I had an opportunity of examining an example of Duncan's species collected at the locality of his type. Bittner's interpretation of the characters of *Ortholophus lineatus* leaves, however, no doubt, I think, as to the identity of the two. It is noteworthy that Duncan regards *Coptechinus* as a synonym with *Paradoxechinus*, whilst Bittner makes Duncan's genus *Ortholophus* synonymic with *Coptechinus*, but places *Paradoxechinus* independently. Duncan in his classificatory arrangement of the echinoidal genera removes *Paradoxechinus* far from *Psammechinus*; but my own observations on our Eocene species of the two genera induce me to bring them into very close relationship.

As the result of an examination of many scores of specimens, collected at the same locality and horizon, of what I recognise as *P. novus*, including those obtained from the same place as Laube's type, I find that the test varies from low-depressed to

moderately sub-conical, that the ornamentation of the plates exhibits very great diversity, ranging from a few radial lines of granulations of varying prominence to densely-packed granulations without any conspicuous radial arrangement; Bittner's *Coptechinus pulchellus* is a form between these extremes.

MONOSTYCHIA AUSTRALIS, *Laube*.

Id., Bittner, op. cit., t. 2, figs. 5-8, p. 345.

MONOSTYCHIA ETHERIDGEI, *Johnston*.

Micraster Etheridgei, Johnston, Proc. Roy. Soc. Tasm., 1877, p. 116.

Monostychia Etheridgei, Johnston, Geology of Tasmania.

During a recent visit to Table Cape I collected a single example of a small *Monostychia*, which is without doubt Johnston's species. The original generic reference by Johnston must have been a *lapsus calami*, as the diagnosis of the species imperfectly indicates a *Monostychia*-like fossil, and the subsequent reference as given above may be regarded as a corrected erratum. *M. Etheridgei* differs from *M. australis* by its narrow oblong-oval outline and its low regularly-convex dorsal surface, broadest behind, with blunt incisions, and gradually narrowing to the somewhat-produced shortly-rounded anterior margin; the tumid umbilical margin is very distinctive. Length 18.5, greatest breadth 14.5, thickness 3.75 mm. Specimens from the Murravian beds attain to twice these dimensions.

FIBULARIA GREGATA, *Tate*.

Id., Bittner, op. cit., t. 2, fig. 2, p. 347; *var. orbiculus*, t. 2, fig. 1.

Fibularia Tatei, Bittner, op. cit., t. 2, fig. 3, p. 348.

Mr. Bittner's new species represents an individual state of a profusely-abundant and protean form.

CASSIDULUS LONGIANUS, *Gregory*.

Australanthus longianus, Bittner, op. cit., t. 3, fig. 2, p. 350.

Gregory's species is made the type of a new genus. I am not prepared to discuss the advisability of this step.

CATOPYGUS ELEGANS, *Laube*.

Tristomanthus elegans, Bittner, op. cit., t. 4, fig. 3, p. 352.

Bittner established a new genus for the reception of our fossil, *Nucleolites subcarinatus*, Goldf., and *Echinanthus subhemisphaericus*, Ebert. The Australian species had already been separated from *Catopygus* under the subgeneric title of *Studeria*, and there is no valid reason for its rejection and the substitution of *Tristomanthus*.

PYGORHYNCHUS VASSALI, *Wright*.

Pliolampas Vassali, Pomel, Classification method.

ECHINOLAMPAS POSTEROCRASSUS, *Gregory*.

Progonolampas Novæ-Hollandiæ, Bittner, op. cit., t. 3, fig. 1, p. 357.

The specimens forwarded to Vienna are authentic examples of Gregory's species, which Mr. Bittner seems to find sufficient individual characters in them to make a new species. Whether or not there is good foundation for the creation of a new genus, I have no desire at present to discuss, but I must strongly protest against such reckless species-making.

ECHINOLAMPAS GAMBIERIENSIS, *Ten.-Woods*.

? *Echinolampas Morgani*, Cotteau.

I question very much if there be more than one species of this genus in the River Murray Cliffs, but being unacquainted with Cotteau's diagnosis of his new species, I can only cast a doubt on its validity. My knowledge of *E. Gambieriensis* is very extensive, as the species is common, though the possible occurrence of a second species must be admitted.

HOLASTER AUSTRALIÆ, *Duncan*.

? *Galeraster Australiæ*, Cotteau.

H. Australiæ, Bittner, op. cit., t. 3, fig. 3, p. 359.

H. difficilis, Duncan, regarded by me as a crushed *H. Australiæ*, is erected by Pomel into a new genus with the name *Corystus*.

CARDIASTER TERTIARIUS, *Gregory*.

Id., Bittner, op. cit., p. 360.

MICRASTER ARCHERI, *Ten.-Woods*.

Cyclaster lycoperdon, Bittner, op. cit., t. 4, figs. 1, 2, p. 360.

? *Cyclaster Morgani*, Cotteau.

Of this familiar echinoid of the River Murray Cliffs two examples were sent to Vienna under the name of *Brissopsis Archeri*, Woods; and because Mr. Bittner had no knowledge that the species had been diagnosed he substitutes a new designation.*

Bittner admits that *Micraster brevistella*, Laube, is congeneric with his new species, but I have already shown that Woods' name has priority; as to Cotteau's *Cyclaster Morgani*, there is good reason to believe that it belongs to the same species.

* Unter dem Namen *Brissopsis Archeri*, Woods, welcher meines Wissens nicht publicirt worden ist (*sic*).

Had I been influenced by my own judgment, and not by Duncan's, I should have continued to retain *Hemiaster Archeri*, Ten.-Woods, in *Brissopsis*, to which Duncan refers *Cyclaster* as a synonym. However, the characteristic, incomplete, simple, peripetalous fasciole has already been described by me, and subsequently figured by Bittner; the association therewith of an almost obsolete anterior groove may make it desirable to employ the name of *Cyclaster* for our species in place of *Micraster* or *Brissopsis* as hitherto.

LOVENIA FORBESII, *Ten.-Woods*.

Sarsella Forbesii, Pomel, Classification, p. 28; *id.*, Bittner, op. cit., p. 364.

EUPATAGUS ROTUNDUS, *Duncan*.

Euspatangus rotundus, Bittner, op. cit., p. 365.

EUPATAGUS MURRAYENSIS, *Laube*.

Euspatangus Murrayensis, Bittner, op. cit., p. 365.

HEMIASTER PLANEDECLIVIS, *Gregory*.

Id., Bittner, op. cit., t. 2, fig. 4, p. 366.

GUALTERIA AUSTRALIS, *Cotteau*.

This is an interesting addition to the echinoid-fauna of the Australian Eocene, and is unrepresented in my collection.

