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ADDITIONAL NOTES

ON THE

PALÆONTOLOGY OF QUEENSLAND

(PART 2).

By R. ETHERIDGE, JUNR.,

CURATOR OF THE AUSTRALIAN MUSEUM, SYDNEY.

WITH FOUR PLATES.



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LETTER OF TRANSMITTAL.

TO THE HONOURABLE THE MINISTER FOR MINES.

Geological Survey Office,
Brisbane, 19th March, 1901.

SIR,—

I have the honour to enclose a Paper by Mr. R. Etheridge, Junr., Curator of the Australian Museum, Sydney, entitled "Additional Notes on the Palæontology of Queensland, Part 2," with Four Plates, and to recommend that it be printed in pamphlet form as Bulletin No. 13.

I have, &c.,

WILLIAM H. RANDS,
Government Geologist.

ADDITIONAL NOTES ON THE PALÆONTOLOGY OF QUEENSLAND (PART 2).*

By R. ETHERIDGE, Junr., Curator of the Australian Museum, Sydney.

(WITH FOUR PLATES.)

I.—INTRODUCTION.

For a very long time I have had in my care a portion of the fossils collected in the Queensland Cretaceous area by Mr. G. Sweet, of Brunswick, Melbourne, and others forwarded to me at different times by Messrs. R. L. Jack (formerly Government Geologist) and W. H. Rands (Government Geologist). Pressure of official duties, and, in consequence, lack of spare time, prevented me from investigating these fossils as completely as I could wish until recently.

The following descriptions are either those of the more important species, or of specimens yielding fuller details of species already described by myself and others elsewhere. This paper may, therefore, be regarded as supplementary to the Cretaceous portion of the organic remains described in the "Geology and Palæontology of Queensland, &c.," by Dr. R. L. Jack and myself, published in 1892.

It seems to be the fate of the student of Australian Palæozoic and Mesozoic Palæontology to be always confronted with either more or less fragmentary or ill-preserved material. This, moreover, in the case of any given fauna often reaches him at irregular intervals of time. As a result, his acquaintance with his species is very often acquired little by little, and it not infrequently happens that the first attempt to define a given form is not an unmixed success; such has very often been the fate of the writer.

II.—DESCRIPTION OF THE SPECIES.

SPONGIDA.

Genus Purisiphonia, Bowerbank, 1869.†

(Proc. Zool. Soc., p. 342.)

PURISIPHONIA CLARKEI, Bowerbank.

P. Clarkei, Bowerbank, Proc. Zool. Soc., 1869, p. 342, t. 25, f. 6 and 7.

P. Clarkei, Hinde, Cat. Foss. Sponges Brit. Mus., 1883, p. 124.

P. Clarkei, Hinde, in Jack and Etheridge's Geol. Pal. Q'land, &c., 1892, p. 438, t. 19 (for synonymy).

Obs.—The only other specimens in existence, besides the original ones used by Drs. Bowerbank and Hinde are, I believe, the present

* Part 1 appeared in 1894, in the *Proceedings of the Linnean Society of New South Wales*, 1X. (2), p. 518, and comprised the Palæozoic additions.

† Emended Hinde, 1892.

examples in Mr. Sweet's cabinet. In Dr. Hinde's emended description of this interesting sponge, the form is said to be that "of a hollow stem giving off tubular branches." There is no trace in Mr. Sweet's specimens of any stem-like growth with hollow branches, so well shown in the original figures of Bowerbank and Moore*, but rather that of an oblong, pyriform body. There are, however, the same thick and robust walls and uneven surface, whilst the skeletal mesh and microscopic structure seem to be identical with that figured by Dr. Hinde.

The oscules are circular or elliptical, and there are several excellent examples of the manner in which the canals are formed by the interlacing and bending round of the spicular tissue. I am not, however, quite satisfied that some of the canals do not penetrate the spongy wall, contrary to the view expressed by Dr. Hinde.

One of the specimens, cut in natural longitudinal section, measures two and three-quarter inches in length by one and three-quarter inches in breadth. The walls possess a thickness of nearly half-an-inch, and the central vacuity is seven-eighths of an inch in diameter.

Loc. and Horizon.—Wollumbilla (the type locality)—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

ECHINODERMATA.

Genus Isocrinus, Von Meyer, 1837.†

(Mus. Senkenberg, 1837, p. 251.)

ISOCRINUS AUSTRALIS, Moore, sp.

(Pl. I., fig. 4; Pl. III., figs. 1-3.)

Pentacrinus australis, Moore, Quart. Journ. Geol. Soc., 1870, xxvi., p. 243, t. 17, f. 3; t. 18, f. 1.

Pentacrinus australis, Eth. fil., Cat. Austr. Foss., 1878, p. 105.

Pentacrinus australis, Eth. fil., Geol. and Pal. Q'land, &c., 1892, p. 439, t. 20, f. 1-3.

Sp. Char.—First radials short, exteriorly triangular; second radials also short, their transverse diameters greatly exceeding the longitudinal; third radials the largest, high, and axillary. Rays five, not in lateral contact; arms isotomous, of seventy or more divisions, fourteen or more to a ray; fixed brachials (I Br) small and node-like exteriorly; primibrachs (I Br), or monostichals (1 St) thirteen, the thirteenth primaxil (I ax), or monaxil (1 Ax); secundibrachs (II Br), or distichals (2 St) fifteen, the fifteenth secundaxil (II ax), or distaxil (2 Ax); tertiobrachs (III Br) and tetrastichals (3 St) present. First primibrachs (I Br₁), or first monostichals, (1 St₁) widely V-shaped along their ventral edges. Columnals with petaloid sectors.

* Quart. Journ. Geol. Soc., 1870, xxvi., t. 17, f. 1.

† Redefined Bather, 1898.

Obs.—Specimens of this Crinoid collected by Mr. Sweet enable me to give a more extended description than that afforded by Mr. Moore, but the imperfection of the fossils still leaves much to be desired.

I have endeavoured to adopt Mr. F. A. Bather's terminology* as far as I possibly can, but this very imperfection and consequent doubt as to some of the structural points has rendered this attempt far from satisfactory. In nothing is this more apparent than in the terminology of the arms or brachia, in consequence of doubt as to the presence of pinnules on some of them, rendering the use of different terms necessary. For reasons to be subsequently given I have employed the double terminology suggested by Mr. Bather in his paper† just quoted.

In the first place the question of genus arises, but a solution of this is rendered comparatively easy by Mr. Bather's masterly article on the use and misuse of the name *Pentacrinus*.‡ *Isocrinus* is adopted for reasons to be given later.

From the appearance of Mr. Sweet's principal specimen, and the figures formerly published by Mr. Moore, I think there can be little doubt that *I. australis* possessed five rays. The specimen in question exhibits portions of this number, more or less attached to the dorsal cup, comprising seven out of the ten arms into which the rays divided, presuming the development to have been normal.

The first of Moore's figures§ is seen from the dorsal side, and consists of a columnal, the five isolated node-like fixed brachials (I Br), four of the first radials, the second and third radials of two rays, and the second in a fourth ray; the third radials are axillary. There are thirteen, fifteen, and fifteen primibrachs (I Br) respectively shown on three of the imperfect arms.

The second figure|| represents *I. australis* seen from the interior of the dorsal cup, with portions of two rays attached to the latter. Separated by intervening matrix are other arm portions seen from the ventral side, arising in pairs from axillaries, and others represented by clusters of pinnules; the arms or brachia are therefore compound. Above the paired arm portions lie transversely two further series of pinnule-bearing ossicles that may be finials (F).

Mr. Sweet's principal specimen consists of a dorsal cup severed in half, and the dorsal portion removed, exposing the five first radials, and portions of five rays. The first radials meet one another at their ventral lateral margins round the dorsal cup, and form a partially complete ring. As I cannot satisfactorily orient this specimen, I purpose describing the rays one by one, from left to right as it lies before me. In the fractured section three of the fixed brachials (I Br) are visible, each wedged between the dorsal ends of two of

* Ann. Mag. Nat. Hist., 1892, ix. (6), p. 51.

† Loc. cit., p. 60, par. 2.

‡ Natural Science, 1898, xii., No. 74, p. 245.

§ Moore's t. 17, f. 3. As there are no pinnules shown I use the Latin terminology in describing this and following figure.

|| Moore's t. 18, f. 1.

the first radials, and projecting externally as small nobs or nodes. Of the first ray on the left of the specimen, only a few primibrachs (I Br) of one arm (α) remain, and need not be further referred to. The next ray is rather more perfect, retaining a few primibrachs of the left arm (β), and eleven ossicles or brachialia of the right (γ), with gaps from which two other pieces have fallen, or thirteen ossicles in all, the thirteenth being primaxil (I ax); the bifurcation is followed by four and seven secundibrachs (II Br) respectively. The succeeding ray is even more complete, and, like the preceding one, is definitely attached to the dorsal cup. In the left hand arm (δ) are twelve primibrachs (I Br), and a gap left by one that has disappeared, thus again rendering the thirteenth primaxil (I ax); the bifurcation is followed by five and two secundibrachs (II Br) respectively, and thence the remainder are missing. In the right arm (ϵ) of this ray, eleven primibrachs are preserved, and two vacuities are apparent, the terminal ossicle being axillary (I ax). The secundibrachs are represented by fifteen and three ossicles, left and right respectively, the fifteenth ossicle of the former being secundaxil (II ax) and supporting three tertioibrachs (III Br), of one arm. In the fourth ray the third radial is followed on the left arm (θ) by four monostichals (1 St), and on the right arm (i) by three, then occurs a wide gap caused by fracture of the rock, from which all the ossicles have disappeared, but the arms (θ and i) are again renewed at the monaxils (1 Ax), the distichals (2 St) of the left branch of θ being thirteen, whilst in the right eight only remain, the thirteenth of the former being distaxil (2 Ax); the latter affords support to five and twelve tetrastichals (3 St.) respectively. Of the distichals (2 St.) just mentioned, the first (2 St₁), fourth (2 St₄), sixth (2 St₆), eighth (2 St₈), and tenth (2 St₁₀), retain portions of pinnules attached, and so with the first tetrastichal (3 St₁), and the third (3 St₃). At the twelfth tetrastichal (3 St₁₂) of the right branch is a cluster of pinnules, and beyond other detached ossicles, apparently of this same series, which would seem to indicate that the tetrastichals were very numerous, unless there be a tetraxil (3 Ax) hidden in the cluster of pinnules before mentioned. In the right-hand arm (i) of this fourth ray there are fourteen distichals (2 St.) preserved, and a cavity left by the disappearance of 2 St₂, thus again rendering the fifteenth distaxil (2 Ax). Beyond this, the tetrastichals (3 St.) on the left are indistinctly preserved, but on the right there are ten. Of the fifth ray, the ossicles are much displayed, and do not afford details for satisfactory description.

It becomes apparent that in the proximal portions of the arms, whether the ossicles be primibrachs or monostichals, the thirteenth is always the primaxil (I ax) or monaxil (1 Ax) as the case may be, and that in the next divisions, whether secundibrachs (II Br) or distichals (2 St), the fifteenth ossicle forms the secundaxil (II ax) or distaxil (2 Ax) as the case may be.

The presence of pinnules on the arms of one ray, and not on those of another has caused me to use the double terminology in describing the arm divisions. I take it this is the meaning of the following passage in Mr. Bather's previously quoted suggestive paper—"In cases where some only of the free brachial series bear pinnules,

it would be well to apply the Latin terminology to those brachials without pinnules, whether free or fixed, and the Greek to those with pinnules.”*

The first primibrach (I Br₁) or first monostichal (1 St₁) are widely V-shaped along their ventral edges, and the dorsal edges of I Br₂ and 1 St₂ are correspondingly so.

Mr. Sweet's second specimen I take to be the long terminal portions of three arms, two united by an axil, but the third separate. In the former case there are fifty-four small ossicles in one branch and thirty in the other, both series being clearly incomplete; below the axil are indications of four ossicles. In the third instance there are about twenty ossicles above an axil, and below the latter eight. There is no trace of pinnules on either of the branches. If these are the actual terminal portions of arms they must be known as finials (F). What the ossicles below the axils are, whether secundibrachs (II Br), or tertibrachs (III Br), it is of course impossible to say with certainty, but from the smaller size of the ossicles below the axils, as compared with those of the tertiary series in the larger specimen, they may be quartibrachs (IV Br). The long series of ossicles above would then become quintibrachs (V Br), or finials (F).

Consideration of the measurements of these various parts leads to the belief that Moore's estimate of the length of an arm, six inches, is much too little. It was certainly eight inches, but as none of the arms are absolutely complete, a still further extension must, I think, be allowed for. Each arm in *I. australis* is divided at *least seven* times, or fourteen divisions to the ray, giving for the five arms, a total of seventy divisions, presuming all to have been normally developed; probably there were more.

As in some Pentacrinidæ, and most Comatulæ, the second plates above the first radials are axillary, and in common with the intermediate plates are of the same width as the first radials.

It is curious that throughout the matrix of both Mr. Sweet's specimens, columnals are conspicuous by their absence. Such was also the case with Moore's, although he says that “in a block from Wollumbilla, a portion of a column, with ninety-five regular joints is present of probably the same species”—*i.e.* of *I. australis*. One of his figures exhibits the base of the calyx, “with its columnar articulation.” The facet here displayed has unmistakable petaloid sectors.

The late Sir F. McCoy also, many years ago, when reporting on a collection of fossils from Wollumbilla for the late Rev. W. B. Clarke, recognised the columnals of a Pentacrinid amongst the specimens. He said,† “*Pentacrinus* of the true type having the petaloid arrangement of the articulating ridges, distinguishing the Mesozoic and Cainozoic Pentacrinites from the pentagonal crinoid stems of the Palæozoic periods.”

As to the genus, Mr. Bather has shown that *Pentacrinus sensu strictu*, possesses linear sectors on the columnal articular facets;

* Ann. Mag. Nat. Hist., 1892, ix. (6), p. 60.

† Trans. R. Soc. Vict., 1865, vi., p. 44; Clarke's Recent Geol. Obs. in Australasia, 1861, p. 50.

infra-basals present in the adult condition; radials prolonged downwards over the proximal columnals, and cirri elliptical or compressed.* On the other hand he defines *Isocrinus* as with broad petaloid sectors on the columnal joints; radials not prolonged downwards; arms isotomous; two brachials below the first forking in a ray, and these without pinnules; and the cirri transversely elliptical or circular. So far as the characters of the present specimens can be made out, they accord better with the latter than the former, and on these grounds I have referred them to *Isocrinus*.

Loc. and Horizon.—Maranoa River—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

ANNELIDA.

Genus *Serpula*, *Linnaeus*, 1753.

(*Systema Nat.*, Ed. 10, p. 786.)

SERPULA TRACHINUS, *Goldfuss*?

(Pl. IV., figs. 5 and 6.)

S. trachinus, *Goldfuss*, *Petrefacta Germaniæ*, Zweite Aufl., 1862, Thiel 1, p. 219, Atlas t. 70, f. 1.

Sp. Char.—Tube long, smooth, convex on the sides, attenuated, slightly carinate and uncinat posteriorly, sometimes irregularly curved, never coiled spirally or in the same plane, or completely returned on itself, the slight posterior carina fading off anteriorly into an almost imperceptible obtuse angularity; no regular varices, but an occasional obtuse ring-like swelling of the test.

Obs.—I am unable to distinguish any points of difference between the Queensland fossils and that figured by *Goldfuss* as a Cretaceous species, except that the former are slightly less carinate posteriorly. None of the specimens show any sign of attachment, but are all lying free in the matrix—a dark blue impure limestone.

In advance of the posterior carina the middle line of the tube is in nearly every case depressed, as if a line of weakness existed, but not partaking of the nature of a groove.

The shell structure is preserved, and is similar to that of other Tubicolar Annelids, consisting of an inner minutely vesicular layer, a middle dense laminated layer, and an outer laminated and tubular layer.

Similar tubes from the Quader of Saxony known as *Serpula amphibæna*, *Goldfuss*, common also to the Cretaceous of Britain, have been referred by Dr. A. E. von Reuss to the molluscan genus *Gastrochæna*,† and had it not been for the test structure of the present specimens I should have hesitated in the course now adopted with the latter. Some doubt still lingers in my mind from the fact that the Queensland examples are, unlike most *Serpulæ*, all free, unagglomerated, and unattached; nor, on the other hand, is there any evidence

* Lancaster's Treatise, Pt. iii., Echin., 1900, p. 182.

† Palæontographica, xx., Theil 2, Lief. 6, p. 235, t. 52, f. 8-12.

remaining of the cyst-like proximal termination of the shelly tube as in *Gastrochæna*. Under these circumstances, and pending the acquisition of additional facts, the specimens are catalogued as above.

Loc. and Horizon.—Maranoa River and Wollumbilla—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

CRUSTACEA.

Only two crustaceans are known from the Australian Cretaceous with any certainty, although Mr. Charles Moore referred to certain obscure organisms from the Wollumbilla beds, that were, perhaps, the remains of Cirripedes.* The first of those referred to above is *Prosopton Etheridgei*, H. Woodward,† a Brachyurous Decapod, allied to species from the Neocomian rocks of the Department Jura, France. The nature of the matrix induces me to believe that the specimen came from the Central Queensland Cretaceous area.

The second specimen was referred to by myself in a short note accompanying Dr. Woodward's paper.‡ It is a portion of one of the large chelæ of a Macrurous Decapod, and it is preserved in a blue-grey concretionary limestone, much resembling that of the Walsh River District, and therefore from the same division of the Queensland Cretaceous as *P. Etheridgei*. It is impossible to name this specimen, but it may be compared to the corresponding part in *Palæastacus*, —e.g., *P. Edwardsi*, Etallon,§ and *P. solitarius*, Oppell,||—or *Eryma*, *Callinassa*, or *Schluteria*, —e.g., *S. tetracheles*, Fr.|| The specimen consists of the sixth joint or propodos, with the apical prolongation broken off, a portion of the dactylos, the carpos, and part of the meros.

Collection.—Queensland Museum.

POLYZOA.

Genus Lunulites, *Lamarck*, 1816.

(Hist. Nat. Anim. sans Vertèb., 1816, ii., p. 194.)

LUNULITES ABNORMALIS, *sp. nov.*

(Pl. IV., figs. 7 and 8.)

Sp. Char.—Zooarium circular, sub-cupuliform or inclined to infundibuliform, with a flattened or somewhat everted peripheral area. Zoecia oblong, averaging half a millimetre in length. On the reverse the diverging rays or ribs, corresponding to the lines of zoecia, are rounded, separated by impressed and distinct furrows, and the rays pierced by unequally distributed punctures, perhaps indicating the presence of anchoring processes, or stolons, now removed.

Obs.—The testiferous portions have almost entirely disappeared, leaving the organism represented by internal casts of the obverse and decorticated surfaces of the reverse. The casts of the zoecia on the

* Quart. Journ. Geol. Soc., 1870, xxvi., p. 243.

† Proc. Linn. Soc. N. S. Wales, 1892, vii. (2), p. 301, t. 4.

‡ *Ibid.*, p. 305.

§ Oppell, Pal. Mittheil. Mus. K. Bayer Staates, t. 11, f. 3a and b.

|| Fritsch and Kafka, Crust. Böhm. Kreideform, 1887, t. 6.

obverse are oblong and follow one another in regular serial order. They are augmented by the interpolation of new lines of zoëcia between two pre-existing ones. The reverse is seen under three conditions—(1) Either as a series of sub-parallel, or slightly radiating continuous grooves, from which the whole of the zoëcia casts have been removed; (2) or, when seen from their outer side, as riblets, devoid of testaceous material, and punctate, as above described; (3) or, with traces here and there of the test remaining and supporting irregularly distributed wart-like papillæ, possibly the bases of anchoring stolons.

The zoarium, although circular, is not strictly cupuliform, but on the obverse or zoëcious face the margin is bent outwards, forming a flattened peripheral area. It further differs from that of *Lunulites* in that the obverse face bearing the zoëcia is the more or less concave aspect instead of being the convex as in the genus named. Again the *Lunulites* in the mature state are free, but fixed in youth; if, therefore, the perforations or wart-like papillæ indicate the former presence of anchoring filaments we see a further departure from the structure of *Lunulites*, for the present specimens certainly seem to be mature. The reference to *Lunulites* can only be regarded as provisional.

Loc. and Horizon.—Bungworgorai Creek, near Mount Abundance.—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

BRACHIOPODA.

Genus Lingula, *Bruguère*, 1791.

(Encycl. Method., i., pl. 250.)

LINGULA SUBOVALIS, *Davidson*.

L. subovalis, Dav., Mon. Brit. Foss. Brach., i. Pt. 2, Cretaceous, No. 1, 1852, p. 7, t. 1, f. 29-30.

L. ovalis, Moore (*non* Sby.), Quart. Journ. Geol. Soc., 1870, xxvi., pp. 236 and 240.

L. ovalis, Eth. fil., Geol. Pal. Q'Land., &c., 1892, p., 444, t. 20, f. 14.

L. subovalis, Tate, Proc. Austr. Assoc. Adv. Sci. for 1888 (1889), i. p. 230.

Obs.—In reviewing the Queensland Mesozoic Brachiopoda, Mr. Moore remarked:—"The only species to be recognised (in the Wollumbilla blocks) is the *Lingula ovalis* of the Kimmeridge Clay, or the *L. subovalis* of the Lower Greensand, which names probably refer to the same species." In his list he afterwards speaks of it as *L. ovalis*, and under this name I subsequently quoted it. Professor Ralph Tate, however, has suggested that the species is really the *L. subovalis* of the L. Greensand, and I now think he is correct, although no interiors have been examined so as to place the question beyond doubt.

The form is that of *L. subovalis*, but the sculpture, consisting of microscopic close concentric threads, resembles that of *L. ovalis*.

Loc. and Horizon.—Wollumbilla—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

PELECYPODA.

*Genus Pecten, Müller, 1776.**

(Zool. Danicæ Prod., p. 248.)

PECTEN SOCIALES, *Moore.**P. socialis*, Moore, Quart. Journ. Geol. Soc., 1870, xxvi., p. 248, t. 11, f. 10.? *P. psila*, Ten. Woods, Proc. Linn. Soc. N. S. Wales, 1888, viii., p. 239.*P. socialis*, Eth. fil., Geol. Pal. Q'land, &c., 1892, p. 446, t. 21, f. 6, 7, and 9.*P. sp. ind.*, Eth. fil., *Ibid*, t. 21, f. 5.*P. æquilineatus*, Eth. fil., *Ibid*, t. 21, f. 8 (*non* p. 445).

Sp. Char.—Shell small, suborbicular, moderately convex, both valves practically alike; dorsal margin less than the width of the shell, shortest on the anterior side. Umbones very small, but pointed. Posterior auricles small, triangular, flattened, outer margin straight or slightly obliquely truncated; anterior auricles larger, elongately triangular, the outer margin obliquely rounded in the right valve, with a slight byssal sinus beneath, straight and truncate in the left valve. Sculpture on the body of the valves consists of a few concentric laminæ, particularly on the umbonal regions, but at times extending down the valves for a variable distance, with rounded, slightly irregular, curved or divaricating faint costæ that occasionally bifurcate; the anterior ears appear to bear two or three radii. Maximum size, about one inch long.

Obs.—This is essentially a very variable shell, and hence difficult of determination. Moore's figure, that of a left valve, is a decorticated example, and represents the condition in which it is often met with.

In the "Geology and Palæontology of Queensland, &c.," I referred to the late Rev. Mr. Tenison Wood's suggestion that his *Pecten psila* might be the young of Moore's *P. socialis*, and to the adoption of this view by Professor R. Tate,† with the following remark:—"But if the ears of Wood's species are, as he describes them, radiately ribbed, the two shells cannot be identical." At the time this was written I was ignorant of the whereabouts of Wood's type, but have since had the advantage of studying it. It is a piece of mudstone with a few miserably preserved examples of a very small *Pecten*, but the anterior ears certainly do bear two or three radii. I have now seen similar costæ on the anterior ears of *P. socialis*, and I can come to no other conclusion than that the two forms are identical, allowing for the poor condition of Wood's types. I am the more inclined to this view because the latter exhibit faintly, under the lens, the same fine divaricating striæ as on most examples of *P. socialis*, a point that seems to have escaped Wood's notice.

Moore figured a worn left valve. In my former work I gave several figures referred with hesitation to both *P. socialis*, *P. psila*, and *P. æquilineatus*, but after an examination of a number of examples from

* Emended Lamarck, 1799.

† Geol. and Pal. Q'land, &c., 1892, p. 446.

Mr. Sweet's cabinet and a re-examination of Dr. R. L. Jack's original specimens, I have arrived at the conclusion that they must be all placed under *P. socialis* as individuals of one variable species.

In the youngest state there is no sculpture apparent.* In Fig. 7 of the work quoted below both the radiate and concentric ornament is visible through the shell; whilst in Fig. 9 the radiate alone is seen. The concentric rugation more or less disappears with age.

The presence and strength of the costæ entirely depend on the state of preservation. In examples retaining the outer shelly layer the costæ appear as somewhat divaricating depressed riblets, bifurcating now and then near the margins, and separated by valleys of less width than the riblets. On the other hand, decorticated specimens only show fine micro-costæ of a similar nature, but when exfoliation of the shelly layers has been carried still further, the surface exhibits only a streaky appearance, from a breaking up of the component laminæ.

The concentric rugæ are very variable in number, but always regular, and disappear more or less with age. They are sometimes confined to the umbonal region only, at others extending downwards for half the length of the valves, and in extreme cases for two-thirds.†

P. socialis is not a true *Pecten* in the restricted sense of the genus. The outline and character of the auricles point to *Pseudamusium*, Klein, or *Synsyclonema*, Meek, which Stoliczka‡ and Dall§ consider to be synonymous with one another; whilst Verrill|| on the other hand, retains them as separate genera. I am inclined to place this little shell in *Synsyclonema*, Meek¶. The condition of the costæ reminds us of *Camptonectes*, Ag., but there is no trace of the intercostal pitting, or "camptonectes sculpture."

The Rev. Mr. Tenison Woods, speaking of *Pecten psila*, says: "The fossil I have described might well be a young state of Mr. Moore's fossil. It is much smaller; the average dimension from hinge to margin is about 6 millimetres, with a transverse diameter of 5. It is found abundantly scattered over some fragments** of olive greenish marl, looking not unlike *Nummulites*. As I have only seen the figures and descriptions of *P. socialis*, and as the details are very imperfect, I think it better not to make too hasty an identification, but point out the resemblance for future inquiry."††

Loc. and Horizon.—Mitchell, Maranoa River, and Wollumbilla—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

* Geol. and Pal. Q'land, &c., 1892, t. 21, f 5.

† In my former description I described the anterior ears as smaller than the posterior, but the opposite should have been the case.

‡ Pal. Indica—Cretaceous Fauna, S. India, 1871, iii., Pts. 9-13, p. 426.

§ Bull. Mus. Comp. Zoology Harvard, 1885-6, xii., No. 5, p. 219.

|| Trans. Connecticut Acad. Sci. Arts, 1899, x., Pt. 1, pp. 60 and 62.

¶ Smithsonian Miscel. Collections, 1864, xii., No. 177, p. 31.

** Only one piece has come under my notice.

†† Proc. Linn. Soc. N. S. Wales, 1883, viii., Pt. 2, p. 240.

Genus Maccoyella, Eth. fil., 1892.

(Geol. Pal. Q'land, &c., 1892, p. 451.)

Obs.—This genus was proposed and described in 1892 to receive certain Australian Cretaceous bivalves, variously termed *Avicula* by Moore and *Monotis* by McCoy and Tate, but possessing no characters of importance in common with either. The number of species referable to *Maccoyella* is at present doubtful, but there are certainly three well established forms, in all probability an equally stable fourth, and several other fossils that it will be very difficult to place elsewhere, if not in this genus.

It is not my intention on this occasion to recapitulate the general characters of *Maccoyella*, but to confine my remarks simply to the hinge structure. The kindness of several acquaintances during the past few years, notably Dr. R. L. Jack, Mr. G. Sweet, Prof. R. Tate, and Prof. T. W. E. David, by the loan of specimens, has enabled me to restudy the morphology of this highly interesting genus, and so in some instances to modify my former views, and in others to amplify them.

The cardinal area in the united valves is equal to about two-thirds the breadth of the latter, and is nearly always shorter on the anterior than the posterior side. It will be most advantageous to describe the hinge mechanism of the left or convex valve first. Beneath the slightly overhanging umbo, the area is continued across the umbonal cavity as a rather wide shelly ledge. The chondrophore, which occupies a very considerable proportion of this shelly ledge is divisible into two very unequal portions. Immediately posterior to the apex of the umbo is an obliquely elongate pyriform concavity, extending the whole width of the area, the anterior boundary of this portion of the chondrophore forming a prominent ridge or fold, also extending completely across the area diagonally to the umbo. Anterior to this pyriform scar and fold, and extending transversely across the upper part of the area is the second portion of the chondrophore, which is divided off from the scobinate lamellæ of the anterior end by a groove more or less deeply impressed, according to the species; for the sake of distinction in specific description these halves may be spoken of as the pyriform and transverse chondrophores respectively. Posterior to the former the area is continued as a narrow, linear, inwardly-bevelled margin to its junction with the rounded margin of the posterior end. Both portions of the chondrophore and the posterior area bear fine ligamental grooves, concentric in the pyriform scar, and parallel to the longer diameter in the transverse; anteriorly they are continuous with, and merge into the scobinate lamellæ. Beneath the posterior end of the transverse chondrophore, and alongside the anterior boundary of the pyriform scar, is a shoehorn-shaped socket, deep or shallow according to species, with its anterior ventral angle protruding as a strong, shelly projection, the homologue of a cardinal tooth, and beyond this still in an anterior direction, the shelly edge retires upwards, leaving a well-marked socket-concavity. Beneath the transverse shelly ledge of the area supporting this mechanism, and in the umbonal cavity is a more or less deep hepatic fossa.

In the right or flattened valve, the area is straight on the posterior side, and obliquely inclined to the very insignificant umbo anteriorly, but, as in the left valve, is thickened centrally, and obliquely bevelled inwardly as a whole. Immediately interior and slightly anterior to this umbo the area is inflected or folded on itself to form a very conspicuous plug or button (chondrophoral button), leaving beneath it, on its anterior side, a deep, narrow, and obliquely directed byssal sinus; from this point to the termination of the valve on the anterior side the hinge margin is sharp and unbevelled. On the posterior side of the chondrophoral button occurs a spoon-shaped or pyriform chondrophore, like and similarly marked, and opposite to that of the left valve; thence to the end of the valve the area is linear, and resembles that of the latter. The upper and outer portion of the chondrophoral button is somewhat flattened, and bears resilium furrows; inwardly these disappear, and its surface becomes hollowed or concave, the concavity narrowing inwards, and in fact forming a socket, as will be explained later on. The sides of this button project inwards as two obtusely pointed dental processes, homologous with teeth of other shells, for they perform precisely the same function. The anterior of the two is at the inward termination of the byssal sinus, the posterior forms a ridge between the button proper and the chondrophore, and at times is extended obliquely into a kind of ossiculum, beneath which is a transversely elongated hepatic fossa.

The adaption of these several parts of the two valves to one another is as follows:—The cardinal tooth-homologue of the left valve fits into the socket of the chondrophoral button, whilst the posterior dental process of the right valve drops into the shoehorn-shaped socket of the left valve. The anterior dental process of the chondrophoral button adjusts itself to the anterior concavity of the area of the left valve. By this means a lateral locking of the valves takes place, for to all intents and purposes these prominences and depressions of the hinge act the part of teeth and sockets and assist in retaining the valves in apposition.

The main portion of the resilium occupying the gap between the two pyriform scars was large and powerful, and so was that between the transverse scar of the left valve and the outer portion of the chondrophoral button, but the resilium lying between the inwardly bevelled posterior areas was of much less importance.

The depression, or pit I have termed the hepatic fossa, is present in all the species of which I have seen the interior, both right and left valves, and varies only in size and depth.

MACCOYELLA UMBONALIS, Moore, sp.

Avicula umbonalis, Moore, Quart. Journ. Geol. Soc., 1870, xxvi., p. 246, t. 12, f. 2 and 3.

Maccoyella umbonalis, Eth. fil., Geol. and Pal. Q'land, &c., 1892, p. 458, t. 22, f. 6 and 7, t. 23, f. 4.

Obs.—I have already stated all I know of this shell, or what I suppose to represent Moore's species. His description was meagre, and figures unsatisfactory for purposes of identification. The description already given may be advantageously emended by stating that the

umbo of the left valve is "produced," instead of "much produced"; and the anterior dorsal margin "crenulated," instead of "much crenulated."

M. umbonalis is one of the least satisfactory species of the genus, but as I have had before me at various times large shells that cannot be satisfactorily referred to either *M. Barklyi* or *M. reflecta*, I have provisionally included them in *M. umbonalis*, covered by the description already mentioned. Such specimens do not show so sub-lobate a posterior wing on the left valve as in *M. reflecta*, and the large umbo of the same valve is practically central. The cartilage area of the right valve, admirably shown in a specimen of Mr. Sweet's from Bungeworgorai Creek, is deeper and more massive than in either of the two species named. This particular valve measures five and a-half inches in height by six inches in breadth; in all probability *M. umbonalis* is the largest species of the genus.

The cardinal area in *M. umbonalis* is deep in both valves, and equal in length on both sides of the umbones. The umbo of the left valve rather overhangs its cardinal area, and the anterior cardinal tooth is massive. The shoehorn-shaped socket is wide, and the pyriform chondrophore deep and long. In the right valve the hinge mechanism is strongly developed, the dental processes of the chondrophoral plug being large, and the ossiculum of the posterior strong and pronounced. The socket for the reception of the anterior cardinal tooth of the left valve is wide, and the pyriform chondrophore deep and long. The byssal sinus is also well marked, but the chondrophore itself is not so prominent as in *M. Barklyi* or *M. reflecta*.

The adductor impression of full grown specimens is nearly round and subcentral, with a raised rim, particularly on its posterior side, and is about the size of a half-crown piece of money.

The row of muscle attachment pits uniting the hepatic fossæ with the adductor impression are absent in the right valve of this species. The hepatic fossa itself is shallow.

The costæ are much more uniform in size than in either *M. Barklyi* or *M. reflecta*, and seem to be confined to primary and secondary.

Loc. and Horizon.—Bungeworgorai Creek, near Mount Abundance—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

MACCOYELLA CORBIENSIS, *Moore, sp.*

Avicula corbiensis, Moore, Quart. Journ. Geol. Soc., 1870, xxvi., p. 246, t. 11, f. 7.

Crenatula gibbosa, Eth., *Ibid.* 1872, xxviii., p. 339, t. 19, f. 3.

Avicula Barklyi, Ten. Woods, Proc. Linn. Soc. N. S. Wales, 1883, viii, Pt. 2, p. 240, t. 12, f. 6 (excl. f. 4 and 5).

Maccoyella corbiensis, Eth. fil., Geol. and Pal. Q'land, &c., 1892, p. 458, t. 22, f. 8 and 9.

Sp. Char.—Shell longitudinally ovate, longer than wide, somewhat deltoid and produced postero-ventrally. *Left valve* very convex, the

posterior cardinal area straight and narrow, with numerous fine resilium furrows; anterior cardinal tooth large proportionately, extending beyond the lower edge of the cardinal area; pyriform chondrophore transversely elongate but not deep, its fold often obsolete, and the shoehorn-shaped socket ill-defined or absent; umbo incurved, the apex acute and slightly recurved towards the anterior, with a deep, hollow and pronounced umbonal cavity; anterior margin of the valve oblique above and rounded medianally and below; scobinate foldings numerous but not strongly marked. Posterior end produced ventrally, semi-truncate, with a short, small, slightly convex and emarginate wing, sharply defined from the body of the shell. Ventral margin broadly rounded. Adductor impression subcentral and subcircular, concentrically ridged; pallial impression defined by a series of interrupted and impressed fibre scars. *Right valve* more or less concave; anterior and ventral margins rounded; posterior end slightly alate and rather produced postero-ventrally; umbo insignificant; chondrophoral button large, prominent, and triangular; byssal sinus narrow and channel-like. Sculpture of the left valve consisting of from eighteen to twenty simple radiating primary costæ, alternating with a similar number of finer secondary costæ, that barely reach the umbo, crossed by fine concentric frills, which echinate the costæ but do not rise into spines; the wing is apparently devoid of radii; there are in addition from three to five very conspicuous laminæ of growth on this valve. In the right valve the costæ are numerous, but less strongly developed than those on the left, the secondaries extending but a comparatively short distance up the valve.

Obs.—At the time my former description of this species was written, I had not had the advantage of examining anything like perfect specimens, and in consequence some of the characters then given^a require modification in the face of more perfect material since acquired. I have now seen the right valve in two New South Wales specimens, and although in both cases more or less crushed into the hollow of the left, it is still quite clear that this valve possessed some degree of concavity when in the natural state, and was neither flat nor convex.

The dorsal margin of the left valve is not arched in the typical form of the species, but straight; the arched condition mentioned in my former description arising from the use of much weathered examples in which the wings had been removed. This point should be carefully noted, for I find such a condition of the left valve a by no means uncommon one.

I am now convinced that the impression of a left valve from Maryborough, tentatively figured by me as *M. corbiensis*,* is so, and we must, therefore, accept this as another species occurring in both divisions of our Cretaceous Series.

Again, it is quite clear that one of the shells figured by the Rev. Mr. Tenison Woods as *M. Barklyi*, from the Grey Ranges, N.W. New South Wales, must be referred to *M. corbiensis*; neither will it

* Geol. Pal. Q'land, &c., 1892, p. 459, t. 22, f. 9.

surprise me to find that the shell figured by Moore as *Pecten fimbriatus*, from Wollumbilla, is nothing more than a left valve of this species minus the wing, &c. It is the type of my *Pecten Moorei*.

Loc. and Horizon.—Bungeworgorai Creek, near Mount Abundance—Rolling Downs Formation (Lower Cretaceous); Corporation Quarry, Maryborough—Desert Sandstone (Upper Cretaceous).

Collection.—Sweet.

MACCOYELLA SUBSTRIATA, *Moore*, sp.

(Pl. III., fig. 5; Pl. IV., fig. 4.)

Avicula substriata, Moore, Quart. Journ. Geol. Soc., 1870, xvi., p. 247, t. 11, f. 6.

Maccoyella? substriata, Eth. fil., Geol. Pal. Q'land, &c. 1892, p. 459, t. 22, f. 10 (*non* t. 23, f. 8 and 9).

Maccoyella? subangularis, Eth. fil., *Ibid.*, p. 460.

Obs.—I still believe I am correct in referring a specimen in Mr. Sweet's collection from Bungeworgorai Creek to this species, notwithstanding that it is much larger than that represented in Moore's figure; the fossil in question measures one inch long by one and a-quarter inches in width.

A cast from Maryborough cannot be separated from the previous specimen, and is even a trifle larger, measuring one inch long by one and three-quarter inches in width.

So far as I am acquainted with *M. substriata*, one of its chief specific points is the largely extended posterior wing, much larger in proportion to the size of the shell than in any other *Maccoyella*. The right valve is unknown to me.

Loc. and Horizon.—Bungeworgorai Creek, near Mount Abundance—Rolling Downs Formation (Lower Cretaceous); Corporation Quarry, Maryborough—Desert Sandstone Series (Upper Cretaceous).

Collection.—Sweet.

MACCOYELLA ROSTRATA, *sp. nov.*

(Pl. IV., fig. 3).

Maccoyella substriata, Eth. fil., Geol. Pal. Q'land, &c., 1892, p. 564, t. 23, f. 8 and 9 (*non* t. 22, f. 10).

Sp. Char.—Shell of medium size. Left valve convex in the middle line, posteriorly very alate and extended; dorsal margin long on both sides the umbo, but particularly so on the posterior, curving upwards at its extremity, and in conjunction with the posterior margin forming a kind of rostrum, but on the anterior it is oblique; posterior end flattened and extended, the margin declining obliquely towards the ventral, which is rounded; two or three resilium furrows along the posterior dorsal margin; anterior end small, produced, the margin rounded; sculpture of twelve (? or a few more) primary costæ, which do not appear on the posterior end.

Obs.—I formerly referred two specimens, with doubt, to *M. substriata*, one having the dorsal margin on the posterior side gradually curving upwards to assist in forming a rostral prolongation. Since the period in question, another example has turned up in Mr. Sweet's

cabinet, from the same locality as the former specimens (Dr. R. L. Jack's), and again accompanied by its right valve. So far as the structure of *M. substriata* proper can be made out, there does not appear to be any tendency to form this rostral posterior dorsal end; possibly, on this account, there may be two species, otherwise closely allied, but this is only one of the many doubtful points that future collectives can clear up.

The right valve is very imperfectly known. I figured what I believed to be it,* and this opinion is supported by the fact that, in the more recently acquired example, a similar valve peeps out on the surface of the matrix from below the left valve. It exhibits numerous radiating costæ of the first order, with intermediate secondary radii, crossed by delicate concentric lines representing the frills of the larger species of the genus.

Loc. and Horizon.—Corporation Quarry, Maryborough—Desert Sandstone Series (Upper Cretaceous).

Collection.—Sweet.

Genus Pinna, Linnæus, 1758.

(Syst. Nat., 1758, Ed. x.)

PINNA AUSTRALIS, Hudleston.

P. australis, Hudleston, Geol. Mag., 1890, vii. (3), p. 244, t. 9, f. 6.

? *Pinna*, *sp. ind.*, Eth. fil., Geol. Pal. Q'land, 1892, p. 465, t. 20, f. 16 and 17.

Obs.—Four specimens of a *Pinna* are in Mr. Sweet's collection. Three of these are in a very poor condition, but from Mr. Hudleston's description of the sculpture, I am led to believe that they may be referable to his species, at the same time I am not able to distinguish the curvilinear concentric lines described by him. These fragments are from the Upper Cretaceous of Maryborough. A fourth example, however, from the lower division of the series at Hughenden, leaves less room for doubt, for the curvilinear lines are there visible.

The straight plain costæ on the Maryborough specimens ally them with *Pinna calamitoides*, Shumard,† from the Cretaceous of Vancouver Island; and also *P. Lakesi*, White,‡ occurring in the Cretaceous rocks of North Colorado.

P. australis is believed by Mr. Hudleston to be intermediate between the cuneate and tetragonal species of the genus, but rather to approach more nearly *P. tetragona*, Sby.

On the whole I think it may be accepted that the Queensland Lower Cretaceous form is *P. australis*, with the possibility that the three portions from the Maryborough beds are so also.

Loc. and Horizon.—Hughenden—Rolling Downs Formation (Lower Cretaceous); ? Corporation Quarry, Maryborough—Desert Sandstone Series (Upper Cretaceous).

Collection.—Sweet.

* Geol. and Pal. Q'land, &c., 1890, t. 23, f. 8.

† Whiteaves, Canadian Mesozoic Fossils, 1879, i., Pt. 2, t. 20, f. 1 a and b.

‡ Contributions to Pal., No. 2, 1880, t. 2, f. 1 a and b.

Genus Mytilus, Linnæus, 1758.*
(Syst. Nat. 758, Ed. x. i., p. 704.)

MYTILUS PALMERENSIS, sp. nov.
(Pl. II., fig. 9.)

Mytilus inflatus, Ten. Woods (*non* Moore), Journ. R. Soc. N. S. Wales for 1882 (1883), xvi., p. 153, t. 10, f. 11.

Mytilus inflatus (pars), Eth. fil., Geol. Pal. Q'land, &c., 1892, p. 467.

Sp. Char.—Shell large, irregularly rhomboidal, of graceful proportions; valves regularly rounded and convex, without prominent diagonal ridges, or marked posterior slopes. Cardinal margins short; escutcheon small and narrow. Anterior and ventral margins combined obliquely rounded, the anterior end completely closed; posterior margins non-truncate, but long and gently curved, forming with the ventral margins a very obtuse postero-ventral angle. Umbones quite terminal, obtuse, depressed, incurved, but hardly touching. Sculpture consisting of well-marked concentric fine and sharp laminar lines gathered into bundles at the anterior ends, with the interspaces slightly concave, and bearing numerous fine concentric striæ; the second shelly layer is microradiate.

Obs.—In my former description I placed this shell with a note of interrogation as a synonym of *Mytilus inflatus*. Moore,† remarking: “Mr. Tenison Wood’s figure represents a still larger individual, and one posteriorly so much more lengthened than Moore’s figure, that I would prefer for the present to withhold a conclusive opinion as to its identity.” Mr. Woods stated that his specimen was double the size of Moore’s species. Had he stated three times it would have been nearer the mark; it is two and three-quarter inches in longitudinal diameter. After the above remarks were written I received from Dr. R. L. Jack a second specimen, agreeing in every particular with Ten. Wood’s type, and I am now of opinion that my former surmise of the specific dissimilarity of the Palmer River shell and Moore’s *M. inflatus* was correct.

M. palmerensis besides being a larger shell than *M. inflatus* presents a greater expanse of shell surface in the same plane, and is without the marked umbonal slope of the latter; the escutcheon is likewise far smaller in proportion to the size of the valves.

Loc. and Horizon.—Fairlight, Upper Flinders River—Rolling Downs Formation (Lower Cretaceous). Wood’s specimen came from the Palmer River, hence the specific name.

Collection.—Geological Survey of Queensland. (*Pres.* A. Thomson.)

Genus Inoceramus, Parkinson, 1819.
(Trans. Geol. Soc., 1819, v., p. 55.)

Obs.—*Inoceramus* is largely developed in the Lower Cretaceous of Queensland, particularly in the beds of the Flinders River, about Hughenden and Marathon, but is, so far, unknown in the Lower Cretaceous of Western New South Wales, and in the Upper

* The name *Mytilus* should give place to that of *Perna*, Adanson (*non* Brongniart).

† Quart. Journ. Geol. Soc., 1870, xxvi., p. 252, t. 13, f. 4.

Cretaceous (Desert Sandstone) of the Maryborough and Croydon areas. It however occurs in this latter series in the White Cliffs District of New South Wales. Only one example is known to me from South Australia, a gypseous cast in a very poor state of preservation, collected by Mr. H. Y. L. Brown.

The following species have been named or described from our Cretaceous rocks:—

Inoceramus	Carsoni, <i>McCoy</i> .
„	Sutherlandi, <i>McCoy</i> .
„	problematicus, <i>Eth.</i>
„	marathonensis, <i>Eth.</i>
„	pernoides, <i>Eth.</i>
„	elongatus, <i>Eth.</i>
„	Cripsii, <i>Mantel</i> .
„	maximus, <i>Lumholtz</i> .

The two first were never described or figured by their author, although referred to by him in a comparative sense in two short papers. It would, unquestionably, have been an advantage to palæontological science had they been disregarded from the first, for the retention of these names has been the cause of confusion in attempts by others to determine the species; but having myself assisted to retain McCoy's names, it would now be illogical on my part to abandon them, unless this can be done strictly in accordance with the laws of nomenclature. At the time I wrote my portion of the work common to Dr. R. L. Jack and myself, I felt from this cause and the invariable poor state of the specimens, very undecided as to my identification of *I. Carsoni* and *I. Sutherlandi*, and their relation to the forms described by Mr. R. Etheridge, F.R.S. Since that time I have had, through the kindness of the late Sir F. McCoy, an opportunity of examining the original specimens used by him, and I find that my conclusions were just the opposite of what they should have been; in other words, the form I took to be *I. Carsoni* is *I. Sutherlandi*, and *vice versâ*. Furthermore, *I. pernoides*, *Eth.*, is also *I. Carsoni*, but *I. marathonensis*, *Eth.*, is, in all probability, a good species. There is now, however, a strictly justifiable method of abandoning the objectionable names, as will be shown below. *Inoceramus elongatus*, *Eth.*, is, I am afraid, too imperfectly figured for future recognition. Of the form referred by me to *I. Cripsii*, I have no further information, but a new and well-marked species is introduced as *I. constrictus*.

INOCARAMUS ETHERIDGEI, *nom. nov.*

- I. Carsoni*, McCoy, Ann. Mag. Nat. Hist., 1865, xvi. p. 334 (*neither description nor fig.*).
- I. Carsoni*, McCoy, Trans. R. Soc. Vict., 1866, vii., p. 50 (*neither description nor fig.*).
- I. Carsoni*, McCoy, Ann. Mag. Nat. Hist., 1867, xx., p. 196 (*neither description nor fig.*).
- I. pernoides*, *Eth.* (*non Goldf.*), Quart. Journ. Geol. Soc., 1872, xxviii., p. 343, t. 22, f. 3.

? *I. problematicus*, Eth. (non D'Orb.), *Ibid*, p. 344, t. 22, f. 4.

I. Carsoni, Eth. fil., Geol. Pal. Q'land, &c., 1892, p. 463 (non t. 25, f. 9 and 10).

I. pernoides, Eth. fil., *Ibid*., p. 464, t. 25, f. 7, 8, and 12.

I. sp. ind., Eth. fil., *Ibid*, t. 21, f. 19.

Sp. Char.—Shell more or less mytiloid in outline, acuminate towards the umbones, convex, especially in the umbonal regions; test thick; hinge lines or cardinal margins straight, about half the length of the shell. Anterior ends, strictly speaking, wanting. Posterior wings small, not differentiated from the body of the shell except by a general flattening of the valves, the margins obliquely rounded. Ventral margins rather widely curved, swelling out towards the posterior, and gradually insinuated towards the umbones anteriorly. Umbones quite terminal and acute. Sculpture consisting of raised concentric lines, at irregular distances apart, sometimes grouped in bundles of two, three, or four, and reposing on wide flattened concentric folds.

Obs.—The above synonymy indicates that as Sir F. McCoy's name was in no instance accompanied either by a description or figure, that of Mr. Etheridge should, by the rules of nomenclature take precedence. It is, however, unfortunate that the name *pernoides* had, according to Bronn,* been previously thrice used in a specific sense—by Goldfuss, Portlock, and Matheron. The two first I have verified, but the third I have not seen; Portlock's shell is a Carboniferous species and a very doubtful *Inocaramus*. Under the circumstance, and with the view of avoiding this confusion, I propose for this fossil the name of *I. Etheridgei*, in honour of Mr. R. Etheridge, F.R.S.

I. Etheridgei may be distinguished from the other Australian species of the genus by its mytiloid outline, absence of an anterior end strictly speaking, and the well-defined nature of its sculpture. In the first of these characters, and the attenuated outline umbonally, *I. Etheridgei* closely resembles *I. lucifer*, Eichwald,† from the Cretaceous rocks of the Aluetian Islands, *I. simplex*, Stoliczka,‡ of the Indian Cretaceous, and *I. lingua*, Goldfuss.§ An alliance is more apparent with the smaller forms figured by D'Orbigny as *I. problematicus*|| than with the elongated examples of the same species.¶

I. Etheridgei attains to several inches long, and is a massive species, with a test sometimes as much as a quarter of an inch thick.

Loc. and Horizon.—Marathon and Hughenden Stations—Rolling Downs Formation (Lower Cretaceous). (The three last localities given by me formerly should probably be attached to *I. maximus*, Lumholtz.)

Collection.—Sweet.

* Index Pal., 1848, i., p. 612.

† Geogn. Pal. Bemerkungen Halbinsel Mangischlak u. d. Aleutischen Inseln, 1874, p. 194, t. 18, f. 5 and 6.

‡ Pal. Indica—Cretaceous Fauna of India, 1871, iii., Pts. 5-8, t. 28, f. 3, 4.

§ Petrefacta Germaniæ, Theil 2, t. 111, f. 5.

¶ Pal. Franç. Terr. Crét., iii., t. 406, f. 1-5.

|| *Ibid.*, f. 6 and 7.

INOCERAMUS MAXIMUS, *Lumholtz.*

- I. Sutherlandi*, McCoy, Ann., Mag. Nat. Hist., 1865, xvi., p. 334
(neither description nor fig.).
- I. Sutherlandi*, McCoy, Trans. R. Soc. Vict., 1866, vii., p. 50 (neither
description nor fig.).
- I. Sutherlandi*, McCoy, Ann. Mag. Nat. Hist., 1867, xx., p. 196
(neither description nor fig.).
- I. Carsoni*, Eth. fil., Geol. Pal. Q'land, &c., 1892, t. 25, f. 8, 9, and 12
(excl. Obs., &c.).
- I. Sutherlandi*, Eth. fil., *Ibid.*, p. 463 (excl. two last localities.)
- Inoceramus*, *sp. ind.*, Lundgren, Bihang K. Svenska Vet.-Akad. Handl.,
1886, xi., No. 5, p. 4, pl.
- I. maximus*, Lumholtz, Among Cannibals, 1890, p. 367, fig.

Sp. Char.—Shell attaining a large size; sub-triangular or irregularly rhomboidal, most convex somewhat nearer the ventral than the dorsal margin; test thick. Hinge lines or cardinal margins moderately long, but not equal to the length of the shell. No anterior ends strictly speaking in front of the umbones, but from the beaks downwards the margins are oblique; posterior ends more or less flattened, the margins obliquely truncated and the postero-dorsal angles well rounded. Umbones quite terminal, obtuse. Sculpture consists of laminae of growth, coarse and somewhat rugged on and a short distance below the umbones; but widening out towards the posterior.

Obs.—For reasons similar to those given under *I. peronoides*, the name *I. maximus*, Lumholtz, must take precedence over that given by McCoy.

This is certainly the largest Australian *Inoceramus* but one, specimens reaching to nine inches long.

In one of the best preserved examples the umbones are widely separated by a space for the reception of an inordinately large cartilage, the surface of the area at the spot in question being gently cretulated, but without pits.

Amongst Mr. Sweet's specimens is the remains of a very large individual, that from its imperfection cannot be specifically determined. When perfect it must have been over one foot long, and is apparently a curved and flattened form. The hinge line seems to be very short, rounding off into the obliquely curved posterior margin. Whether an enlarged form of the present species, or distinct, it is impossible to say, but probably the latter. It is from Marathon.

A large specimen of *I. maximus* in the Geological Survey of Queensland collection, from Hughenden; is eight and a-half inches long by six inches wide, and four inches through the united valves.

Loc. and Horizon.—Hughenden and Marathon Stations—Rolling Downs Formation (Lower Cretaceous).

Collections.—Sweet; and Geological Survey of Queensland.

INOCERAMUS CONSTRICTUS, *sp. nov.*

(Pl. II., fig. 7; Pl. III., fig. 6.)

Sp. Char.—Shell irregularly quadrate; valves moderately convex flattened posteriorly, sulcate anteriorly. Hinge lines or cardinal margins straight, not extending the entire width of the shell; area

narrow, with wide and shallow resilifers. Anterior ends convex or bourrelet-like, divided off from the body of the shell by cinctures of variable width and depth, extending from just anterior to the umbones to the ventral margins; posterior ends sub-alate, the margins sub-truncate and oblique above, and without emargination, rounded below. Greatest convexity of the valves immediately posterior to the cinctures, and in a vertical line with the umbones, which are small and not incurved. Sculpture consisting of numerous concentric corrugations, which, with interpolated finer lines, are deflected upwards at the cinctures, and individually have a rolling or wavy course across the valves; on the posterior ends the corrugations become laminar and sub-imbricate.

Obs.—This form appears to be one of the best marked amongst the Australian species of *Inoceramus*, and may be distinguished by the anterior cinctures. When the latter are at all deep, the anterior ends become bourrelet-like. In one specimen from the Geological Survey of Queensland collection there is a very small anterior ear visible immediately at the termination of the hinge line. The majority of the specimens average about two and a-half inches, but it has been noted up to four and a-half inches long.

Loc. and Horizon.—Hughenden and Marathon Stations; Flinders River, behind Hughenden Hotel—Rolling Downs Formation (Lower Cretaceous).

Collections—Sweet; and Geological Survey of Queensland (*Pres. E. K. Ogg*).

Genus *Malletia*, *Desmoulins*, 1832.

(*Act. Soc. Lin. Bordeaux*, 1832.)

MALLETIA RANDSI, *Eth. fil.*

Nuculana (? *Yoldia*) *Randsi*, *Eth. fil.*, *Geol. Pal. Q'land, &c.*, 1892, p. 566, t. 26, f. 10.

Sp. Char.—Shell large, transversely elongate and ovate, tumid in the umbonal region, rostrate posteriorly. Dorsal or cardinal margins slightly convex anteriorly, straight or somewhat concave posteriorly; ventral margins rounded, obliquely so posteriorly; anterior ends well developed, tumid, and produced, the margins rounded; posterior ends produced, rostrate, gradually compressed and somewhat tilted upwards, the extreme margins rounded. Umbones sub-central, tumid; beaks approximate; anterior slopes rounded, the posterior more flattened, no diagonal ridges strictly speaking; chondrophore absent; teeth numerous, about twenty on each side, decreasing rapidly in size on both sides towards the centre; escutcheon long and narrow; ligament opisthodontic, external, short; adductor scars faint; pallial line strongly marked, with a wide and deep sinus, and a long linear pallial tongue; sculpture fine and concentric.

Obs.—*Malletia Randsi* was originally described from an internal cast, and there are in Mr. Sweet's collection four examples in the same condition, all decidedly larger than the type, more tumid, and with proportionately longer posterior ends. The latter, through a more or less upward curvature of the cardinal margins, are to some extent rostrate. The type specimen was by no means perfect, and I now find that the illustration of it, although correct so far as it goes, by no means gives a correct idea of the shell.

Many of the Maryborough fossils, from their peculiar method of fossilization, become distorted and crushed, and it is possible that the present specimens may even exhibit too great a degree of timidity, judging by a few almost perfect examples that have come under my notice from the Lower Cretaceous in other collections. The Maryborough specimens conclusively prove that a chondrophore was absent, and that the teeth were continuous beneath the beaks; this at once eliminates from consideration my suggested reference to *Yoldia*. An example in Prof. R. Tate's collection from South Australia possesses a ligament, and another in the Sydney University collection, from Dunlop, is similarly provided. Prof. Tate referred his specimens to *Solenella* (= *Malletia*), a reference supported by the deep and wide pallial sinuses, seen on one of them. Other features said to be present in *Malletia* are not visible here, and an element of doubt must still exist in connection with the genus of this shell.

I am perplexed as to the relation of *M. Randsi* to *Leda elongata*, Eth. (*Adrana*, mihi.) The latter was evidently described from an imperfect fossil, but with certain details of restoration, the figure would undeniably come very near to the former. It entirely depends on the ultimate generic reference of *L. elongata*, whether or no the name will stand. If it be an *Adrana*—which I now much doubt—the name must go, for one of the Sowerbys has described a recent *Leda elongata*, the type of the genus *Adrana*, Adams.

I hope to throw more light on this question when dealing with the South Australian Cretaceous fossils.

Loc. and Horizon.—Maryborough—Desert Sandstone Series (Lower Cretaceous).

Collection.—Sweet.

Genus Solemya, Lamarck, 1818.

(Hist. Nat. Anim. sans Vertèb., 1818, v., p. 488.)

SOLEMYA CRETACEA, *sp. nov.*

(Pl. IV., fig. 2.)

Sp. Char.—Shell transversely elongate, moderately convex. Cardinal margins long and straight, ventral margins centrally straight. Anterior ends very long, convex, margins rounded; posterior ends short, margins rounded; posterior diagonal ridges obtusely rounded, and the posterior slopes somewhat flattened. Umbones very excentric; post-medial sculpture of many (apparently twenty) acute radiating costæ, some of them arranged in pairs, separated by shallow valleys, with a few concentric laminæ, generally indistinct on the flanks of the valves, but more apparent on the posterior ends; a few very delicate concentric lines are also visible, but the valve surfaces are otherwise smooth and shining.

Obs.—In the absence of internal features it is difficult to seize upon external ones, other than the sculpture, of an essentially distinctive character. The sculpture and the form of the shell appear to be so typically those of *Solemya* that I do not hesitate to refer the fossil to that genus.

Very few species of Cretaceous *Solemya* appear to have been described. Stoliczka, at the time he wrote,* recorded only two, *Solemya subplicata*, Meek and Hayden, and *S. ventricosa*, Conrad, both American forms. To these must now be added *S. occidentalis*, Stanton,† from the Cretaceous of California, and *S. costata*, Tullberg,‡ a Nova Zembla species.

Solemya subplicata, M. and H.§ is a small shell without posterior radiating costæ, and from *S. occidentalis*, Stanton, the Queensland shell is at once distinguished by its greater size and straight dorsal and ventral margins. *S. costata*, Tullberg, is a name applied to a fragment only.

Loc. and Horizon.—Walsh River—Rolling Downs Formation (Lower Cretaceous).

Collection.—Geological Survey of Queensland (*Pres.*, A. Brand).

Genus Tatella, gen. nov.

Gen. char.—Shell transversely elongated, more or less psammobiiform, equivalve, subinequilateral, generally compressed, slightly oblique towards the anterior, which is frequently the longer of the two ends, both of which gape. Cardinal margins much thickened, particularly anteriorly, bearing two almost central cardinal teeth in the right valve, and one large similar tooth in the left valve, received between the two former; no lateral teeth. Ligament short and thick, anterior adductor impressions elongately pyriform and oblique; posterior adductor impressions round. Pallial line slightly sinuated, the sinus wide and very shallow. Sculpture concentric.

Obs.—In 1892 I published the type of this proposed genus as *Corbicella? maranoana*, not that it possessed any particular relation to that genus, but more from a fancied external resemblance, and an inability to place it elsewhere. The internal characters were, at that time, imperfectly known to me, but by means of further material I have succeeded in deciphering them moderately well. As I am still unable to locate the shell with any degree of confidence in any of the described genera, I am constrained to propose for it a new name, and in doing so find particular pleasure in associating with it the name of my good friend Prof. Ralph Tate. His services to Palæontology have already been acknowledged by the institution of the genus *Tatea*, Ten. Woods, but the variation to *Tatella* will be sufficient to distinguish the two.

I believe *Tatella* to be a member of the Psammobiidæ, having relations with both *Psammotæa*, Lamarck, and *Quenstedtia*, Morris, and Lycett. There is, however, one very marked difference between it and members of this family generally, except, perhaps, *Quenstedtia*—viz., the wide and shallow pallial sinus.

I cannot find any trace of lateral teeth. The cardinal of the left valve is large and blunt; those of the right valve abutting on each side of it are smaller, and are so placed as to almost form a fossette for its reception. In both valves the centre of the hinge-plate holding these teeth is supported by a strong although very short ossiculum.

* Pal. Indica. Cret. Fauna S. India, 1871, iii, Nos. 5-8, p. 271.

† Bull. U.S. Geol. Survey (Walcott's), No. 133, 1898, p. 55, t. 10, f. 2 and 3.

‡ Vet.-Akad. Handlingar, 1880, vi, No. 3, p. 11, t. 1, f. 15 and 16.

§ Meek, U.S. Geol. Survey Report (Hayden's), 1876, ix, p. 129, t. 28, f. 19.

Internal casts differ much in appearance from testiferous specimens, the dissimilarity arising chiefly from the thickening of the anterior portion of the hinge-plate, which conveys to the cast an apparent uprising of the dorsal margin. The anterior ends are also in some instances the longer of the two extremities of the shell, which conveys to the latter a rather *Solemya*-like appearance. The anterior adductor impressions are peculiar both in position and shape, for they are immediately under the dorsal margins of the valves, sub-parallel to them, elongately-obliquely pyriform, and limited post-ventrally by shelly ridges which leave stronger impressions at those points. The posterior adductor impressions are oval, or nearly round, and are again close under the dorsal margins.

The pallial impressions are placed well within the ventral margins, short, well rounded, and devoid of pallial tongues,* the sinuses being broad and very shallow. The condition here seen very closely resembles the form of the sinuses in the genus *Cultellus*.

Like those of *Psammobia* and its allies, the valves in *Tutella* gaped at both ends, were more or less compressed, and with small and contiguous umbones. As in one genus (*Psammotea*) there is one cardinal tooth in the left and two in the right valve, interlocking and placed immediately below the umbones; furthermore, lateral teeth are absent. If *Quenstedtia* be correctly placed in the *Psammobiidae*† there are further points of resemblance, such as the elongated anterior adductor impression, the oval posterior, and the very shallow pallial sinus.

I am not acquainted with *Tutella* other than in Australian Cretaceous rocks, and at present only one species is comprised within it, which forms the type.

TATELLA MARANOANA, Eth. fil.

(Pl. I., fig. 5; Pl. II., fig. 8.)

Corbicella? *maranoana*, Eth. fil., Geol. Pal. Q'land, &c., 1892, p. 471, t. 27, f. 4 and 5; t. 28, f. 2 and 3.

Obs.—In addition to the characters given under the genus, which are equally those of the species, it may be added that the ventral margins of the valves are rounded, curving rapidly upwards to the obliquely sub-truncate posterior margins, the anterior ends being extended and rather pointed. The sculpture consists of irregularly spaced concentric laminae, with intermediate finer lines, but no radii.

In two out of the three testiferous specimens I have seen the umbones were eroded.

The following measurements were noted:—In testiferous specimens—(1) two and one-eighth inches wide and one and one-sixteenth inches long; (2) two inches wide and one inch long. In casts—(1) one and a-half inches wide and three-quarters of an inch long; (2) one and three-quarter inches wide and thirteen-sixteenths of an inch long.

Loc. and Horizon.—Maranoa River, half-a-mile above Mitchell Railway Station—Rolling Downs Formation (Lower Cretaceous).

Collection.—Geological Survey of Queensland.

* Languette palléale (Fischer).

† Fischer, *Man. Conchyl.*, 1887, p. 1106.

Genus *Glycimeris* (*Klein*), *Lamarck*, 1799.
(Mem. Soc. Hist. Nat. Paris, 1799, p. 83.)

GLYCIMERIS RUGOSA, *Moore*, *sp.*

(Pl. IV., fig. 1.)

Panopæa rugosa, *Moore*, Quart. Journ. Geol. Soc., 1870, xxvi., p. 253, t. 13, f. 7.

Panopæa sulcata, *Etheridge*, Quart. Journ. Geol. Soc. 1872, xxviii., p. 21, f. 2a (*non* f. 2.)

Myacites? *australis*, *Hudleston*, Geol. Mag., 1884, i., p. 340, t. 11, f. 9.

Glycimeris rugosa, *Eth. fil.*, Geol. Pal. Q'land, &c., 1892, pp. 478 and 571, t. 28, f. 4 and 5.

Sp. Char.—Shell transversely ovate, anteriorly inflated, convex or tumid in the anterior region, but the amount of convexity variable. Dorsal or cardinal margins straight, rather less than the width of the shell (with raised ridges for attachment of the ligament, *Moore*); ventral margins very slightly rounded, or nearly straight. Anterior ends thick and broad, the margins rounded or sub-truncate; obtuse diagonal ridges are present, and the anterior slopes flattened. Posterior ends gradually attenuated laterally, gaping almost from the umbones along the dorsal margins; diagonal ridges rounded, and the posterior slopes inconspicuous; margins rounded, hardly at all reflected to form the gape. Umbones acute, approximate, and incurved slightly towards the anterior, much depressed or flattened from above; and in consequence of the presence of both anterior and posterior diagonal slopes, the umbonal region presents an isolated appearance. Anterior adductor impressions faint; the posterior well marked. Pallial sinuses deep and moderately wide. Sculpture, consisting of irregular rough concentric rugæ, stronger on the anterior ends, and with intermediate finer lines of growth, and an epidermal covering of anastomosing fibres; on the umbones the concentric rugæ are fine and very regular.

Obs.—*G. rugosa* may, on the whole, be described as a solid and heavy shell. On two specimens I have seen what seems to be a ligament; it was short and thick.

I have not been able to study the hinge structure of this species beyond ascertaining that a process existed in at least one of the valves.

The posterior gape of the valves is very apparent in all specimens that have passed through my hands, but an anterior gape is by no means so certain. It is seen in the figure* previously given by me, but, on the other hand, examples are in Mr. Sweet's cabinet in which the valves at the anterior end are most certainly closed. Whether or no this is only the result of a *post-mortem* relaxation of the ligament, and a consequent fore-and-aft rocking of the valves, whereby they have become closed at the anterior end, it is impossible to say, but it may be so.

Loc. and Horizon.—Maranoa River, near Mitchell, and Wollumbilla—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

* Geol. and Pal. Q'land, &c., 1892, t. 28, f. 5.

GLYCIMERIS MACCOYI, Moore, sp.

Panopæa Maccoyi, Moore, Quart. Journ. Geol. Soc., 1870, xxvi., p. 253, t. 13, f. 8.

Panopæa sulcata, Etheridge, *Ibid*, 1872, xxviii., p. 342, t. 21, f. 2, (non f. 2a.)

Glycimeris Maccoyi, Eth. fil., Geol. Pal. Q'land., &c., 1892, p. 480.

Glycimeris sulcata, Eth. fil., *Ibid*, p. 571, (non t. 17, f. 18).

Sp. Char.—Shell transversely ovately-oblong, moderately large, tumid, almost equilateral, and gaping posteriorly. Dorsal or cardinal margins long, straight, and thickened internally; ligamentary fulcrum small; ventral margins slightly rounded, or almost straight. Anterior ends tumid, falling away rapidly to the margins, which are more or less truncate and squared; posterior ends tumid behind the umbones, rapidly thinning off towards the margins, which are rounded, but somewhat oblique above, gaping from the umbones, but not reflected. Umbones sub-central, more anterior than posterior, tumid, incurved, and moderately close, flattened from above; posterior slopes undefined. Posterior adductor impressions broadly or roundly pyriform. Sculpture consisting of wide-apart laminar rugæ, apparently to some extent dying off on the posterior ends, each lamina carrying finer lines of growth, and the whole at times much wrinkled.

Obs.—As I have already elsewhere observed, examples of *Glycimeris sulcata*, Eth., from the Upper Cretaceous are usually so crushed and often distorted that it is difficult to arrive at a clear conception of their characters, but two good casts in Mr. Sweet's collection, aided by a fairly well preserved example in that of Prof. R. Tate, with the test to some extent preserved, from the Lower Cretaceous, lead to the conclusion that one of Mr. Etheridge's figures must be regarded as identical with Moore's species. The other (f. 2a) seems to me to be *G. rugosa*, Moore.

The hinge structure is not that of a *Mya*, but approximates much closer to that of *Glycimeris*. In the best preserved of the casts just referred to, there appears to be evidence of a tooth, or process, in each valve fitting into sockets in the opposite respectively, but I have not been able to trace interrupted pallial lines, nor are the posterior adductor impressions elongated. I cannot satisfactorily determine an inequality in the valves, as suggested by Mr. Moore, and if the valves gape at the anterior end of the shell, it must be to a very slight extent.

Loc. and Horizon.—Corporation Quarry, Maryborough—Desert Sandstone Series (Upper Cretaceous).

Collection.—Sweet.

CEPHALOPODA.

Genus Haploceras, Zittel, 1870.

(Ceph. Stramberger Schichten, 1870, p. 166.)

HAPLOCERAS DAINTREEI, Etheridge, sp.

(Pl. I., fig. 3; Pl. II., fig. 6.)

Ammonites Daintreei, Eth., Quart. Journ. Geol. Soc., 1872, xxviii., p. 346, t. 24.

Haploceras Daintreei, Eth. fil., Geol. and Pal. Q'land, &c., 1892, p. 495, t. 29, f. 1-3.

Sp. Char.—Shell discoidal, large, compressed; aperture high. Whorls, four preserved, rounded or subangular, the sides or flanks more or less flattened and convergent; abdominal angles rounded; umbilicus telescopic, moderately wide, and rather deep; the last whorl preserved exposing less than half the preceding, and the latter still less of the next oldest; umbilical edges of the whorls straight walled. Venter narrow and rounded, without keel; aperture broad-oval, high, the impressed zone moderately deep; siphuncle absolutely sub-ventral, one-eighth inch in diameter in a whorl with a transverse diameter of two and a-quarter inches immediately below the test, and traceable in decorticated specimens along the venter periphery; septa become less and less concave towards the last; septal necks short. Sutural lines of the septa both complex and deeply incised; ventral or siphonal lobes short, terminating in two short prolongations; superior lateral lobes very long, terminating in three principal branches or leaves, the centre one itself in three divisions; inferior lateral lobes narrow and long, only slightly less than the first lateral; first and second auxiliary lobes short, only serrate, without further subdivision; antisiphonal lobe deep; external saddles with two forward and two lateral leaves, the forward each of two branches, the lateral simple; first lateral saddle like the external only rather smaller; second and third lateral saddles not deeply divided. Sculpture consists of closely arranged, generally equal, rounded, or at times sub-angular ribs passing over the venter, becoming larger and less equal towards the aperture; intervening valleys shallow; neither furrows nor varices.

Obs.—This species appears to be of the type of *Haploceras Beudanti*, D'Orb. sp., and is a very characteristic fossil in a certain horizon of the Lower Cretaceous, developed in the basin of the Flinders River.

In no specimen that has passed through my hands have either the auricles or the ventral rostrum of the aperture been preserved. The sutures are very complex and difficult of description. No complete body whorl, or living chamber has yet been described, but the greater portion of it is exhibited in one specimen that I have succeeded in sectioning.

Loc. and Horizon.—Hughenden, Flinders River—Rolling Downs Formation (Lower Cretaceous).

Collections.—Sweet; and Geological Survey of Queensland.

HAPLOCERAS FLINDERSI, *McCoy*, sp.

Ammonites Flindersi, McCoy, Ann. Mag. Nat. Hist., 1865, xvi., p. 334; *Ibid*, 1867, xx., p. 196.

Ammonites Flindersi, McCoy, Trans. R. Soc., Vict., 1866, vii., p. 51; *Ibid*, 1868, viii., Pt. 1, p. 42.

Ammonites Beudanti, var. *Mitchelli*, Eth., Quart. Journ. Geol. Soc., 1872, xxviii., p. 345, t. 23.

Ammonites Flindersi, Eth. fil., Cat. Austr. Foss., 1878, p. 115.

Haploceras Flindersi, Eth. fil., Geol. and Pal. Q'land, &c., 1892, p. 494, t. 30, f. 1-3.

Obs.—Several fragmentary specimens, not sufficiently perfect to enable me to draw up any better description than that already existing,

still show that the ribs and folds described by Mr. Etheridge become strongly marked rounded varices on the venter, losing this feature on the flanks of the shells. In addition, one specimen exhibits distinct traces of fine spiral lines on the narrow periphery, producing a fine cancellation with the falciform striæ. In the figures of the late Mr. Daintree's specimens, given by Mr. Etheridge, these varices show on the flanks, and apparently not on the venter. Each varix is immediately preceded and followed by a shallow groove, the rear one often the more pronounced. There is, in fact, a strange combination of the sculpture features of Mr. Etheridge's *H. Mitchelli* and *H. Sutherlandi* in these specimens. The umbilicus, although ill preserved, seems to be narrow as in the latter of the two forms mentioned. Taken altogether, I am by no means satisfied either with this determination, or with the respective status of the two species in question. Some of the varices bear a single blunt and badly developed node in the middle line. There are no sutures visible.

The specimens are more or less compressed, with slightly convergent flanks and the abdominal angles well rounded.

Loc. and Horizon.—Marathon Out Station, Marathon—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

Genus Amaltheus, De Montfort, 1808.

(Conch. Syst., 1808, i., p. 91.)

AMALTHEUS OLENE, Ten. Woods.

(Pl. II., fig. 4.)

Ammonites olene, Ten. Woods, Journ. R. Soc. New South Wales for 1882 (1883), p. 150, t. 7, f. 2; t. 8, f. 1.

Ammonites olene, Eth. fil., Geol. Pal. Q'land. &c., 1892, p. 492, t. 29, f. 5; t. 30, f. 4.

? *Ammonites fontinalis*, Hudleston, Geol. Mag., 1890, vii. (3), p. 241, t. 9, f. 1.

Sp. Char.—Shell discoid, more or less compressed, number of whorls unknown, the inner nearly concealed by the last developed; test thin; flanks slightly convergent and divergent, but only slightly convex; venter tent-shaped and keeled, the keel prominent and rounded; umbilicus narrow, its edge sharp and straight-walled within, exposing small portions of some of the inner whorls; aperture high and narrow. Lobes and saddles of the septa intricate, the former narrow and elongate. Sculpture of strong somewhat flattened sigmoidal and occasionally bifurcating costæ; the latter narrow, close, and sub-radiate around the umbilicus, acutely bent forward in the middle line of the flanks, thence broadening out but not passing over the venter, spiral lines absent; at the forward inflection is an obtuse spiral or concentric ridge, from which the flanks are convergent towards the venter, and divergent towards the umbilicus.

Obs.—At first sight *A. olene* is very like *A. walshensis*, mihi,* but in the latter the venter is knife-edged, without a keel proper;

* Geol. Pal. Q'land, &c., 1892, p. 493, t. 42, f. 10 and 11.

there is a spiral sculpture in addition to sigmoidal costæ, and the shell was probably even more compressed than in *A. olene*. The keel of the latter is decidedly cristiform, standing well above the venter, with a shoulder beneath it on each side. From the appearance of the crested venter in this species, I think the presence of a ventral lobe over the aperture may be inferred. So far as the characters of *A. olene* and *A. walshensis* are known, the two forms appear to be distinct; at the same time some of the characters of the two Ammonites so closely correspond that, allowing for differences of preservation, they may be identical.

Amaltheus Whiteavesi, White,* from the Cretaceous of Alaska, is specifically very close to *A. olene* in form and sculpture, but the digitations of the septa are unlike.

I have not been able to trace out a complete septum, but the digitation was very intricate.

Loc. and Horizon.—Walsh River—Rolling Downs Formation (Lower Cretaceous).

Collection.—Geological Survey of Queensland (Pres. P. F. Sellheim).

Genus Ancyloceras, D'Orbigny, 1842.

(Pal. Franç. Terr. Crét., I., Pt. 2, p. 491.)

ANCYLOCERAS? *sp. ind.*

(Pl. II., fig. 5.)

Obs.—An imperfect Ancyloceriform shell was obtained by Mr. Sweet from the locality mentioned below that is different to any so far found in the Cretaceous of Australia, but still not sufficiently entire for perfect description. It is a naturally weathered longitudinal section of a shell that may be tentatively referred to *Ancyloceras*, although not wholly conforming to the characters of that genus. The portion preserved is two inches long, simply coiled once at the proximal end, or little more than crooked, and terminating with an obtuse point. The straight portion of the shell increases slowly in diameter, and where broken off exhibits a cross section of only half-an-inch. Within this space of two inches there are twenty-six chambers and part of the twenty-seventh, those at the curve being the deepest, whilst at the broken distal end the chambers are comparatively shallow. The septa as seen in section are, at the proximal end, practically straight, but as the shell is ascended, the septa commence to roll, forming three shallow lobes and three similar saddles, the rolling being gentle and wide. At the distal end the matrix is sufficiently worn away to display the siphon, which is large and well within the margin of the shell.

Loc. and Horizon.—Hughenden—Rolling Downs Formation (Lower Cretaceous).

Collection.—Sweet.

* Bull. U.S. Geol. Survey (Powell's), 1889, No. 51, p. 69, t. 13, f. 1-5.

Genus Nautilus, Breynius, 1732.
(Dissertatio Phys. Polythalamiis.)

NAUTILUS (CYMATOCERAS?) HENDERSONI, *Eth., fil.*

(Pl. I., fig. 1 ; Pl. II., figs. 1-3.)

Nautilus Hendersoni, *Eth. fil. (m.s.)*, *Geol. Pal. Q'land, &c.*, 1892, p. 502.

Sp. Char.—Shell sub-globose, of medium size, deeply umbilicated in casts. Aperture large, transversely reniform, wider than long, margin gently rolling, the crests and sinuses not strongly marked; umbilical sinuses short; lateral crests wide; hyponomic sinus weak. Venter broadly rounded; impressed zone of the dorsum only moderately deep and wide. Umbilicus deep, slightly funnel-shaped, entirely exposed in casts. Siphuncle large, well marked. Chambers or camerae increasing in length very gradually; section of the volutions from the umbilicus outwards somewhat less than a semicircle, due to a slight lateral flattening. Septa only moderately concave, from sixteen to eighteen to each involution; sutures exceedingly well marked in the cast, the ventral saddle gently rounded, but becoming less and less so as the apex is approached; lateral saddles (near the umbilicus) slightly convex; lateral lobes, with a small degree of concavity, to nearly straight, the whole outline of the suture being a very gentle sigmoidal curve on each side the centre of the venter. Sculpture lines delicate, following the outline of the aperture; no costæ.

Obs.—*Nautilus*, using the term in its widest sense, has hitherto been absent from lists of our Cretaceous fossils, with the exception of the above reference. The present species, of which I have in all seen four specimens, conforms to a well-known Mesozoic type, represented by *Nautilus lævigatus*, D'Orb., *N. elyans*, J. Sby., *N. pseudo-elegans*, D'Orb., &c. Three of the examples are internal casts, or rather non-testaceous specimens, but the fourth has portions of the shelly layers remaining. The largest is five inches in transverse measurement, three and three-quarter inches in height, and three and a-half inches across the widest part of the aperture.

Of the four examples, three probably represent the neanic stage and the fourth or largest the ephibic. The partially testiferous specimen, one of the former, displays the siphuncle in one of the camerae in an absolutely subventran position, but in the largest *Nautilus*, or supposed ephibic stage, the siphuncle on the last exposed septum is as near as possible dorsocentran in position.

From a comparative point of view, specifically speaking, I can point to no better species than the Indian *Nautilus negama*, Blandford,* with its var. *crebricostatus*, and *N. Kaycanus* Blandford,† all of which the Queensland shell very closely resembles. In the Indian forms, however, the outlines of the sutures are much more undulatory; in other words, the convexities and concavities of the

* *Pal. Indica*—Foss. Cephalopoda S. India, Ser. 1, 1861, p. 35, t. 20, f. 2; t. 21, f. 1 and 5; *Stoleczka, Ibid.*, Ser. 3, Pts. 10-13, 1866, p. 211, t. 22, f. 94.

† *Ibid.*, Ser. 1, 1861, p. 31, t. 16, f. 5 and 6; t. 17, f. 1 and 2; t. 18, f. 1 and 2; t. 21, f. 2.

saddles and lobes are greater. It will, I believe, fall into one or other of Hyatt's genera—*Cymatoceras*,* or *Entrepheoceras* †—possibly the latter, as the shell is not costate.

Named in honour of Mr. J. B. Henderson, Hydraulic Engineer to the Queensland Government.

Loc. and Horizon.—Wellshot Run, near Buraldine; Ilfracombe; Maxwellton, near Hughenden—Rolling Downs Formation (Lower Cretaceous).

Collection.—Geological Survey of Queensland (*Proc.* Messrs. A. Lymburner, — Sheehy, and J Burkett).

III.—DESCRIPTION OF THE FIGURES.

PLATE I.

NAUTILUS (CYMATOCERAS ?) HENDERSONI, *Eth. fl.*

Fig. 1.—Internal cast, side view exhibiting the umbilicus, sutures, and camerae.

Fig. 2.—Venter of the same specimen.

HAPLOCERAS DAINTREEI, *Eth. sp.*

Fig. 3.—Section of a medium-sized specimen exhibiting living chamber, septa, septal necks and camerae.

ISOCRINUS AUSTRALIS, *Moore, sp.*

Fig. 4.—Terminal (?) portions of three arms, the two on the left united by an axil.

TATELLA MARANOANA, *Eth. fl.*

Fig. 5.—Hinge of an internal cast exhibiting the two cardinal teeth of the right valve, and the single cardinal tooth of the left, also the adductor scars.

PLATE II.

NAUTILUS (CYMATOCERAS ?) HENDERSONI, *Eth. fl.*

Fig. 1.—Internal cast exhibiting portion of the venter, sutures, a transversely reniform septum, and the siphuncle.

Fig. 2.—A smaller individual, rather imperfect, with remains of sculpture on the venter.

Fig. 3.—The same reversed, in naturally weathered section, exhibiting septa and siphuncle.

AMALTHEUS OLENE, *Ten. Woods, sp.*

Fig. 4.—Lateral views exhibiting the keeled venter and sigmoidally bent costae on the flanks.

ANCYLOCERAS (?), *sp. ind.*

Fig. 5.—An imperfect example possibly of this genus.

HAPLOCERAS DAINTREEI, *Eth., sp.*

Fig. 6.—A suture with its lobes and saddles.

* *Proc. Boston Soc. Nat. Hist.*, 1884, xxii, p. 301.

Proc. American Phil. Soc., 1893, xxxii, p. 555.

INOCERAMUS CONSTRICTUS, *Eth. fil.*

Fig. 7.—An imperfect example, exhibiting the constriction, or cincture, from immediately in front of the umbone towards the ventral margin. (This drawing requires to be turned a half-circle to the right to bring it into its proper position.)

TATELLA MARANOANA, *Eth. fil.*

Fig. 8.—An example retaining the test.

MYTILUS PALMERENSIS, *Eth. fil.*

Fig. 9.—The right valve nearly entire.

PLATE III.

ISOCRINUS AUSTRALIS, *Moore, sp.*

(*Figs. 1-3* represent different portions of the same specimen.)

Fig. 1.—On the left is arm γ , followed by δ and ϵ , each with thirteen ossicles, or places left vacant by the latter; 1 ax is in each case followed by its respective secundibrachs. On the right of the figure arms θ and i are renewed at the monaxils (1 Ax.)

Fig. 2.—Represents the specimen as seen in *Fig. 3*, somewhat canted forwards. On the left edge portions of arm ϵ are seen; on the centre the bases of the arms θ and i , and beyond the gap these arms are renewed from 1 Ax with succeeding distichals and tetrastichals.

Fig. 3.—At the bottom of the figure part of the dorsal cup is seen on the right, and below it remains of a few primibrachs of arms δ and β , followed by brachialia of arm γ , the left (δ) and right arms (ϵ) of the next ray. In the succeeding ray the left arm (θ) is represented by four monostichals, and the right (i) by three. Beyond the fracture gap appear the monaxils, and some distichals.

TATELLA MARANOANA, *Eth. fil.*

Fig. 4.—Internal cast exhibiting the open and shallow pallial sinus, indication of cardinal teeth cavities, and the adductor impressions.

MACCOYELLA SUBTRIATA, *Moore, sp.*

Fig. 5.—An imperfect left valve, with the alate posterior end.

INOCERAMUS CONSTRICTUS, *Eth. fil.*

Fig. 6.—A large and imperfect example, exhibiting the anterior constriction or cincture.

PLATE IV.

GLYCIMERIS RUGOSA, *Moore, sp.*

Fig. 1.—A nearly entire specimen.

SOLEMYA CRETACEA, *Eth. fil.*

Fig. 2.—A partially decorticated example.

MACCOYELLA ROSTRATA, *Eth. fil.*

Fig. 3.—A partially preserved cast of the left valve, with the right valve showing beneath on the right hand.

MACCOYELLA SUBSTRIATA, *Moore sp.*

Fig. 4.—A partially preserved cast of the left valve.

SERPULA TRACHINUS, *Goldfuss?*

Fig. 5.—Portion of a tube partly weathered from the matrix.

Fig. 6.—Section of tube prepared for the microscope — $\times 2$.

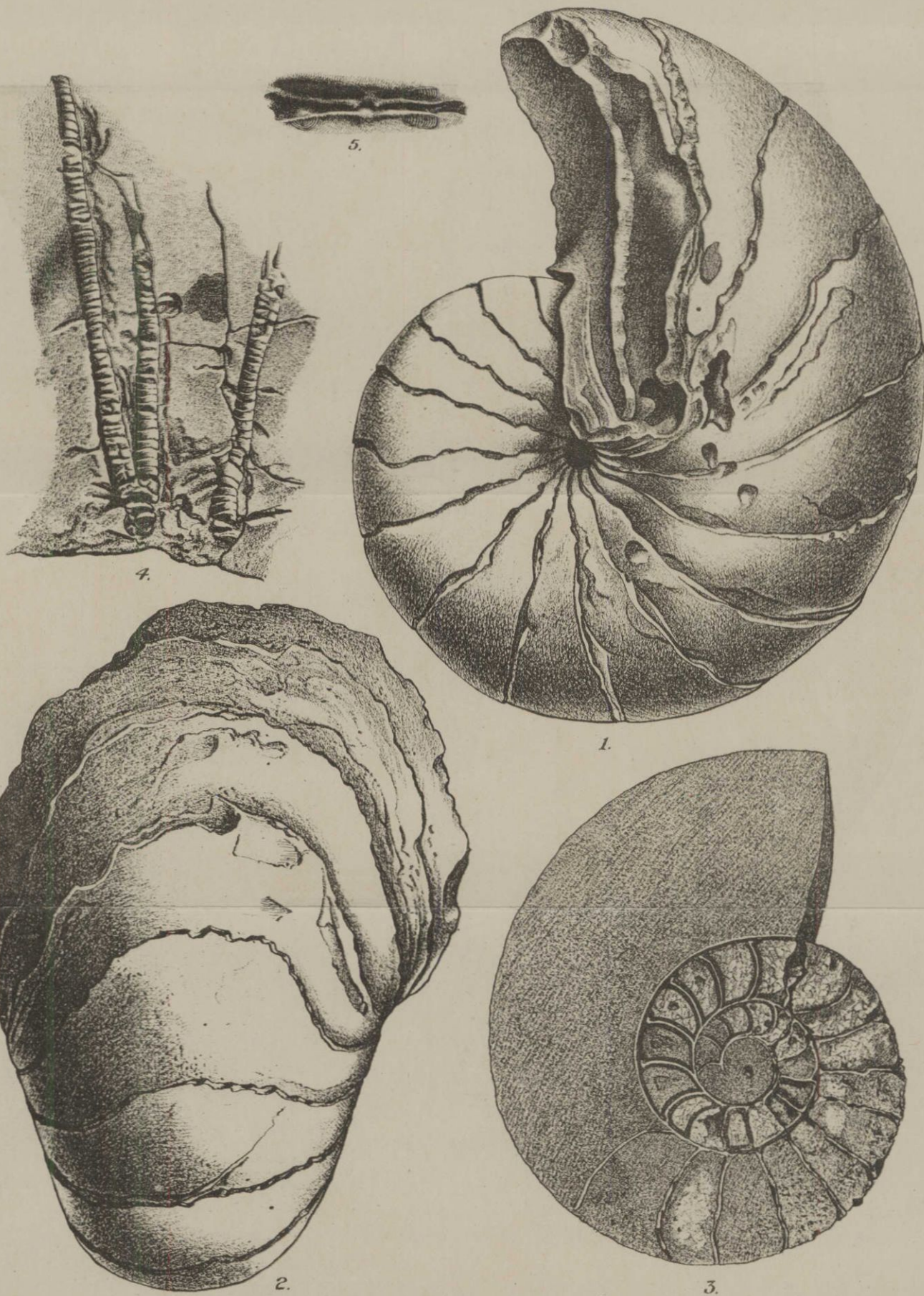
LUNULITES ABNORMALIS, *Eth. fil.*

Fig. 7.—Sub-cupuliform or slightly infundibuliform colony, with the zoëcia removed, and exhibiting the concave ribs (obverse) and perforations.

Fig. 8.—Casts of the zoëcia — $\times 3$.

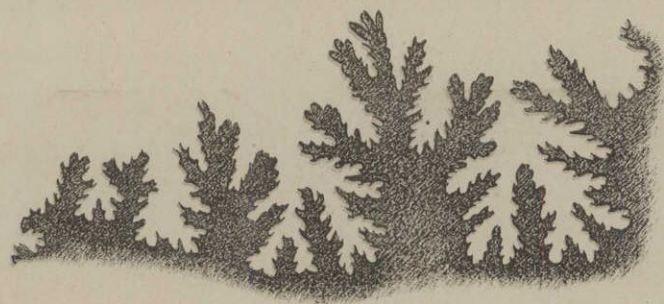
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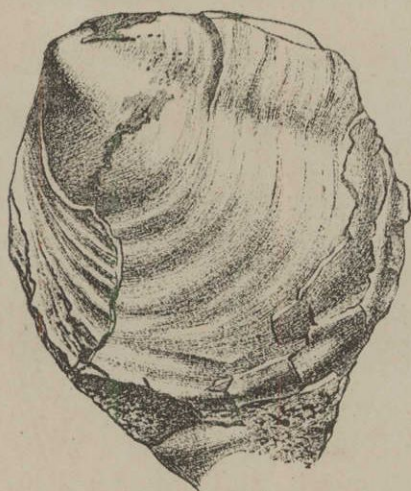




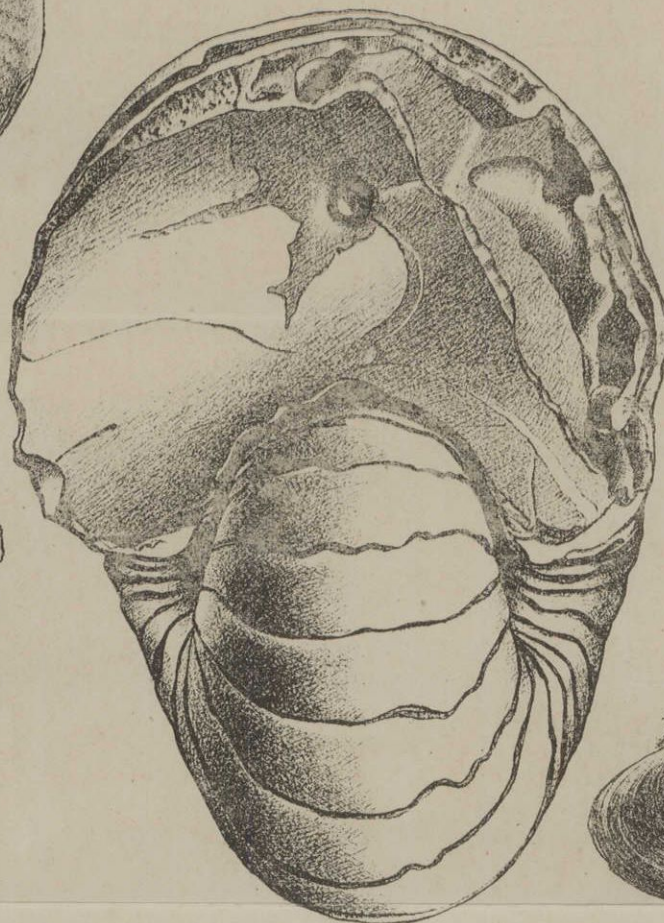
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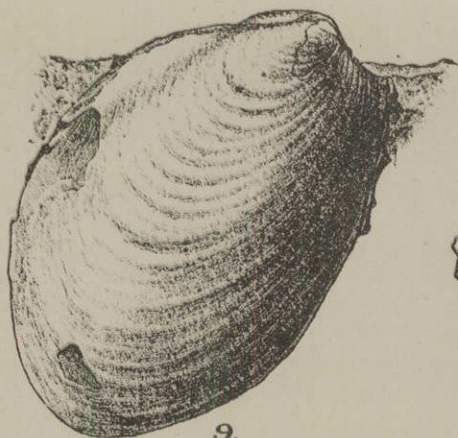
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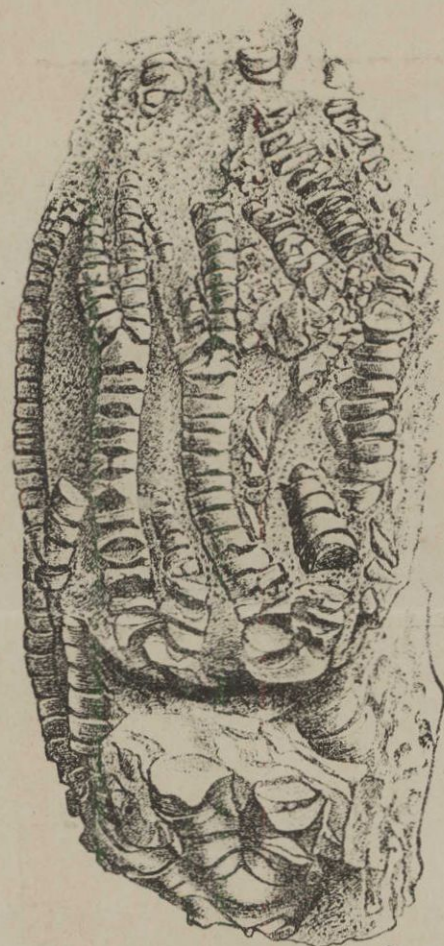
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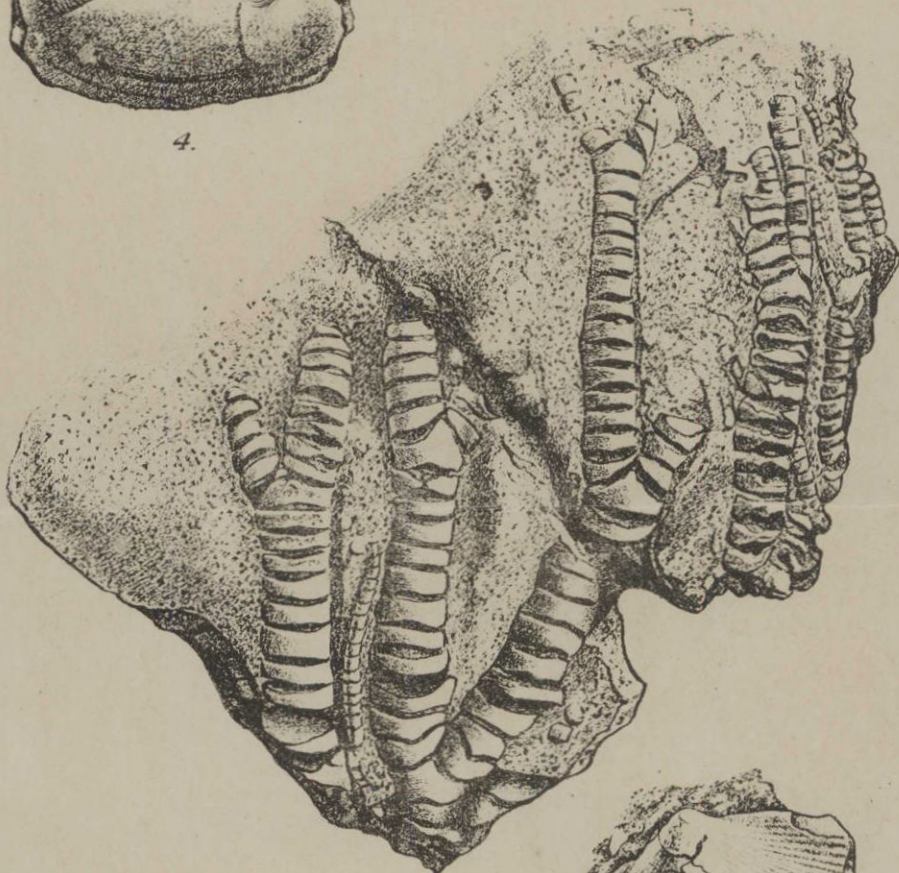
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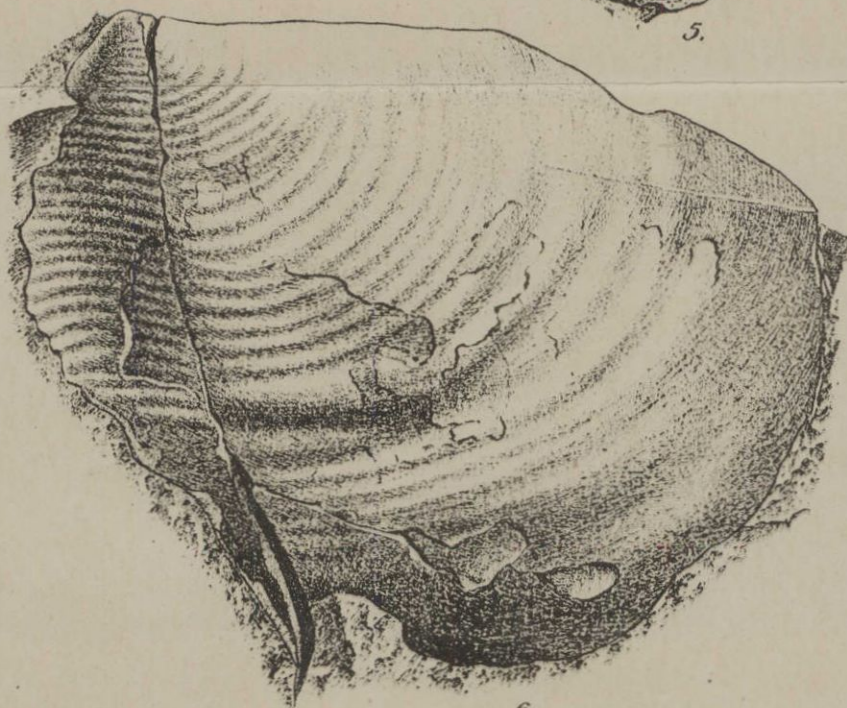
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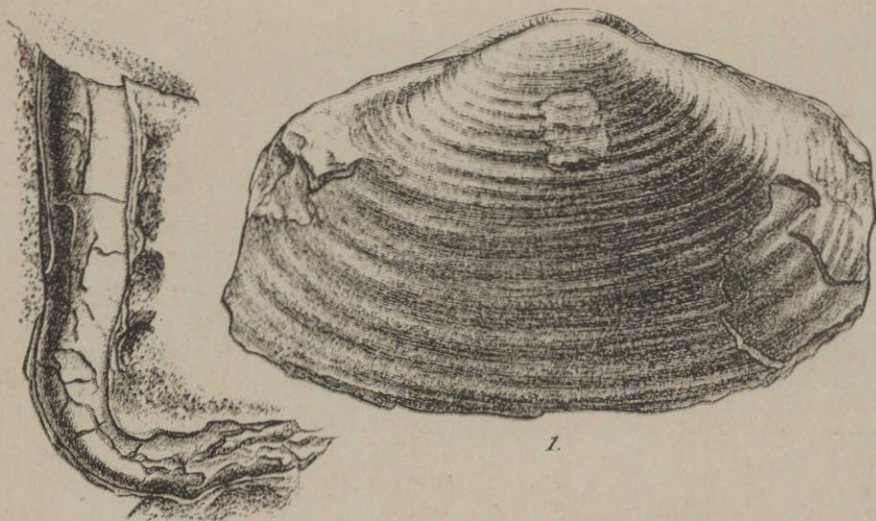
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