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LOWER CRETACEOUS FOSSILS FROM THE SOURCES OF
THE BARCOO, WARD AND NIVE RIVERS, SOUTH
CENTRAL QUEENSLAND.

PART I.—ANNELIDA, PELECYPODA AND
GASTEROPODA.

By. R. ETHERIDGE, JUNR., Curator.

(Plates lvii.-lxii.).

I.—INTRODUCTION.

The Trustees have acquired from time to time during the last few years, and through the liberality of Mr. H. W. Blomfield, a large suite of Queensland Cretaceous Fossils in various states of preservation. Many of these are well known forms, others species only partially described, and a few apparently new.

The whole series is representative of the Lower Cretaceous or "Rolling Downs Formation," and is from an area drained by head waters of the Barcoo, Ward, and Nive Rivers, source affluents of the Warrego River, itself a branch of the great Darling; unfortunately more precise localities were not recorded.

2.—DESCRIPTION OF THE FOSSILS.

COPROLITES.

(Plate lx., figs. 4 and 5).

Obs.—I have already referred¹ to certain bodies from the Point Charles Cretaceous deposit as probably coprolitic. In the present collection are two objects possessing the appearance of coprolites and very much larger than those from Point Charles. One of these is three inches long, and three quarters of an inch in transverse diameter. Both are fusiform in outline, tapering at both ends, but in one instance one of the ends is more acute than the other. The surface is roughened with faint irregular transverse

¹ Etheridge—Aust. Mus. Rec., v., 2, 1904, p. 114, pl. xiv., f. 1-3.

constrictions, but the tapering extremities are spiral as in ordinary Ichthyosaurian coprolites. Both of the specimens are convex on one side and faintly concave on the other.

A section prepared for the microscope from the fractured end of the incomplete specimen does not afford much information. The ground mass is limonitic with scattered quartz grains, but there are no fish scales or other minor exuvia.

ANNELIDA.

Genus *SPIRULÆA*, Bronn, 1827.

(Jahrb. Min., 1827, ii., p. 544).²

Obs.—Zittel tells³ us that Bronn selected the involute and free species *Serpula spirulæa*, Lamk., as the type of his genus *Spirulæa*. In the same year (1827), Defrance proposed⁴ the name *Rotularia* for this and other species, including both free and attached Tubicolar Annelids. As it is very convenient to accept even this artificial division of the genus *Serpula*, I adopt Bronn's term for those free involute species such as *S. spirulæa*. Tubes of this nature are met with in Oolitic, Cretaceous, and Tertiary strata.

SPIRULÆA GREGARIA, *sp. nov.*

(Plate lvii. ; Pl. lx., figs. 1-3).

Sp. Char.—Shell involute, concavo-sub-convex, from 5-15 millimetres in diameter, consisting of three or four whorls, terminating in a free tube of variable length; on the concave aspect the whorls are telescopic, and individually rounded, but on the sub-convex aspect each whorl is sloping and moreover less faintly convex. Periphery convex, neither ridged nor angled, section of tube round; sculpture fine and concentric, the free tube in some cases corrugated.

Obs.—A hand specimen of calcareous shale is crowded on both weathered surfaces with these involute tubes, in fact they chiefly compose the rock, associated with a few small Belemnites. The form is closely allied to *S. concava*, J. Sby.,⁵ from the Upper Greensand of the South of England. In some respects it also resembles *S. boqnoriensis*, Mantel,⁶ a Tertiary species, but

² *Fide* Bronn—Index Pal., Nomen., 1848, p. 1139.

³ Zittel—Handb., Pal., 1 Abth., i., 3, 1880, p. 564.

⁴ Defrance—Dict. Sci. Nat., xlvi., 1827, p. 321.

⁵ Sowerby—Min. Con., i., 1814, p. 125, pl. lvii., f. 1-5.

⁶ Sowerby—Min. Con. vi., 1828, p. 294, pl. dxvii., f. 1-3

possesses a less number of whorls and a more telescopic concave aspect.

PELECYPODA.

Genus PSEUDAVICULA, *Eth. fil.*, 1892.

(*Geol. Pal. Q'land, &c.*, 1892, p. 449).

Obs.—In my original description, lacking evidence to the contrary, I accepted Moore's statement⁷ that the type species (*Lucina anomala*, Moore) was equivalve. I have now material to show that the shell, I have for years rightly or wrongly named *Pseudavicula anomala*, Moore, sp., is decidedly inequivalve. The left valve is the more convex, the umbo higher than in the right, and slightly overhanging the cardinal margin, the umbo of the right valve is depressed and does not project above the cardinal margin. Later acquired specimens of *P. australis*, Moore, sp., lead to the belief that such is also the case in that species, as it certainly is in the one to follow.

PSEUDAVICULA PAPYRACEA, *sp. nov.*

Undetermined Bivalve, *Eth. fil.*, *Geol. Pal. Q'land, &c.*, 1892, p. 482, pl. xxi, f. 14.

Sp. Char.—Shell suborbicular, delicate and fragile, compressed, posteriorly alate, test very thin, papyraceous. Left valve convex in the umbonal region, with a sharply-pointed rather elevated umbo. Right valve more depressed than the left and the umbo inconspicuous. Dorsal margins on both sides straight, those anterior to the umbo obliquely inclined, those on the posterior straight; anterior ends small, the margins rounded; posterior alations small, flat, the margins rectangular. Sculpture of microscopic concentric lines.

Obs.—This very delicate shell, or fragments of it, occurs throughout the *Pachydomella* calcareous mudstone, of which so much of the collection is made up, in large numbers in association with the still more common *Pachydomella chutus*. In not a single instance have I seen the test complete in any one specimen, the usual conditions being that of internal casts, or the latter with fragments of test adhering, which must have been very thin and fragile.

⁷ Moore—*Quart. Journ. Geol. Soc.*, xxvi., 1870, p. 251.

The outline is that of my conception⁸ of *Pseudavicula anomala* Moore, sp., but out of the immense number of specimens and fragments not one has shown the characteristic sculpture of that species. Indeed, the only trace of ornament on the shell of *P. papyracea* is that of a few concentric, almost microscopic lines; the test is far too thin to carry the well marked decussate sculpture of *P. anomala*.

I believe it to be one of the undetermined valves figured at the reference above.

The specific name is in allusion to the delicate nature of the test. Figures will be given in a subsequent part.

Genus MACCOYELLA, *Eth. fil.*, 1892.

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

MACCOYELLA CORBIENSIS, *Moore, sp.*

(Plate lxi, figs. 1-6).

Avicula corbiensis, Moore, Quart. Journ. Geol. Soc., 1870, xxvi, p. 246, pl. xi, f. 7.

Maccoyella corbiensis, *Eth. fil.*, Mem. Geol. Survey N. S. Wales, Pal. No. 11, 1902, p. 21, pl. i, f. 6-10 (*for synonymy*).

Obs.—In the phenomenally rich calcereous shale containing the preceding species and *Pachydomella chutus* occur a large number of left valves agreeing in every particular with the corresponding valve of *M. corbiensis*, except in that of size. The maximum measurements of this species are approximately two and a quarter inches in length by two and a half inches in breadth, whereas in the specimens under review the average is about one half of the above; other than by this discrepancy, I am unable to differentiate between the respective specimens. In other words, those collected by Mr. Blomfield are *M. corbiensis* in miniature, and seem to represent a dwarf race of the species. Here and there, it is true, are examples with a greater breadth in proportion to length than in *M. corbiensis* proper, but this cannot be allowed to weigh in the face of more important features. Again, the posterior alation seems to be more highly developed in some examples than in larger individuals from other localities. One specimen fortunately, although worn externally, has the internal structure admirably preserved, particularly that of the articulus (Pl. lxi, fig. 1).

⁸ Etheridge—Mem. R. Soc. S. Austr., ii, 1, 1902, pl. ii, f. 1.

An interesting point occurs in connection with the relation of these shells to *Oxytoma rockwoodensis*, mihi.⁹ The shorter and broader examples closely resemble this, but the costæ in the latter are so much less in number. Before relegating *O. rockwoodensis* to the position of a synonym of *M. corbiensis* it will be necessary to see the interior of the former; should the two articuli agree, and my assumption that the present fossils are a dwarf race of the latter, it will be useful to distinguish them by using the name of the first in a varietal sense for the present fossils.

Genus AUCELLA, *Keyserling*, 1846.

(Reise in das Petschora Land, 1846, p. 297).

AUCELLA HUGHENDENENSIS, *Etheridge*.

(Plate lviii.; Pl. lxi., figs. 7-12).

Avicula hughendenensis, *Etheridge*, Quart. Journ. Geol. Soc., xxviii., 1872, p. 346, pl. xxv., f. 3.

Aucella hughendenensis, *Eth. fil.*, Mem. R. Soc. S. Austr., ii., 1, 1902, p. 14 (*for synonymy*).

Obs.—Foremost amongst the specimens of this collection is a very beautiful weathered example of this species, by far the finest group I have seen. Although the shell is now well known, other and smaller specimens reveal some points of structure not hitherto noticed.

The group (Pl. lviii.) displays to great perfection both valves, some in apposition. Amongst other notable points are the size attained, gradual fading away of the delicate costæ on the left valve from the umbonal region downwards, and the oblique fan-like outline of the right valve.

From the smaller specimens already referred to we learn that the small triangular auricle of the right valve was in some cases received (Pl. lxi., fig. 10) in an anterior inflection of the cardinal margin of the right valve. Another specimen displays the central and posterior portions of the cardinal margin of the left valve (Pl. lxi., fig. 11) as a broad sub-triangular concave area, but without a chondrophore; the cardinal margin of the right valve posterior to the umbo is thickened, but without forming a defined area. Another very interesting fact in the right valve is the delicate

⁹ *Etheridge*—*Geol. Pal. Q'land, etc.*, 1892, p. 448, pl. xxiv., f. 15.

crenulation of the lower margin of the auricle, and the concave dorsal margin of the valve opposite to it (Pl. lxi., fig. 7); this crenulation arises from a rugosity of the concentric laminae of the surface at those particular points.

On comparing the articulus of *A. hughendenensis* with that of *Maccoyella* we notice the absence of a chondrophoral button in the right valve, nor so far as I know, has the blunt tooth said to exist in the right valve of *Aucella* been seen in an Australian specimen.

Genus MODIOLA, Lamarck, 1799.

(Mèm. Soc. Hist. Nat. Paris, 1799, p. 89).

MODIOLA DUNLOPENSIS, Eth. fil.

(Plate lx., fig. 6).

Modiola dunlopensis, Eth. fil., Mem. Geol. Survey N. S. Wales, Pal. 11, 1902, p. 23, pl. v., f. 4 and 5, pl. vi., f. 1 and 2, pl. vii., f. 1.

Obs.—A single specimen is present, rather more than the posterior third of the conjoined valves. It is the first occurrence of the species in Queensland known to me.

Genus TRIGONIA, Bruguière, 1789.

(Encycl. Method., i., 1789, pl. xiv.).

TRIGONIA CINCTUTA, Eth. fil.

(Plate lx., fig. 9).

Trigonia cinctuta, Eth. fil., Mem. Roy. Soc. S. Australia, ii., pt. 1., 1902, p. 28, pl. iv., f. 4-6, (?) 7.

Obs.—This is represented by an external impression of the antero-posterior two thirds of the united valves. The fluctuating costae are well shown with large nodes along the margins of the cinctures; the latter are broad. This is the first occasion on which *C. cinctuta* has been met with outside the Lower Cretaceous of South Australia.

Genus GRAMMATODON, Meek and Worthen, 1858.

(Proc. Acad. Nat. Sci. Philad., 1858, p. 419).

GRAMMATODON (?) DAINTREEI, sp. nov.

(Plate lx., figs. 7 and 8).

Sp. Char.—Shell longitudinally oblong, equivalve. Valves tumid, particularly in the umbonal regions which are traversed

by faint, posteriorly-directed cinctures, and separated from the remainder of the posterior ends by curved, rounded, but at the same time prominent diagonal ridges. Cardinal margins wide, but hardly as wide as the valves; umbos tumid, depressed, and faintly prosogyrate, quite anterior but not terminal; area long and narrow, with straight ligamental furrows; hinge plate narrow, with four and perhaps five short, oblique, inwardly directed anterior denticles, and five long upwardly and outwardly directed posterior denticles, the whole of them transversely striate. Adductor scars faint. Ventral margins gently rounded. Anterior ends short, steep, the margins well rounded but not oblique; posterior ends forming quite two-thirds of the valves, at first tumid, but beyond the diagonal ridges flattened and alate, the margins obliquely truncate above, and rounded below. Sculpture of concentric lines at irregular distances apart and of varying strength, crossed by fine radiating costæ, alternately larger and smaller producing an ill-defined cancellation; the costæ in and around the cincture are stronger than the remainder.

Obs.—I employ the name *Grammatodon* as originally intended by Messrs. Meek and Worthen, and as distinct from their *Parallelodon*.¹⁰ At the same time I do not feel entirely satisfied that the present shell is a *Grammatodon* in consequence of the oblique posterior teeth rather than the latter parallel to the cardinal margins, and also from the fact that all the denticles are transversely striate. In the possession of this striation it resembles a Cretaceous genus of Conrad's *Polynema*.

In some respects *G. (?) daintreei* resembles a previously described *Barbatia*-like Arc—*Cucullæa hendersoni*, mihi,¹¹ from the Lower Cretaceous of the Tambo District, Queensland, which, I regret, I am unable to compare with it. In the species mentioned the umbos are so much more central, and without umbonal cinctures that I think the two shells can hardly be identical.

G. (?) daintreei is associated with *Aucella hughendenensis*. Named in honour of the late Richard Daintree, C.M.G., a former Government Geologist of and Agent-General for Queensland.

¹⁰ *Parallelodon*, M. and W. = *Macrodon*, Lycett (*non* Muller), *Macrodon*, Beushausen, and *Beushausenia*, Cossman.

¹¹ Etheridge—Geol. Pal. Q'land, etc., 1892, p. 468, pl. xxvi., f. 2 and 3.

Genus CORBULA (*Bruguière*), *Lamarck*, 1801.

(*Syst. Anim. s. Vert.*, 1801, p. 137).

CORBULA SUPER-CONCHA, *sp. nov.*

Sp. Char.—Shell inequilaterally subdeltoid, tumid, with well-marked posterior production; slightly inequivalve. Valves very tumid and projecting in the umbonal regions, with large and highly pronounced epiostraca¹²; articulus unknown; cardinal margins strongly triangular, but without a defined escutcheon; umbos prosogyrate. Anterior ends of less width than the posterior, the margins broadly rounded; anterior slope nearly straight walled. Posterior ends moderately produced, nasute but not rostrate or truncate; posterior slope pronounced, flattened, or even a little concave, bounded by a curved diagonal ridge. Ventral margins on the anterior sides obtusely rounded, on the posterior curved obliquely upwards. Sculpture concentric and fine, both valves similar.

Obs.—Nothing approaching this well-marked shell has been so far as I can ascertain, described from our Cretaceous rocks. It is referred to *Corbula* purely on outward characters.

One of the most marked features is the very pronounced umbonal and infra-umbonal epiostracum (as I term it) in both valves, marking growth stages. This is a pronounced feature in many *Corbula*, although not in all, but here these stages are important and appear to be almost a specific character. The depth to which the first stage extends is variable, but not infrequently occupies at least half if not more of the length of a valve. The sculpture is fine and linear, and without concentric corrugations as in some species.

I have failed to find any near ally in Cretaceous rocks, although were *C. traskii*, Gabb¹³, less rostrate, it would not be unlike the present shell in outline; a similar remark also applies to *C. buckmani*, Buckman¹⁴, an Oolitic species.

Figures will be given in a subsequent part.

¹² I employ this term to signify that most marked of growth stages looking like a shell upon a shell.

¹³ Gabb—Report Geol. Survey California, i, 4, 1864, p. 149, pl. xxii., f. 121, 121a.

¹⁴ Lycett—Suppl. Mon. Moll. Gt. Oolite, etc., 1863, pl. xxxvii., f. 8.

Genus PACHYDOMELLA,¹⁵ *gen. nov.*

Obs.—The single species comprised in this genus, although diminutive, is a most important one geologically. Within the area from which Mr. Bloomfield's collection was made, it evidently marks a well defined horizon, and occurs in countless numbers. Had it not been for this, I would not have ventured to describe it from the very simple fact that I am unable to give any definite generic characters except the edentulous condition. The slab figured on Pl. lix., will afford some idea of the enormous numbers in which this little shell occurs. Furthermore, its external characters are such that it can be easily recognized in the field, and this with its highly gregarious nature will always afford aid to the field geologist.

Notwithstanding its plentitude and in a comparative sense its thick test, I have been unable to observe either the adductor scars or pallial line; for all I can see to the contrary the latter is entire. Under these circumstances the following description must serve both as a generic and specific definition. The name must be regarded for the present, simply as one of convenience.

PACHYDOMELLA CHUTUS¹⁶, *sp. nov.*

(Plate lxii., figs. 4-8)

Sp. Char.—Shell small, transversely ovate, trigonal, very slightly inequilateral; test thick. Valves convex, the convexity increased by one or more epiostraca, the umbonal one usually large and projecting, when more than one on each valve, they overlap from above downwards. Cardinal margins slightly angular; neither lunule nor escutcheon; articulus edentulous; umbos prosogyrate, small. Anterior ends slightly less than the posterior, the margins of the former rounded, those of the latter more obtuse; posterior slope present, but ill defined. Ventral margins widely semi-circular. Sculpture concentric and delicate.

Obs.—I am not able to suggest even an alliance for this gregarious mollusc. The name *Pachydomella* is not to be taken as thereby indicating a relation to the Permo-Carboniferous genus *Pachydomus*, it is given simply in allusion to the thick test and small size, and the specific name similarly refers to the prominent overlapping epiostraca, that form so marked a feature on each

¹⁵ πᾶχυς—thick, δόμος—house.

¹⁶ χυτός—heaped up.

valve. At first sight the general appearance reminds one of the *Corbula* group, but any alliance therewith is at once discounted by the edentulous nature of the articulus.

I have examined a large number of internal casts, but only with negative results; all the internal features of the test must have been very weak.

In view of future research, I would like to point out that Moore described a small bivalve as *Mactra trigonalis*¹⁷, and said a thin slab from the Nive River Downs "appears to be almost composed of this little shell." Moore's figure was drawn from a very poor specimen, that is certain. It is equally clear the figure in question, as it stands, does not represent the present species. At the same time allowing for Moore's very brief descriptions of his Australian shells, and the often imperfect material figured, there is the possibility, both being gregarious, that *M. trigonalis* and *C. chutus* are one and the same; on the other hand the test of the latter is not thin, and supposing them to ultimately prove identical, they are not a *Mactra*.

Genus CYTHEREA, Lamark, 1806.

(Ann. Mus. Hist. Nat. Paris, 1806, vii., p. 132).

CYTHEREA (?) MOOREI, *Eth. fil.*

(Plate lxii., figs. 1-3).

Cyprina (?) sp., Hudleston, Geol. Mag., i., 1884, p. 341, pl. xi., f. 7a and b.

Cytherea (*Cyprina*?) *Moorei*, *Eth. fil.*, Geol. Pal. Q'land, etc., 1892, p. 474, pl. xxxiv., f. 12 and 13.

Sp. Char.—Shell ovate, width and length nearly equal, inequality of the sides well marked. Valves tumid in the umbonal regions frequently through the presence of well marked epiostraca; compressed ventrally. Cardinal margins sharply angular; lunule widely diamond or lozenge-shaped; escutcheon undefined. Anterior and posterior ends very unequal, the latter much the larger, occupying at least two-thirds of the shell width, and slightly obtusely produced; anterior and ventral margins are well and regularly rounded, but the posterior is more sharply rounded than the anterior. Sculpture concentric, of very regular grooves with flat interspaces.

¹⁷ Moore—Quart. Journ. Geol. Soc., xxvi., 1870, p. 252, pl. xiv., f. 6.]

Obs.—The imperfect shell figured by Mr. Hudleston from South Australia, and to which I applied the name of *Cytherea moorei* is the only described bivalve with any relation to the present form. There are numerous specimens in the collection, smaller certainly than that represented by Hudleston's figure, but not otherwise sufficiently differentiated to warrant separation.

I know not what to make of *Astarte wollumbillaensis*, Moore,¹⁸ the figure portrays so imperfect a specimen, but the sculpture is certainly like that of the present fossils.

GASTEROPODA.

Genus CANCELLARIA, *Lamarck*, 1799.

(Mèm. Soc. Hist. Nat. Paris, 1799).

CANCELLARIA (?) TERRAREGINENSIS, *sp. nov.*

(Plate lx., fig. 11).

Sp. Char.—Shell small, ventricose-turbinate, whorls four, sharply differentiated from one another in size, and all more or less shoulder-like around the sutures. Body whorl ventricose, greatly exceeding the penultimate whorl in size, and rendered [quinqu]-angular by several [five] transverse keels, crossed by prominent equidistant costæ extending from the suture across the two first keels only, or perhaps nearly as far as the third; antepenultimate whorl with certainly three and perhaps four keels.

Obs.—The mouth is unknown to me and the tentative reference to *Cancellaria* is based only on form and sculpture.

I have already described¹⁹ the body whorl of a univalve (*Delphinula* (?) *sturti*) from the Lower Cretaceous of South Australia with distant spiral keels, but without longitudinal costæ forming a kind of coronation; the actual relation of the two has yet to be shown.

Genus VANIKOROPSIS, *Meek*, 1876.

(Report U.S. Geol. Survey Territories (Hayden's), ix., 1876, p. 351).

VANIKOROPSIS (?) STUARTI, *Eth. fil*

(Plate lxii., figs. 9-13).

Vanikoropsis (?) *Stuarti*, *Eth. fil.*, Mem. R. Soc. S. Austr., ii. 1, 1902, p. 42, pl. vi., f. 18-20.

¹⁸ Moore—Quart. Journ. Geol. Soc., xxvi., 1870, p. 250, pl. xii., f. 12.

¹⁹ Etheridge—Mem. R. Soc. S. Austr., ii., 1, 1902, p. 41, pl. vi., f. 21 and 22.

Sp. Char.—Shell more or less naticiform, sub-globose; spire slightly elevated; test thick. Whorls four, the posterior globose and straight walled; sutures channeled; body whorl much exceeding the others in size, inflated, convex above; inner lip reflected and slightly channeled or grooved. Sculpture when unworn of spiral, equidistant slightly wavy ridges separated by wider valleys, and the whole crossed by a variable number of oblique costæ, which on the posterior whorls pass from suture to suture, but on the body whorl are confined to the posterior convex surface only; the points of intersection are minutely nodose, whilst the crossing of these two systems of ridges converts the valleys into a series of small quadrangular spaces. When weathered the minute nodes become worn off leaving small depressions, and these, added to the already mentioned quadrangular spaces give to this superinduced sculpture, a highly ornate appearance.

Obs.—This little naticiform shell is by no means uncommon in the Pachydomella calcareous mudstone, although this is, to me, its first occurrence in the northern extension of our Lower Cretaceous.

The costæ appear to be very variable in number, indeed one specimen is provided with so few as to almost separate it from the remainder. When completely divested of the sculpture layers and the mouth imperfect, it is almost impossible to distinguish *V. (?) stuarti* from *Pseudamaura variabilis*, Moore, sp.²⁰

Genus ANISOMYON, *Meek and Hayden*, 1860.

(*Am. Journ. Sci.*, (2), xxix., 1860, p. 35).

ANISOMYON (?) DEPRESSUS, *sp. nov.*

(Plate lx., figs. 13 and 14).

Sp. Char.—Shell ovate-elliptical, patelliform, depressed, the ends not equally broad; lateral margins sub-parallel, converging slightly towards the posterior (?); apex depressed, obtuse, nearly central; both anterior and posterior slopes convex, the former (?) the more abrupt.

Obs.—I take the present opportunity of figuring a shell not comprised in the Blomfield collection, because although in a poor condition it entirely differs from both the Patelliform shells previously described. The name *Anisomyon* is applied to it solely

²⁰ Etheridge—*Mem. Geol. Survey N.S.Wales*, Pal. No. 11, 1902, p. 40.

from its resemblance to some of the American species so referred by Meek and Hayden, particularly *A. subovatus*, M. and H.,²¹ as I have not seen the peculiar muscle scar typical of the genus.

The specimen is much exfoliated hence the sculpture is unknown, but there is no trace of radii as in *Siphonaria samwelli*, Eth. fil.²² It may be distinguished from the shell termed *Acmea* (?) *monswoodensis*²³ by me, to which it is much more nearly allied by the outline and relative size of its parts.

Loc.—Three miles north-west of Kensington Downs Homestead, Kensington Downs, near Longreach, Queensland (*A. J. Erwen*).

Genus ODONTOSTOMIA, *Fleming*, 1828.

(*Hist. Brit. Animals*, 1828, p. 310).

ODONTOSTOMIA (?) CRETACEA, *sp. nov.*

(Plate lx., figs. 10, 10a).

Sp. Char.—Shell robust-conoid, spire short. Whorls three and a heterostrophic apex; body whorl inclined to be globose, the outline rounded; penultimate and antipenultimate whorls almost straight walled; heterostrophic apex globose, apparently of more than one whorl, lying at right angles to the axis of the adult shell in which it is slightly immersed. Sculpture of delicate revolving lines crossed by equally fine straight transverse lines or costæ producing a fine cancellation.

Obs.—This is referred to *Odontostomia* with reservation as the mouth has not been seen, but the distinct heterostrophic apex clearly points to this genus or one of its close allies. The group of Mollusca to which this shell belongs appears to be little known in the Cretaceous; Stoliczka has described one species but it is quite distinct from *O. (?) cretacea*.

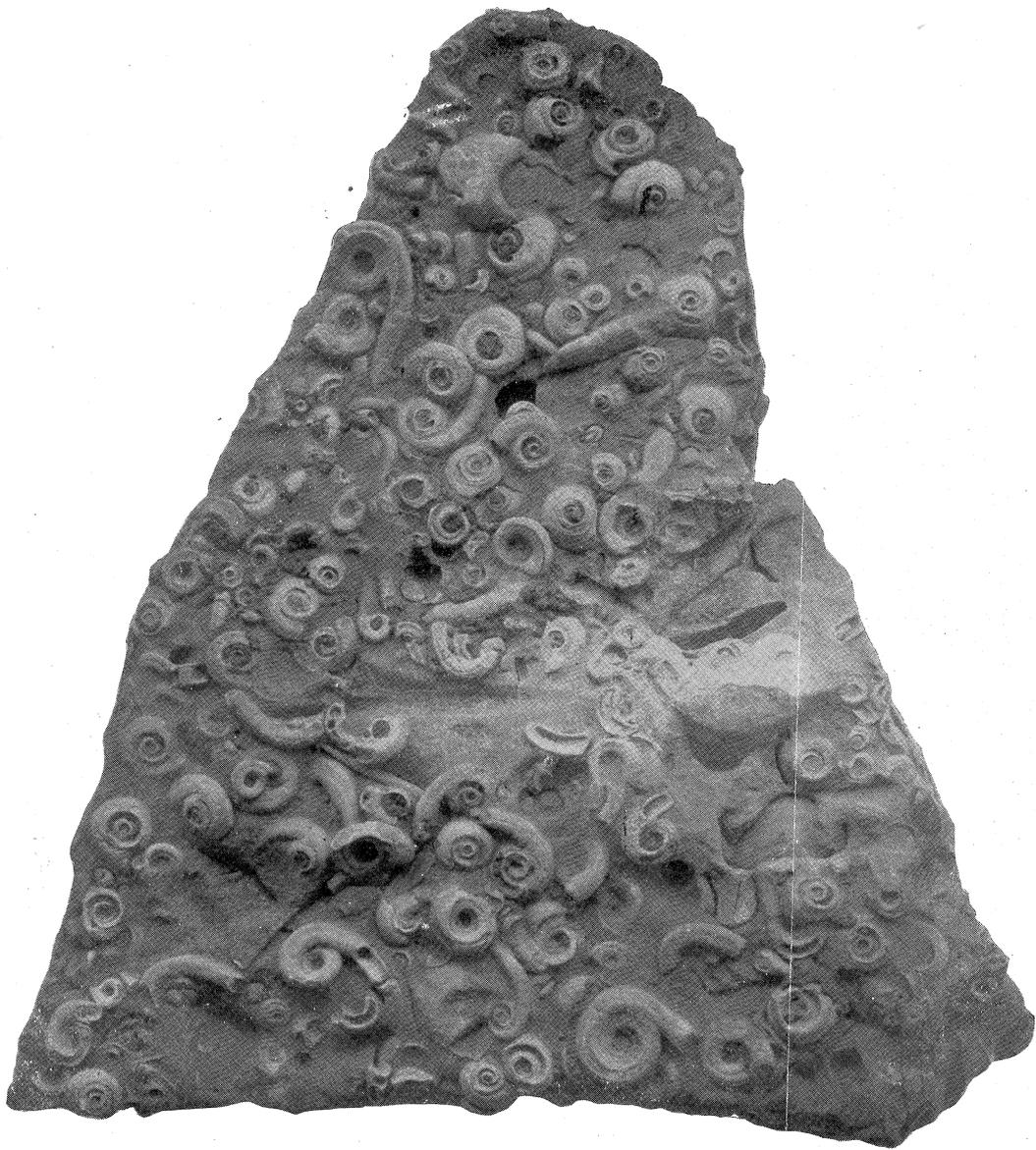
²¹ Meek and Hayden—Report U. S. Geol. Survey Territories (Hayden's), ix., 1876, p. 291, pl. xviii., f. 5d and 6.

²² Etheridge—Geol. Pal. Q'land, etc., 1892, p. 573, pl. xlii., f. 9.

²³ Etheridge—Rec. Austr. Mus., v., 4, 1904, p. 251, pl. xxvii., f. 5-7.

EXPLANATION OF PLATE LVII.

Slab of calcareous shale covered with *Spirulæa gregaria*, Eth. fl.



H. BARNES, Junr., photo.
Austr. Mus.

EXPLANATION OF PLATE LVIII.

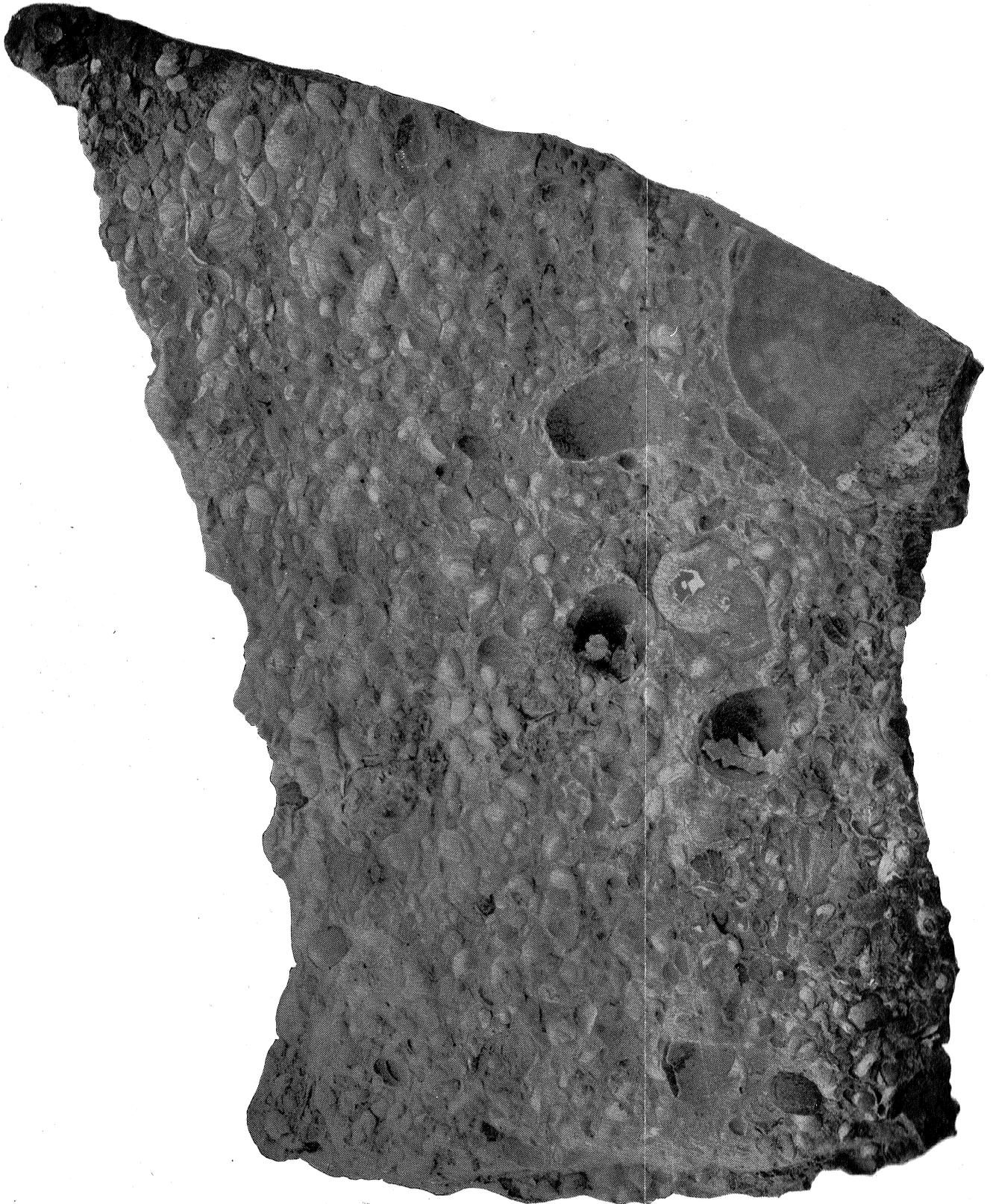
Group of *Aucella hughendenensis*, Eth.



H. BARNES, Junr., photo.,
Austr. Mus.

EXPLANATION OF PLATE LIX.

Slab of *Pachydomella* calcareous shale exhibiting the profusion in which
Pachydomella chutus, Eth. fil., occurs.



H. BARNES, Junr., photo.,
Austr. Mus.

EXPLANATION OF PLATE LX.

SPIRULÆA CRETACEA, *Eth. fil.*

- Fig. 1. Two tubes in contiguity, one extended— $\times 2$.
,, 2. Another example, concave aspect— $\times 2$.
,, 3. A third specimen, concave aspect, with the free tube fractured, and a telescopic umbilicus— $\times 2$.

COPROLITES.

- ,, 4. Fusiform body with a more or less spiral end.
,, 5. Another example with the termination more acute.

MODIOLA DUNLOPENSIS, *Eth. fil.*

- ,, 6. Rather more than the posterior third of the conjoined valves.

GRAMMATODON (?) DAINTREEI, *Eth. fil.*

- ,, 7. The two valves, one testaceous, the other an internal cast— $\times 3$.
,, 8. Interior of the valve removed from the cast in Fig 7— $\times 3$.

TRIGONIA CINCTUTA, *Eth. fil.*

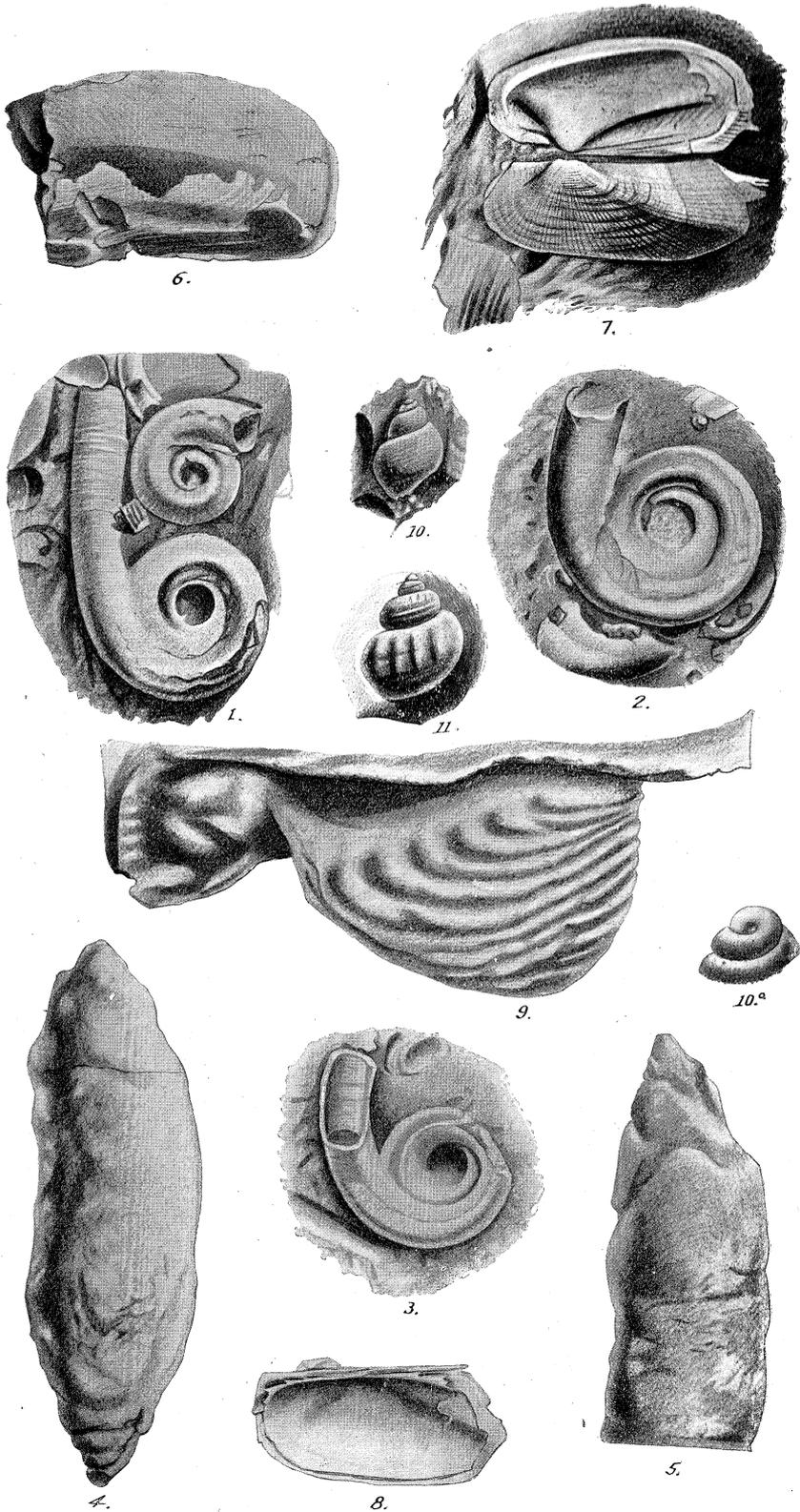
- ,, 9. Cast of portion of the exterior of a right valve taken from an impression in calcareous shale.

ODONTOSTOMIA (?) CRETACEA, *Eth. fil.*

- ,, 10. Three whorls and a heterostrophic apex; the delicate decussate sculpture on the body whorl is faintly visible— $\times 4$.
,, 10a. The heterostrophic apex, much enlarged.

CANCELLARIA (?) TERRAREGINENSIS, *Eth. fil.*

- ,, 11. Four whorls, the body whorl with transverse keels and costæ— $\times 5$.



F. R. LEGGATT, del.

EXPLANATION OF PLATE LXI.

MACCOYELLA CORBIENSIS, *Moore, sp. (?)*.

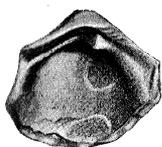
- Fig. 1. Articululus of the left valve.
" 2. Portion of a left valve with posterior auricle.
" 3. Left valve, one of the largest specimens, with costæ.
" 4. A similar left valve.
" 5. A much broader example of a left valve, with posterior alation approaching *Oxytoma rockwoodensis*, Eth. fil., in outline.
" 6. Longitudinally elongated individual with well preserved sculpture.

AUCELLA HUGHENDENENSIS, *Etheridge*.

- " 7. Portion of the united valves. The auricle of the right valve and the anterior dorsal margin of the latter are seen to be crenulated— $\times 2$.
" 8. Left valve of a typical specimen.
" 9. Group of young individuals on the weathered surface of a piece of impure limestone.
" 10. The valves in apposition showing the auricle of the right valve received in an anterior inflection of the cardinal margin— $\times 2$.
" 11. Portion of valves in apposition but exhibiting the area of the left valve— $\times 3$.
" 12. The specimen of which Fig. 11 is a partial enlargement— $\times 2$.

ANISOMYON (?) DEPRESSUS, *Eth. fil.*

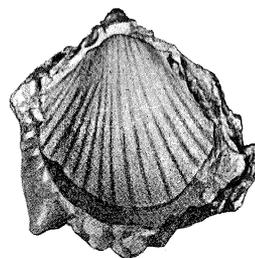
- " 13. Lateral view.
" 14. Apical view.



1.



2.



3.



4.



7.



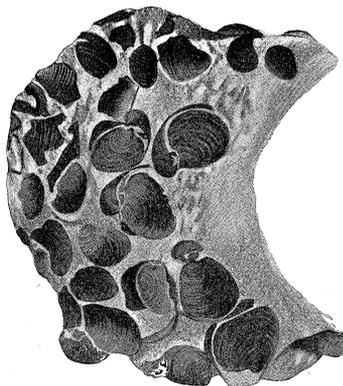
13.



14.



5.



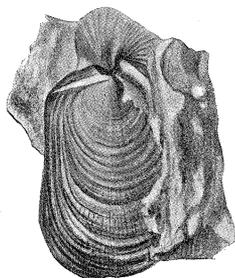
9.



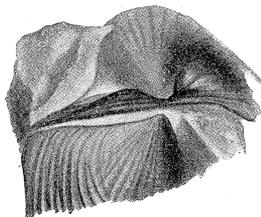
6.



8.



12



11



10.

EXPLANATION OF PLATE LXII.

CYTHEREA (?) MOOREI, *Eth. fil.*

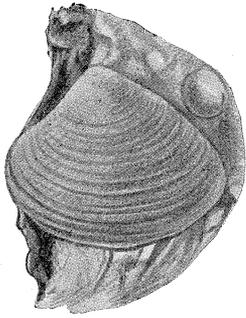
- Fig. 1. A left valve— $\times 2$.
,, 2. Portion of the anterior end of another specimen exhibiting the lunule— $\times 3$.
,, 3. A right valve with an epiostracum and characteristic sculpture— $\times 2$.

PACHYDOMELLA CHUTUS, *Eth. fil.*

- ,, 4. A left valve, a characteristic specimen— $\times 3$.
,, 5. Another left valve with well marked epiostracum— $\times 3$.
,, 6. A similar specimen to Fig. 5— $\times 3$.
,, 7. An internal cast of the valves in apposition— $\times 3$.
,, 8. A testaceous example with the valves in apposition— $\times 3$.

VANIKOROPSIS (?) STUARTI, *Eth. fil.*

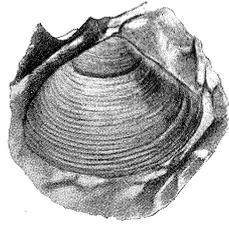
- ,, 9. A specimen with a limited number of oblique costæ, the intersection of the latter and the spiral lines nodose— $\times 2$.
,, 10. An example in which the sculpture is very regular, but the depressions caused by the wearing off of the nodes commencing to show below the suture on the body-whorl— $\times 3$.
,, 11. Portion of the characteristic sculpture highly magnified.
,, 12. A specimen resembling Fig. 10— $\times 2$.
,, 13. Portion of the mouth, imperfect— $\times 2$.



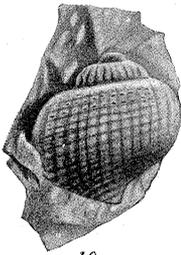
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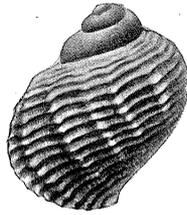
2.



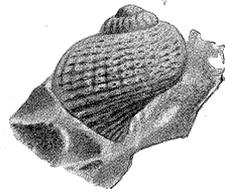
3.



10.



9.



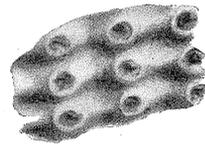
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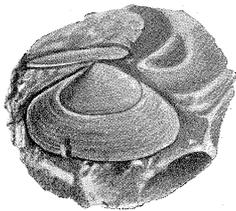
4.



13.



11.



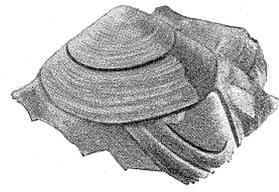
5.



7.



8.



6.