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MOLLUSCA FROM ONE HUNDRED FATHOMS,
SEVEN MILES EAST OF CAPE PILLAR, TASMANIA.

By C. HEDLEY, Conchologist, and W. L. MAY.

(Plates xxii-xxv.)

No vessel equipped for deep sea investigation like the "Challenger" has ever explored the Tasmanian coast. The nearest point where a deep sea dredge has been hauled is off Twofold Bay, about four hundred miles from the scene of our work. Hitherto Tasmanian naturalists have confined their attention to shallow and sheltered waters.

To search further and deeper the writers engaged the "Sea-Bird," a serviceable steamer of twenty-five tons, and spent some hours of December 17th and 18th, 1907, in dredging around a spot seven miles east of Cape Pillar in an estimated depth of one hundred fathoms. We enjoyed the company and assistance of Dr. J. C. Elkington during the cruise. The weather was rough and unpleasant, and the success attained was due to the skilful management of the apparatus by the ship's engineer, Mr. Gulliver. We employed the bucket dredge, and for the final haul trailed a dredge behind the bucket with excellent results.

The submarine slope of the land is here extremely steep. The contour has not been fully developed by soundings, but the few scattered observations indicate that a depth of three hundred and forty-three fathoms is reached about eight miles from the land, descending to over a thousand fathoms at twelve miles and the level floor of the abyss, two thousand two hundred and seventy five fathoms beneath the surface, is attained at a distance of seventy miles.

A remarkable feature was the total absence of mud in the area examined. The hard ground diminished the proportion of bivalves to gasteropods. The sea-floor was shown by the dredge to be carpeted by a dense growth of tunicates, alcyonaria, sponges, bryozoa, etc., on a firm bottom of sand, rolled pebbles, and a conglomerate of recent shells. The rock was hard enough to dint the lip of the bucket. Some specimens of the siliceous pebbles, quartz, chert, jasper, etc., which Dr. C. Anderson kindly weighed for us, were 1.092, 0.774, and 0.509 grams respectively. The coral *Flabellum australe*, Moseley, was abundant, and reached a large size. While we worked, a strong current drifted us north-

wards, and we were led to believe from the fauna and composition of the sea-floor that this powerful current swept the bottom clear of mud, even at a depth of a hundred fathoms.

We have here increased the known marine mollusca of Tasmania by one-eighth. Probably so large a proportion will never again be added in one act. Including fragments, illegible or undetermined forms, the collection amounts to about two hundred and eighty species, of which we record two hundred and fourteen. Representatives of groups other than the mollusca have been handed to specialists, and it is hoped that further reports may appear.

Under the giant cliffs of Tasman Island have sailed so many great captains and so many famous naturalists, that the spot has revered memories to inspire the worker of to-day. For here in 1642 passed Abel Janz Tasman in the "Heemskerch" and "Zeehan." After a long interval the ill-fated Marion du Fresne followed him in 1772. Five years late came Cook in the "Resolution." The "Recherche" bore D'Entrecasteaux with La Billardière in 1792. And Péron with Freycinet under Baudin voyaged in the "Géographe" and "Naturaliste" in 1802. Past here again, in 1826, Quoy and Gaimard travelled in the "Astrolabe" under Dumont D'Urville. From the deck of the "Beagle" Darwin saw the huge basalt columns in 1836. Four years later his friend Hooker, under Ross, passed in the "Erebus" and "Terror."

The following are the species identified. A star (*) indicates that the species has not been recorded from Tasmania:—

- **Scissurella australis*, Hedley.
- Schismope atkinsoni*, Tenison Woods
- " *pulchra*, Petterd.
- **Emarginula superba*, Hedley and Petterd.
- " *candida*, A. Adams.
- Fissurella concatenata*, Crosse and Fischer.
- **Gibbula galbina*, Hedley and May.
- **Monilea philippensis*, Watson.
- Cantharidus irisodontes*, Quoy and Gaimard.
- **Calliostoma columnarium*, Hedley and May.
- " *incertum*, Reeve.
- " *allporti*, Tenison Woods.
- * " *retiarium*, Hedley and May.
- " *hedleyi*, Pritchard and Gatliff
- " *legrandi*, Tenison Woods.
- Astele subcarinatum*, Swainson.
- **Basilissa niceterium*, Hedley and May

- Euchelus scabriusculus*, Angas.
Cirsonella weldii, Tenison Woods.
Cyclostrema crebrisculptum, Tate.
 „ *micron*, Tenison Woods.
 „ *inscriptum*, Tate.
 „ *charopa*, Tate.
 „ *angeli*, Tate.
 „ *porcellanum*, Tate and May
Liotia annulata, Tenison Woods.
 „ *josephi*, Tenison Woods.
 * „ *petalifera*, Hedley and May.
 * „ *mayana*, Tate.
Acmæa flammea, Quoy and Gaimard.
 „ *calamus*, Crosse and Fischer.
 * *Phenacolepas calva*, Verco.
Cocculina tasmanica, Pilsbry.
Rissoa unilirata, Tenison Woods.
 * „ *columnaria*, Hedley and May.
 „ *olivacea*, Frauenfeld.
 „ *layardi*, Petterd.
 „ *dubitabilis* Tate.
 „ *approxima*, Petterd.
 „ *cheilostoma*, Tenison Woods.
 „ *tenisoni*, Tate.
 „ *tasmanica*, Tenison Woods.
 * „ *incompleta*, Hedley.
 * *Rissoina lutea*, Hedley and May.
 * „ *fausta*, Hedley and May.
 „ *gertrudis*, Tenison Woods.
 * *Capulus devotus*, Hedley.
Cerithiopsis semilaevis, Tenison Woods.
 „ *turbonilloides*, Tenison Woods.
 „ *crocea*, Angas.
 „ *purpurea*, Angas.
Ataxocerithium serotinum, A. Adams.
Triphora granifera, Brazier.
 „ *angasi*, Crosse and Fischer.
 „ *tasmanica*, Tenison Woods.
 „ *fasciata*, Tenison Woods.
 * *Turritella smithiana*, Donald.
 * „ *cpulenta*, Hedley.
 „ *subsquamosa*, Dunker.
 „ *accisa*, Watson.
 * *Epitonium morchi*, Angas.
 * „ *validum*, Verco.

- **Crossea carinata*, Hedley.
 ,, *cancellata*, Tenison Woods.
 **Sirius badius*, Tenison Woods.
Siliquaria weldii, Tenison Woods.
 **Vermicularia nodosa*, Hedley.
 * ,, *flava*, Verco.
 **Eulima munita*, Hedley.
Odostomia metcalfei, Pritchard and Gatliff.
 **Turbonilla scalpidens*, Watson.
 ,, *hofmani*, Angas.
Cingulina spina, Crosse and Fischer.
 **Pseudorissoina capitivaca*, Hedley and May.
Oscilla tasmanica, Tenison Woods.
 **Septa petulans*, Hedley and May.
 **Cynatium columnarium*, Hedley and May.
 ,, *kampylum*, Watson.
 **Natica elkingtoni*, Hedley and May.
 ,, *subcostata*, Tenison Woods.
 ,, *tasmanica*, Tenison Woods.
 ,, *umbilicata*, Quoy and Gaimard.
Polinices beddomei, Johnston.
 **Amauropsis globulus*, Angas.
Calyptraea pellucida, Reeve.
 ,, *calyptraeformis*, Lamarck.
Trivia australis, Lamarck.
Cypraea angustata, Gmelin.
Cassidea pyrum, Lamarck.
 **Marginella agapeta*, Watson.
 ,, *biplicata*, Tate and May.
 * ,, *columnaria*, Hedley and May.
 ,, *cratericula*, Tate and May.
 * ,, *flindersi*, Pritchard and Gatliff.
 * ,, *laevigata*, Brazier.
 ,, *mayi*, Tate.
 ,, *mustellina*, Angas.
 ,, *ovulum*, Sowerby.
 ,, *simsoni*, Tate and May.
 * ,, *stilla*, Hedley.
 ,, *tridentata*, Tate.
Ancilla marginata, Lamarck.
Terebra bicolor, Angas.
 **Cancellaria pergradata*, Verco.
 ,, *laevigata*, Sowerby.
Mitromorpha alba, Pritchard and Gatliff.
 * ,, *pallidula*, Hedley.

- * *Drillia haswelli*, Hedley.
- * ,, *nenia*, Hedley.
- Daphnella kingensis*, Petterd.
- ,, *minuta*, Tenison Woods.
- * ,, *excavata*, Gatliff.
- Donovania fenestrata*, Tate and May.
- * *Mangelia dyscritos*, Verco.
- ,, *delicatula*, Tenison Woods.
- * ,, *spica*, Hedley.
- ,, *cancellata*, Beddome.
- ,, *granulosissima*, Tenison Woods.
- ,, *modesta*, Angas.
- ,, *desalesi*, Tenison Woods.
- * ,, *hilum*, Hedley.
- Scaphella papillosa*, Swainson.
- ,, *mamilla*, Gray.
- Mitra tasmanica*, Tenison Woods.
- * ,, *vincentiana*, Verco.
- ,, *scalariformis*, Tenison Woods.
- * *Microvoluta purpureostoma*, Hedley and May.
- Euthria tenuicostata*, Tenison Woods.
- Pisania reticulata*, A. Adams.
- Colubraria bednalli*, Brazier.
- * *Arcularia mobilis*, Hedley and May.
- * ,, ,, var. *costata*, Hedley and May
- ,, *jacksonensis*, Quoy and Gaimard.
- * *Pyrene plexa*, Hedley.
- ,, *angasi*, Brazier.
- * *Murex licinus*, Hedley and Petterd.
- ,, *angasi*, Crosse.
- * *Trophon columnarius*, Hedley and May.
- * ,, *molorthus*, Hedley and May.
- ,, *petterdi*, Crosse.
- * ,, *rudolphi*, Brazier.
- * ,, *sarmentosus*, Hedley and May.
- * ,, *simplex*, Hedley.
- * ,, *stimuleus*, Hedley.
- * *Coralliophila lischkeana*, Dunker.
- Cylichna arachis*, Quoy and Gaimard.
- Leucotina micra*, Pritchard and Gatliff.
- * *Philine columnaria*, Hedley and May.
- * *Limacina inflata*, D'Orbigny.
- * *Cavolina trispinosa*, Leseur.
- * ,, *tridentata*, Forskal.
- * *Clio virgula*, Rang.

- * *Clio pyramidata*, Linne.
- * ,, *balantium*, Rang.
- * *Acanthochites crocodilus*, Torr and Ashby.
- * *Lepidopleurus columnarius*, Hedley and May.
- Cadulus spretus*, Tate and May.
- * *Nucula beachportensis*, Verco.
- ,, *micans*, Angas.
- ,, *obliqua*, Lamarck.
- * *Limopsis tenisoni*, var. *penelevis*, Verco.
- Lissarca rubricata*, Tate.
- * ,, *rhomboidalis*, Verco.
- Arca reticulata*, Gmelin.
- * *Glycymeris sordida*, Tate.
- ,, *tenuicostata*, Reeve.
- Philobrya fimbriata*, Tate
- Philippiella crenatulifera*, Tate.
- ,, *rubra*, Hedley.
- Ostrea angasi*, Sowerby.
- Trigonia margaritacea*, Lamarck.
- Chlamys asperrimus*, Lamarck.
- Pecten medius*, Lamarck.
- * *Cyclopecten nepeanensis*, Pritchard and Gatliff.
- * ,, *obliquus*, Hedley.
- * *Lima angulata*, Sowerby.
- ,, *bullata*, Born.
- ,, *lima*, Linne.
- * *Limea murrayi*, Smith.
- Mytilus planulatus*, Lamarck.
- Modiola australis*, Gray.
- Modiolaria barbata*, Reeve.
- Thraciopsis angustata*, Angas.
- Myochama anomioides*, Stutchbury.
- Myodora albida*, Tenison Woods.
- ,, *ovata*, Reeve.
- Cuspidaria tasmanica*, Tenison Woods.
- Cuna atkinsoni*, Tenison Woods.
- * ,, *compressa*, Hedley and May.
- ,, *delta*, Tate and May.
- * ,, *hamata*, Hedley and May.
- Mytilicardia calyculata*, Linne.
- Venericardia amabilis*, Deshayes.
- * ,, *cavatica*, Hedley.
- * ,, *columnaria*, Hedley and May.
- * ,, *dilecta*, Smith.
- ,, *rosulenta*, Tate.

- **Condylocardia porrecta*, Hedley.
 „ *pectinata*, Tate and May.
 **Codakia jacksonensis*, Smith.
 „ *tatei*, Angas.
 **Diplodonta adamsi*, Angas.
 „ *zealandica*, Gray
 **Bornia radiata*, Hedley.
Dosinia caerulea, Reeve.
Chione gallinula, Lamarck.
Tellina decussata, Lamarck.
 **Soletellina hedleyi*, Sowerby.
Saxicava arctica, Linne.
Panopaea australis, Sowerby.
Megasella cumingii, Davidson.
Kraussina atkinsoni, Tenison Woods.
 **Terebratulina radula*, Hedley.
 „ *cancellata*, Koch.
 **Cryptopora brazieri*, Crane.

We have placed the whole of the types of the new species in the Australian Museum collection; they are as follows:—

GIBBULA GALBINA, *sp. nov.*

(Plate xxii., fig. 2).

Shell depressed-turbinate, broadly perforate, translucent, glossy. Colour variable, either uniform buff, uniform white, or brown spirals on a white ground. Whorls four and a half, rounded on the base, subangled at the periphery, flattened above and impressed at the suture. Sculpture: the protoconch smooth, the next whorl with a couple of spiral keels, which by intercalation multiply in number, but decrease in relative importance as the whorls advance, the last whorl carrying close fine spiral threads, of which every fourth or fifth predominates. The radials are confined to faint growth lines. Aperture slightly descending, oblique, angled above, rounded below; outer lip simple; columella expanded, and a little reflected above, a substantial callus unites the lips. Umbilicus deep, narrow, spiral, externally funicular, exempt from the spiral sculpture. Height, 5.5 mm.; maj. diam. 7; min. diam. 6 mm.

Several specimens.

The novelty is nearest to *G. tasmanica*, Petterd, of which it may be regarded as a deep water representative. *G. galbina* is thinner, larger, proportionately lower and broader, and more

widely umbilicate. A single specimen of *G. galbina* was taken by the "Thetis" in 63-75 fathoms off Port Kembla, New South Wales, but was catalogued¹ as *G. tasmanica*, Petterd.

CALLIOSTOMA COLUMNARIUM, *sp. nov.*

(Plate xxii., fig. 3).

Shell rather solid, imperforate, turbinata, angled at the periphery. Colour buff. Whorls five and a half, including a protoconch of a whorl and a half, which is tilted, malleated, and concluded by a small varix. Sculpture: three spiral keels appear on the second whorl; as growth proceeds these increase in number but decrease in strength, till at last behind the aperture they are represented by twenty engraved spiral lines extending from the suture to the centre of the base. These are decussated by faint oblique growth lines. Aperture oblique, rhomboidal, outer lip simple, columella thickened, insertions joined by a thin callus. Height, 7.5; maj. diam., 8; min. diam., 7 mm. A larger broken specimen is 10 mm. in major diameter.

Four imperfect shells were taken. In general appearance this resembles *C. legrandi*, Tenison Woods, but differs by blunter keel and the distant engraved spirals.

CALLIOSTOMA RETIARIUM, *sp. nov.*

(Plate xxii., fig. 1).

Shell small, subperforate, conical, with sharply keeled periphery, overlapping spire whorls and a flat base. Colour and number of whorls uncertain, the latter exceeding six. Sculpture: small spiral threads parted by wider interstices amount to seven on the penultimate, and to twenty on the last whorl, of these a double row compose the peripheral keel. On either side of the keel the interstices are wider than usual. The radials are irregular oblique wave-like folds, twenty-two on the last whorl, which raise beads on the keel rows, and there cease abruptly. On the base incipient radials bead the inner spirals. Aperture oblique, trapezoidal, outer lip simple, sharply angled by the periphery, columella insertion a little reflected over the minute umbilicus. Length, 7; maj. diam., 6; min. diam., 5 mm.

A single worn specimen represents this species, whose sculpture and contour are not approached by any other Australian *Calliostoma*.

¹ Hedley—Austr. Mus. Mem., iv., 1903, p. 334.

BASILISSA NICETERIUM, sp.nov.

(Plate xxii., figs. 4, 5).

Shell imperforate, conical-turbinate, thin, of silken lustre. Colour uniform pale cream. Whorls five and a half, including a small pointed obliquely set protoconch of a whorl and a half. Sculpture: prominent spiral keels, three to the penultimate, ten to the body whorl, successively diminishing from the suture to the base, undercut below the narrow summit, parted by much broader flat interstices. These keels, apparently folds in the shell substance, are microscopically beaded by fine radial striæ, represented in the interstices as hair lines. The protoconch does not share the adult sculpture, but is minutely malleated. Aperture oblique, subcircular, columella glazed, arched, running out to a spur. Outer lip unfinished, the ends of the ribs projecting beyond the interstices like claws. In the throat a furrow corresponds to each external keel. Height, 7; maj. diam, 7; min. diam., 6 mm.

One whole and some fragmentary specimens were taken.

The novelty is by no means a characteristic *Basilissa*, for it is imperforate, its lustre is rather silken than nacreous, if the sutural sinuation exists, it is masked by the sculpture. Yet the aggregate of its characters agree better with *Basilissa* than with another genus. From *Sequenzia*, for instance, which the sculpture immediately suggests, the entire columella excludes it.

LIOTIA PETALIFERA, sp.nov.

(Plate xxii., figs. 6, 7, 8.)

Shell minute subdiscoidal, spire very little elevated, base broadly and deeply umbilicate. Colour white. Whorls four, of which two constitute the protoconch, the last descending, and in slight contact with its predecessor. The protoconch is smooth, helicoid, and sharply defined. Sculpture: last whorl with twenty-four, penultimate with nineteen, elevated curled and forwardly-directed lamellæ, whose broad summits nearly equal their interstices. The lamellæ are smooth and glossy, but the interstices are distantly spirally striated. Aperture complete circular. Height, 0.6; maj. diam, 1.25; min. diam, 0.85 mm.

Several specimens. The species has a general resemblance to *L. capitata*, Hedley, from which the denser varices of *L. petalifera* at once separate it.

RISSOA COLUMNARIA, sp. nov.

(Plate xxii., fig. 9).

A "Rissoa" of the group of *R. bicolor*, Petterd. Small, glossy, subcylindrical, summit blunt. Whorls six, divided by impressed sutures. Colour variable, red, purple, or orange on the apex, fading on the lower whorls; the last usually white, with a pale narrow median yellow band. Sculpture: fine close radial hair lines. Aperture perpendicular, circular, peristome reflected all round. Length, 2.6; breadth, 1.1 mm.

Several specimens. In colour, size, and form this approaches *Rissoa subfusca* var. *micronema*, Suter,² from which it differs by absence of spiral sculpture and more slender shape.

RISSOINA LINTEA, sp. nov.

(Plate xxiii, fig. 11).

Shell elongate, turreted, thin, translucent, glossy. Colour white. Whorls eight and a half, separated by a channelled suture, first two smooth and dome-shaped. Sculpture: numerous close, fine, spiral threads wind over the whole of each whorl. Last whorl ascending at the aperture. Aperture effuse, not provided with a varix, anterior canal well marked, columella arched and broadly reflected on the body whorl. Length, 7; breadth, 2.5 mm.

A few specimens. The lack of radial sculpture at once separates this from other spirally grooved Australian *Rissoina*.

RISSOINA FAUSTA, sp. nov.

(Plate xxii., fig. 10).

Shell smooth, glossy, translucent, elongate, with impressed suture. Colour pale cream, with orange spots disposed in five rows, two of which ascend the spire. Whorls eight. Aperture subtriangular, anterior notch distinct, columella thickened, arched, outer lip slightly reflected, thickened within. Length, 6.5; breadth, 1.5 mm.

Several specimens. This is nearly related to *R. linteata*, but differs in being smaller, coloured and smooth.

² Suter—Proc. Malacol. Soc., iii., 1898, p. 4.

PSEUDORISSOINA CAPITICAVA, *sp. nov.*

(Plate xxiii., figs. 12, 13).

Shell slender, elongate, diaphanous, smooth, constricted at the suture, and thus conveying a nodose expression to the spire. Colour white. Whorls six, exclusive of the protoconch, margined at the suture. The heterostrophæ apex of this genus is more complex than was at first supposed. The early whorls are concealed by the later, and the vertex of the shell is a whorl which rises as an arch and encloses the protoconch in a hood. It may be that the first whorls are not merely wound at right angles to the adult, but are completely reversed by rotation through ninety degrees. Aperture subtriangular, channelled above, effusive below, outer lip thickened, inner lip with a distinct callus deposit. Length, 4.4; breadth, 1.5 mm.

Several specimens. This is closely related to *P. tasmanica*, Tenison Woods, but the novelty is a narrower shell, with an additional and more inflated whorls.

SEPTA PETULANS, *sp. nov.*

(Plate xxiii., fig. 14).

Shell small, conical, produced. Whorls asymmetrically swollen, six remaining on the type. Our material does not present a complete apex. Colour cream, with rusty irregular scattered dashes. Sculpture: seven varices, being at the rate of about one to two-thirds of a whorl, between these slight radial plications raise the larger threads into low tubercles, interstices microscopically transversely striated. The spirals consist of fine revolving threads parted by shallow interstices, sixteen on the penultimate, and about thirty-five on the last whorl. Here and there, especially on the base, the threads tend to be alternately larger and smaller, while a few of the peripheral threads stand out more conspicuously than the rest. Aperture perpendicular, ovate, a conspicuous tubercle in the posterior angle. Anterior portion of the columella crossed by several transverse wrinkles. Outer lip faintly dentate within. Canal short and broad. Length, 3.5; breadth, 1.4 mm.

Several broken shells were dredged, but our figure and description is based on a dead shell gathered by one of us (May) on the beach at Pirate's Bay, near Cape Pillar.

Dr. Dall finds in the radula generic distinction between *Septa* and *Cymatium*. We associate our species with the former from the general resemblance it bears to *S. tritonis*, Linne.

CYMATIUM COLUMNARIUM, *sp. nov.*

(Plate xxiii., fig. 15).

Shell small, thin, elongate, spire rather distorted. Whorls eight, including a smooth, rounded two-whorled protoconch. Colour pale straw. Sculpture: varices eight, sculptured by the spirals, disposed irregularly at intervals of half or two-thirds of a whorl. Longitudinal ribs small, about twenty to a whorl, not reaching the base of the last whorl, narrower than their interstices. Both ribs and interstices crossed by small spiral threads, towards the periphery some threads pack in two prominent bundles, giving the whorl a slightly bicarinate outline; on the final whorl the threads amount to thirty-five. Edge of aperture produced into a thin upstanding rim. On the base of the columella are two elongate tubercles, and distributed within the outer lip are half a dozen others. Canal short. Length, 21; breadth, 8.5 mm.

Several specimens, all dead and mostly broken, were taken off Cape Pillar. The species was previously dredged off the Pilot Station, Derwent River, by one of us (May).

The novelty stands nearest to *C. quoyi*, Reeve, from which it differs by being thinner, more slender, and with weaker sculpture. Three tertiary shells, *T. oligostirus*, *T. gemmulatus*, and *T. sexcostatus*, are described by Prof. R. Tate³ as related to *quoyi*. Dr. Dall is inclined to refer *Triton quoyi* to Conrad's genus *Personella*⁴. Kesteven has suggested that *Nassaria kampyla*, Watson, should also be grouped with *C. quoyi*⁵. Apparently *Peristernia murrayana*, Tate⁶, is related to Watson's species. Dr. J. C. Verco, who kindly compared the species at our request, writes, 2 vi. '08: "*P. murrayana*, Tate, is quite distinct from *N. kampyla*, Watson, in being more solid, and in having three plicate teeth at the end of the columella."

NATICA ELKINGTONI, *sp. nov.*

(Plate xxiii., fig. 18).

Shell small, smooth, rather thin, globose, spire exsert, whorls four. Colour dull white, apex orange, gradually fading away on the succeeding whorls, the last trace being a faint subsutural

³ Tate—Trans. Roy. Soc. S. Austr., x. 1888, pp. 126-7.

⁴ Dall—Smithsonian Miscell. Coll., 47, 1904, p. 130.

⁵ Kesteven—Proc. Linn. Soc. N.S. Wales, xxvii., 1902, p. 473.

⁶ Tate—Trans. Roy. Soc. S. Austr., x. 1888, p. 155; xi. 1889, pl. iv., f. 4.

band on the final whorl. Aperture semilunate. Umbilicus small, half filled by a central spiral callus which expands as a pad on reaching the margin of the aperture. Height, 9; maj. diam., 9; min. diam., 7 mm.

A few specimens. Nearly related to *N. subcostata*, Tenison Woods, but differs by larger size and exsert spire. Named in honour of Dr. J. C. Elkington, our companion on the cruise.

MARGINELLA COLUMNARIA, *sp. nov.*

(Plate xxiii., fig. 19).

Shell rather large, thin, translucent, narrow, subcylindrical, spire slightly elevated. Colour amber. Whorls four. Aperture long, linear, three strong plications on the columella, a thin callus on the inner lip. The outer lip rises above the penultimate whorl from a callus base, which does not quite reach the apex, in a low arch, bends far forward, and then descends vertically. No denticules appear within the lip. Length, 7.5; breadth, 3.5.

Several specimens. The subcylindrical shape of this species readily distinguishes it from co-generic forms, among which *M. caledonica*, Jousseaume, makes the nearest approach.

MICROVOLUTA PURPUREOSTOMA, *sp. nov.*

(Plate xxiii., figs. 20, 21).

Shell small, rather thin, fusiform, blunt at either end. Colour white, within the aperture stained purple. Whorls five. Shell almost smooth; a few faint spiral grooves occur on the base and below the suture. Aperture elliptical, outer lip simple, smooth within. In the conventional attitude two plaits are visible on the columella, but turning the shell to show the deepest interior, a small plait appears above and another below the central couple. Canal short, rounded. Length, 6; breadth, 3 mm. Another specimen, length, 8; breadth, 3.5 mm.

Two specimens. The novelty is distinguished from *M. australis* by lack of colour, feebler plaits, smaller size, and less breadth. Dall has compared *Microvoluta* to *Conomitra*⁷. The characters of the former genus, as now enlarged, seem to us to incline to the Mitridæ rather than to the Volutidæ.

⁷ Dall—Bull. Mus. Comp. Zool., xviii., 1889, p. 163.

ARCULARIA MOBILIS, sp.nov.

(Plate xxiii., fig. 16).

Shell small, rather thin, conical. Whorls well rounded, thus appearing a little contracted at the sutures, in number five and a half, including a smooth two-walled protoconch. Colour dull white, with irregular brown spots, which tend to disposal in spiral bands. Sculpture: the whole shell is neatly engraved with sharp narrow grooves, about ten to the penultimate and eighteen behind the aperture. Wave-like radial ribs, about a dozen to a whorl, are usually more conspicuous above, and become obsolete on the last whorl. Aperture oblique, round, strongly varixed without, crenulated within to correspond with the external sculpture, a slight tubercle posteriorly. Canal short and strongly bent. Length, 7; breadth, 4 mm.

Numerous specimens. We cannot recall any near ally of this very variable shell.

Var. *COSTATA.*

(Plate xxiii., fig. 17).

In this form, which perfectly intergrades with the type, the spiral sculpture is suppressed, and a radial sculpture is assumed of close, strong rounded ribs, about twenty to a whorl, which traverse the whole shell perpendicularly. If the intermediates were unseen, the extreme would be readily granted specific rank.

TROPHON COLUMNARIUS, sp.nov.

(Plate xxiv., fig. 22).

Shell of medium size, elongate, roughened by the profuse decoration. Colour pale yellow, with brown on the apex, a basal and a sutural band. Whorls nine, including a smooth conical protoconch of two and a half whorls. Sculpture: thin projecting varices, nine to a whorl on the larger whorls, ascend obliquely and continuously from whorl to whorl. These varices are scalloped by the passage of the spirals, and develop sharp points on the shoulder; on the base they degenerate to mere scales. The spirals amount to twelve on the body whorl, and to three or four on the upper whorls; they are crowded on the base, but separated on the shoulder by flat interstices of equal or greater breadth. A secondary microscopic sculpture of faint radial threads, and still fainter spiral scratches, appears between the varices. Aper-

ture oval, shielded by the youngest varix; columella excavate. Length 20 mm.; breadth, 8 mm.

Some fragments of this distinct species were also dredged in eighty fathoms twenty-two miles east of Narrabeen, N. S. Wales, by Prof. W. A. Haswell and one of us.

TROPHON MOLORTHUS, *sp. nov.*

(Plate xxiv., fig. 23).

Shell narrowly fusiform. Whorls subgradate, seven, including a smooth pointed two-whorled protoconch. Colour dull white. Sculpture: the radial ribs about twelve to a whorl, are broad and wave-like, divided by interstices of equal breadth, commence at the shoulder, swell at the periphery, and fade away towards the lower suture, or, in the case of the last whorl, the base. The upper whorls are traversed by about eight evenly spaced spiral low cords, separated by flat interstices of equal breadth, which cross ribs and interstices alike. On the last whorl the cords amount to twenty-two. Aperture oval, lip unfinished, canal turned a little to the right. Length, 10·5; breadth, 4·5.

Several specimens. A near ally, a variety of which occurred with it at Cape Pillar, is *T. simplex*, Hedley.⁸ From that *T. molorthus* differs by less rounded and more slowly increasing whorls, shorter canal, and more numerous spirals.

TROPHON SARMENTOSUS, *sp. nov.*

(Plate xxiv., fig. 24).

Shell small, thin, rather glossy, narrowly fusiform, angled at the shoulder. Whorls six, including a smooth, pointed two-whorled protoconch. Colour pearl grey, with ferruginous on base, apex, and sometimes a sub-sutural line. Sculpture: ten low, broad, solid varices, equal in breadth to their flat smooth interstices, continue perpendicularly from whorl to whorl. On the shoulder these develop a pointed tubercle, and on the base are crossed by indistinct spirals. Aperture oval; from the base of the columella projects the inner side of the short rather straight canal. Length, 5; breadth, 2·15 mm.

Several specimens were obtained. *T. petterdi*, Crosse, *T. rudolphi*, Brazier, and the present form a graduated series. The

⁸ Hedley—Austr. Mus. Mem., iv. 1903, p. 380, f. 93.

intermediate form, *Peristernia rudolphi*⁹, Henn and Brazier, which also occurred off Cape Pillar, is distinguished from the novelty by its coarse spirals.

PHILINE COLUMNARIA, *sp. nov.*

(Plate xxiv., figs. 25, 26).

Shell trapezoidal oblong, thin, semitransparent. Colour milk-white. Sculpture: fine close spiral scratches crossed by irregular and inconspicuous growth lines. Aperture below broad, above narrow, the summit arched, projecting beyond the spire, inserted below the top of the last whorl. Edge of outer lip simple. Inner lip defined by a thick layer of callus, at the base of which is a small umbilical groove. Centre of the summit occupied by a shallow pit margined by a groove, but the nucleus is concealed by a layer of callus spreading from the suture. Length, 6.5; breadth, 5 mm.

Several specimens. The novelty is larger than other Australian forms, except *P. angasi*. It is not, however, the young of that species, for it is more trapezoidal, has distinct spiral lines, and an axial hollow above.

LEPIDOPLEURUS COLUMNARIUS, *sp. nov.*

(Plate xxiv., figs. 27, 28).

Valves round backed, greatly arched, lateral areas inclined to the rest of the valve. Posterior valve with full rounded umbo. Girdle with minute, dense, imbricating scales. Colour uniform waxen. Sculpture: minute grains strung in longitudinal radiating rows, parted by deep grooves of equal width. Going forwards from the mucro additional rows are intercalated. The pleural and jugal areas together have about fifty rows. The lateral areas are differentiated by densely packed, less prominent and disarranged grains. Length of single curled and shrivelled specimen about 8 mm.; breadth, 3 mm.

This is the first deep water Chiton to be reported from Australian waters. We have not the advantage of comparison with specimens, but, judging from literature, the novelty has a general resemblance to *L. cancellatus*, Sowerby, and in detail differs by smaller and denser granulations. Compared with *L. inquinatus*,

⁹ Henn and Brazier—Proc. Linn. Soc. N.S. Wales, (2), ix., 1894, p. 166, pl. xiv., f. 1.

Reeve, *L. columnarius* lacks colour, has a more prominent mucro, longer and more arched valves, the granules are sharper and their radial arrangement more distinct.

GLYCYMERIS SORDIDA, Tate.

Pectunculus sordidus, Tate, Trans. Roy. Soc., S. Austr., xiv., 1891, p. 264, pl. xi. f. 8. *Glycymeris sordida*, Verco., *loc. cit.*, xxxi., 1907, p. 227.

This shell appeared plentifully as worn and separate valves. It had not been seen before either in Tasmanian waters or on the Pacific coast. *G. insignis*¹⁰ is probably a synonym.

CUNA COMPRESSA, *sp.nov.*

(Plate xxiv., figs. 29, 30, 31, 32).

Shell rather large for the genus, ovate-truncate, the anterior and dorsal margins forming a right angle, solid, very shallow lunule and escutcheon both narrow and inconspicuous. Colour dull white. Sculpture: irregularly furrowed by growth interruptions, and rayed by about twenty half obliterated riblets, which do not extend over the anterior and posterior extremities. Prodissoconch, a smooth well defined dome, followed by a step. Inner ventral margin denticulated by twenty small tubercles and sockets. Length, 9.2; height, 8.6; depth of single valve, 2 mm.

One of the largest of the genus. Our dredging showed it to be a common shell off Cape Pillar, as Dr. J. C. Verco had previously found it to be in forty fathoms off Beachport, South Australia.

CUNA HAMATA, *sp.nov.*

(Plate xxv., figs. 33, 34, 35, 36).

Shell solid, rather inflated, spiral-ovate, hooked above, lunule faint, escutcheon evanescent. Colour dull white. Sculpture: surface roughened by irregular concentric growth lines, radials wanting. Umbo spirally produced, directed ventrally. Inner ventral margin beset with about thirty small tubercles. Height, 5; length, 4; depth of single valve, 1.5 mm.

At the scene of our investigations this is an abundant species. The "comma" shape distinguishes it readily from the rest of the

¹⁰ Pilsbry—Proc. Acad. Nat. Sci. Philadel., 1906, p. 231

genus. An unnamed shell related to the above, but differing by being half the size, faintly radially ribbed, and not so sharply bent over above, was taken in Half-moon Bay, Stewart Island, New Zealand, by Mr. A. Hamilton.

VENERICARDIA COLUMNARIA, *sp. nov.*

(Plate xxv, figs. 37, 38, 39, 40).

Shell small, trapezoid-oblong, solid, inflated and inequilateral. The anterior side produced, about twice the length of the posterior. Colour uniform pale yellow. Sculpture: twenty-two low radial ribs parted by narrow grooves; anteriorly these are few and broad, posteriorly small and crowded. Irregular growth stages segment the ribs, which are also traversed by a secondary sculpture of fine concentric hair lines. Lunule long and narrow. Inner ventral margin with about eighteen small tubercles. Length, 8; height, 7; depth of single valve, 3 mm.

A few worn and separate valves.

CONDYLOCARDIA PORRECTA, Hedley,

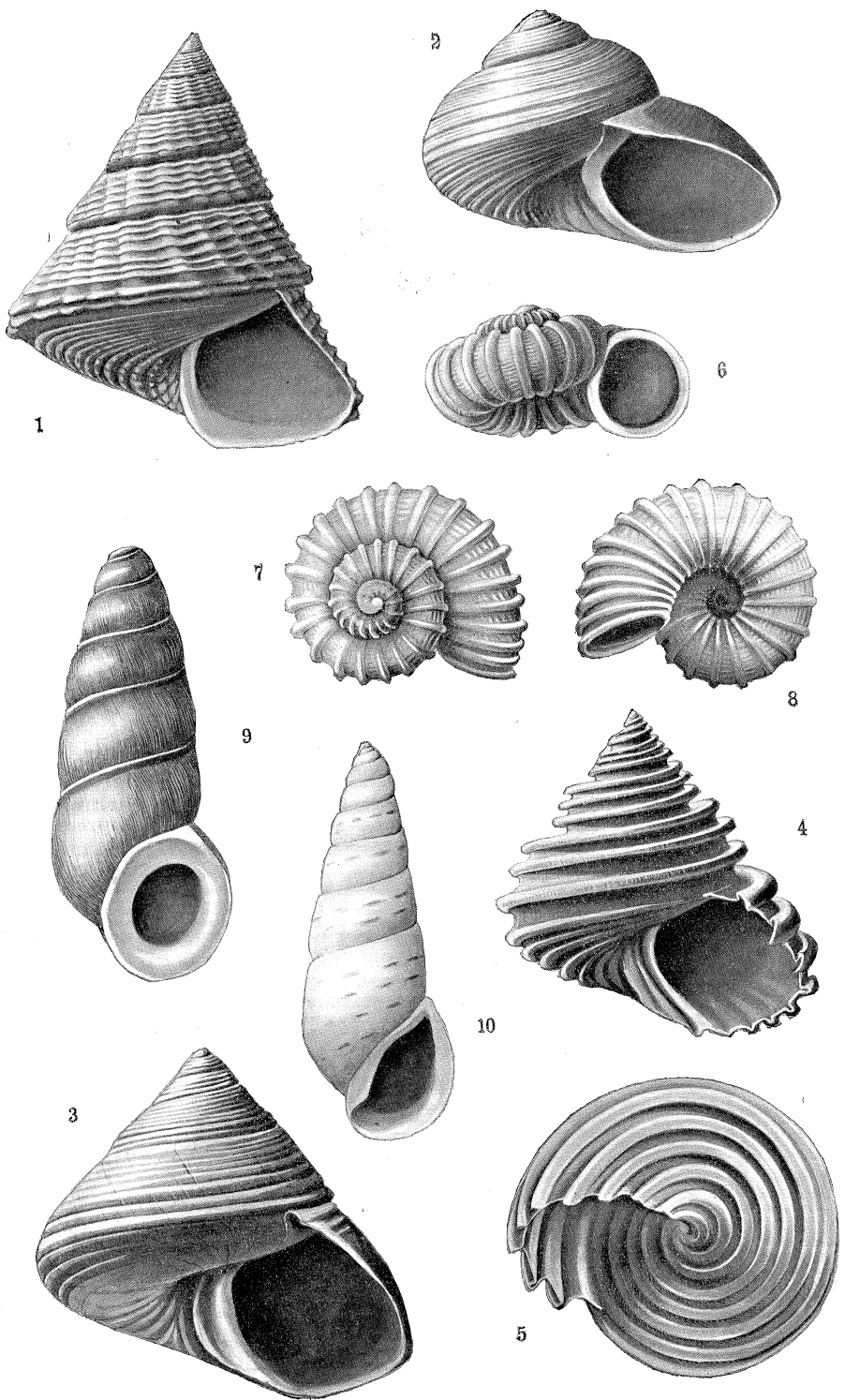
(Plate xxv., figs. 41, 42).

We were surprised to find as a common shell off Cape Pillar this species, described two years ago¹¹, from the Capricorn Islands. And we take the opportunity of substituting an excellent drawing by Miss W. West for the poor figure which accompanied the original description. To facilitate the determination of this difficult group, we also add a figure (Pl. xxv., figs. 43, 44, 45) of the related *C. pectinata*, Tate and May.

¹¹ Hedley—Proc. Linn. Soc. N.S. Wales, xxxi., 1906, p. 475, pl. xxxviii., f. 24.

EXPLANATION OF PLATE XXII.

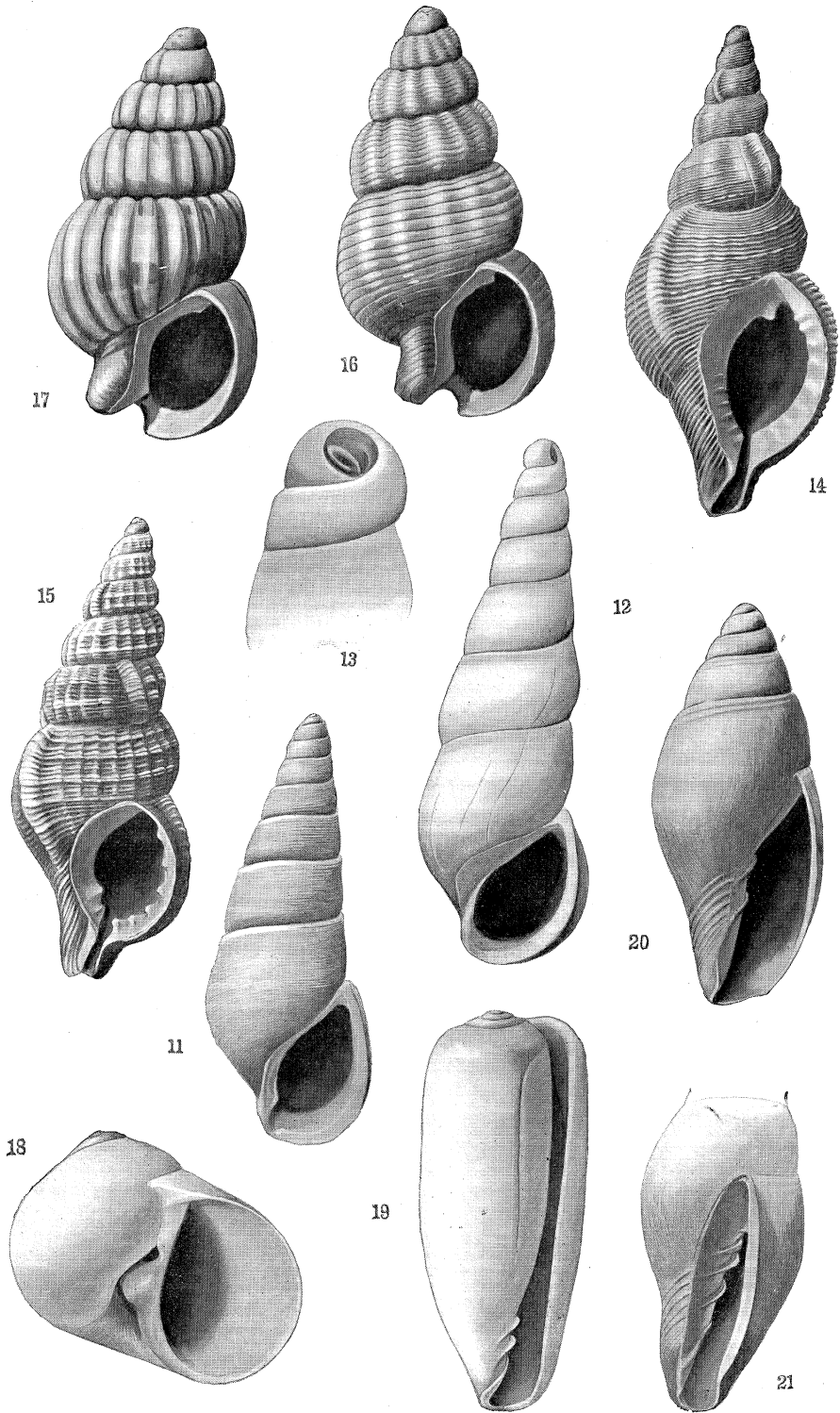
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- Fig. 1. *Calliostoma retiarium*, Hedley and May.
,, 2. *Gibbula galbina* ,, ,,
,, 3. *Calliostoma columnarium* ,, ,,
,, 4-5. *Basilissa niceterium* ,, ,,
,, 6, 7, 8. *Liotia petalifera* ,, ,,
,, 9. *Rissoa columnaria* ,, ,,
,, 10. *Rissoina fausta* ,, ,,



WINIFRED WEST, del.,
Austr. Mus.

EXPLANATION OF PLATE XXIII.

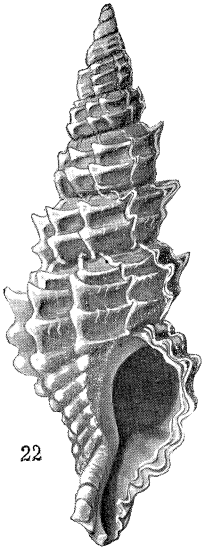
- Fig, 11. *Rissoina linteae*, Hedley and May.
,, 12, 13. *Pseudorissoina capitivava*, Hedley and May.
,, 14. *Septa petulans*, Hedley and May.
,, 15. *Cymatium columnarium*, Hedley and May.
,, 16. *Arcularia mobilis*, Hedley and May.
,, 17. " " var. *costata*, Hedley and May.
,, 18. *Natica elkingtoni*, Hedley and May.
,, 19. *Marginella columnaria*, Hedley and May.
,, 20, 21. *Microvoluta purpureostoma*, Hedley and May.



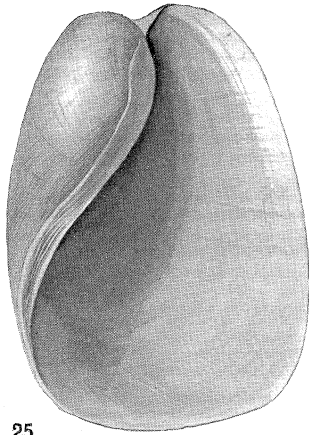
WINIFRED WEST, del.,
Austr. Mus.

EXPLANATION OF PLATE XXIV.

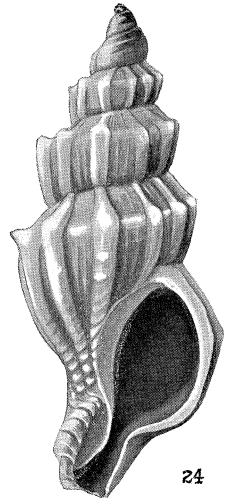
- Fig. 22. *Trophon columnarius*, Hedley and May.
" 23. " *molorthus* " "
" 24. " *sarmentosus* " "
" 25, 26. *Philine columnaria* " "
" 27, 28. *Lepidopleurus columnarius*, Hedley and May.
" 29, 30, 31, 32. *Cuna compressa* " "



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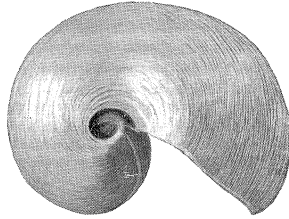
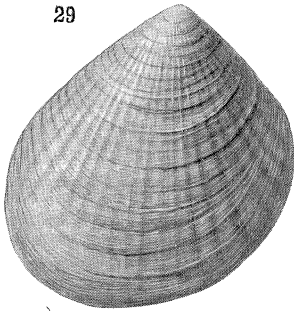


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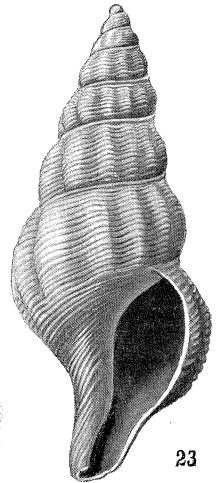


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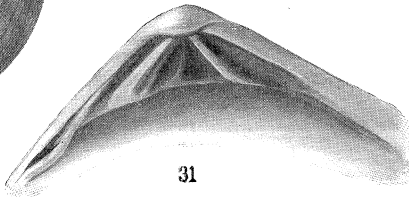
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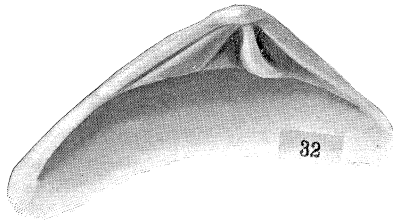


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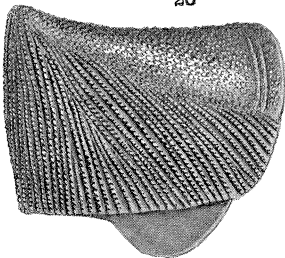
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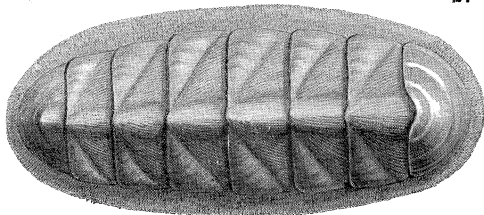


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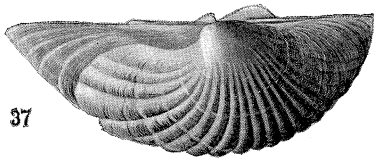


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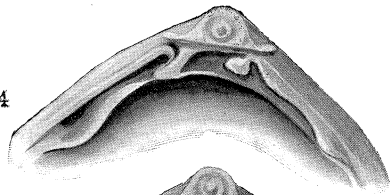


EXPLANATION OF PLATE XXV.

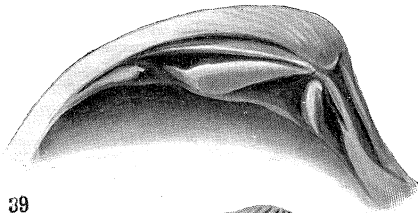
- Figs. 33, 34, 35, 36. *Cuma hamata*, Hedley and May.
,, 37, 38, 39, 40. *Venericardia columnaria*, Hedley and May.
,, 41, 42. *Condylocardia porrecta*, Hedley.
,, 43, 44, 45. ,, *pectinata*, Tate and May.



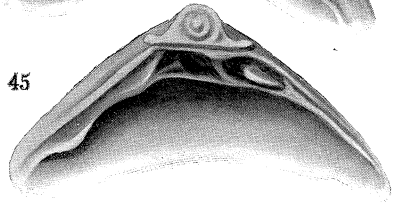
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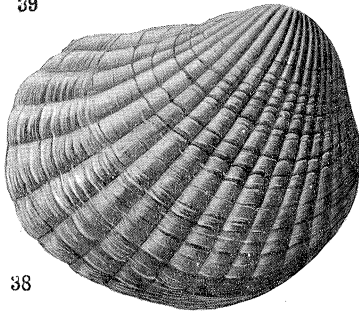
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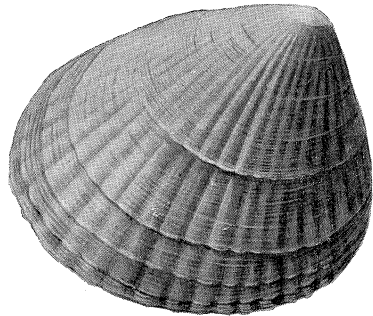
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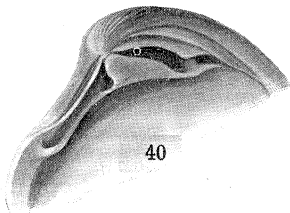
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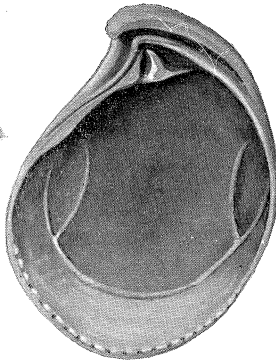
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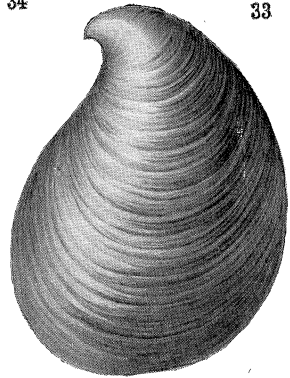
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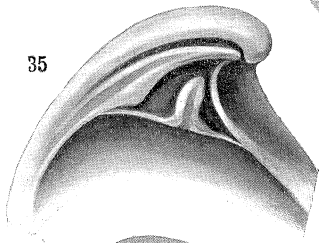
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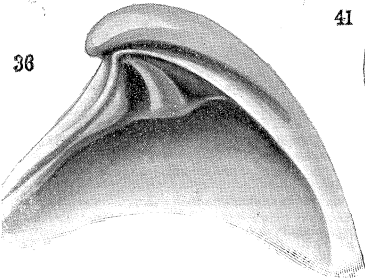
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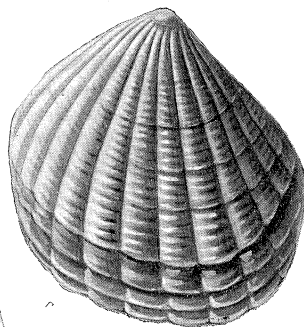


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