

II. Report on the Mollusca obtained by the F.I.S. "Endeavour," chiefly off Cape Wiles, South Australia.

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PART I.

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(Plates XVII.-XX.)

## II.—REPORT ON THE MOLLUSCA.

## PART I.

## I.—INTRODUCTION.

Through the kindness of the Hon. the Minister for Trade and Customs, the writer, in August and September, 1909, enjoyed an opportunity of accompanying the Director of Fisheries on a cruise of the Fishery Investigation Ship, "Endeavour." The voyage extended from Melbourne to the Nuyts Archipelago, South Australia. At every opportunity Mr. Dannevig gave me facilities for using my dredge. By this means a large number of Invertebrates, not procurable by the trawl, were obtained. The largest collection was made on August 28th at a depth of 95-100 fathoms, south of Cape Wiles, South Australia, the precise position being thirty-nine and a half miles S. 43 E. from Liguanea Island, itself about four miles from Cape Wiles. Here three full loads of the bucket dredge were lifted and sieved. The bottom temperature here was not noted, but at 80 fathoms, a short distance away, it was 14°0 Cent. (=57°2 Fahr.), and the surface at midnight was 12°75 Cent. (=52°2 Fahr.). It was in this neighbourhood that in January, 1905, Dr. J. C. Verco, from the s.s. "Lady Diana," made a successful haul thirty-five miles south-west of the Neptune Islands in 104 fathoms, and whence he has recorded so many new species.

Including fragments, illegible or undetermined forms, the Cape Wiles haul contained more than three hundred and fifty species, of which I record two hundred and twenty-six. This agrees with my experience in New South Wales and Tasmania,<sup>1</sup> indicating that the molluscan fauna of a yard or two of the margin of the Australian Continental Shelf consists of from two hundred and fifty to three hundred and fifty species.

This is richer than usual. Based chiefly on American experiences, Dr. W. H. Dall<sup>2</sup> estimates that about four hundred species would constitute an entire fauna of shell-bearing molluscs from an ordinary region between the limits of 40-60 degrees Fahrenheit.

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1 Hedley—*Rec. Austr. Mus.*, vi., 1907, p. 273; *Op. cit.*, vii., 1908, p. 109.

2 Dall & Harris—*Bull. U.S. Geol. Survey*, No. 64, 1892, p. 26.

The species identified from the Cape Wiles station are as follows:—

- Nucula beachportensis*, Verco.  
*Nucula obliqua*, Lamarck.  
*Pronucula decorosa*, Hedley.  
*Leda miliacea*, Hedley.  
*Poroleda ensicula*, Angas.  
*Limopsis erectus*, Hedley & Petterd.  
*Limopsis eucosmos*, Verco.  
*Limopsis tenisoni*, Tenison Woods.  
*Limopsis tenisoni*, var. *penelevis*, Verco.  
*Cyrella concentrica*, Verco.  
*Pleurodon maorianus*, Hedley.  
*Arca pistachia*, Lamarck.  
*Batharca perversidens*, Hedley.  
*Glycymeris pectinoides*, Lamarck.  
*Glycymeris tenuicostatus*, Reeve.  
*Philobrya fimbriata*, Tate.  
*Philobrya pectinata*, Hedley.  
*Trigonia margaritacea*, Lamarck.  
*Chlamys antiaustralis*, Tate.  
*Cyclopecten favus*, Hedley.  
*Lima bassi*, Tenison Woods.  
*Lima bullata*, Born.  
*Limæa austrina*, Tate.  
*Limæa murrayi*, Smith.  
*Limæa parvula*, Verco.  
*Modiola linea*, Hedley.  
*Modiolaria barbata*, Reeve.  
*Arcoperna scapha*, Verco.  
*Pholadomya arenosa*, Hedley.  
*Myodora albida*, Tenison Woods.  
*Verticordia ericia*, Hedley.  
*Verticordia setosa*, Hedley.  
*Ectorisma granulata*, Tate.  
*Cuspidaria alta*, Verco.  
*Crassatellites probleema*, Verco.  
*Crassatellites producta*, Verco.  
*Cuna atkinsoni*, Tenison Woods.  
*Cuna comma*, Verco.  
*Cuna concentrica*, Hedley.  
*Cuna delta*, Tate & May.  
*Cuna hamata*, Hedley & May.  
*Cuna obliquissima*, Tate.  
*Venericardia amabilis*, Deshayes.  
*Venericardia bimaculata*, Deshayes.  
*Venericardia delicata*, Verco.

- Venericardia dilecta*, *Smith*, var. *excelsior*, *Verco*.  
*Venericardia rosulenta*, *Tate*.  
*Mytilicardia calyculata*, *Linne*.  
*Condylocardia compressa*, *Hedley & May*.  
*Cyamiomactra mactroides*, *Tate & May*.  
*Myrtaea bractea*, *Hedley*.  
*Divaricella cuningii*, *Adams & Angas*.  
*Corbis percostata*, *Hedley*.  
*Thyasira flexuosa*, *Montagu*.  
*Turquetia integra*, *Hedley*.  
*Coriarius semiradiatus*, *Tate*.  
*Cardium pulchellum*, *Gray*.  
*Gafrarium angasi*, *Smith*.  
*Chione mesodesma*, *Quoy & Gaimard*.  
*Chione striatissima*, *Sowerby*.  
*Tellina subdiluta*, *Tate*.  
*Soletellina hedleyi*, *Sowerby*.  
*Mactra jacksoniensis*, *Smith*.  
*Saxicava arctica*, *Linne*.  
*Acanthochites crocodilus*, *Torr & Ashby*.  
*Schismope atkinsoni*, *Tenison Woods*.  
*Schismope pulchra*, *Petterd*.  
*Scissurella australis*, *Hedley*.  
*Emarginula superba*, *Hedley & Petterd*.  
*Lucapinella nigrita*, *Sowerby*.  
*Megatebennus concatenatus*, *Crosse & Fischer*.  
*Puncturella fumarium*, *Hedley*.  
*Puncturella demissa*, *Hedley*.  
*Gibbula ocellina*, *Hedley*.  
*Monilea oleacea*, *Hedley & Petterd*.  
*Monilea philippensis*, *Watson*.  
*Calliostoma allporti*, *Tenison Woods*.  
*Calliostoma columnarium*, *Hedley & May*.  
*Calliostoma legrandi*, *Tenison Woods*.  
*Calliostoma meyeri*, *Philippi*.  
*Calliostoma retiarium*, *Hedley & May*.  
*Danilia telebathia*, *Hedley*.  
*Euchelus tasmanicus*, *Tenison Woods*.  
*Leptothyra fugitiva*, *Hedley*.  
*Leptothyra rosea*, *Tenison Woods*.  
*Cirsonella weldii*, *Tenison Woods*.  
*Cyclostrema denselaminatum*, *Verco*.  
*Cyclostrema homalon*, *Verco*.  
*Cyclostrema jaffaensis*, *Verco*.  
*Liotia annulata*, *Tenison Woods*.  
*Liotia denselineata*, *Tate*.  
*Liotia incerta*, *Tenison Woods*.

- Phenacolepas calva, *Verco*.  
 Cocculina tasmanica, *Pilsbry*.  
 Nacella crebristriata, *Verco*.  
 Helcioniscus illabratus, *Verco*.  
 Rissoa hulliana, *Tate*, var. eucraspeda, *Hedley*.  
 Rissoa incompleta, *Hedley*.  
 Rissoa lockyeri, *Hedley*.  
 Rissoa verconiana, *Hedley*.  
 Amphithalamus costatus, *Hedley*.  
 Amphithalamus pyramidatus, *Hedley*.  
 Epigrus ischnus, *Tate*.  
 Rissoina gertrudis, *Tenison Woods*.  
 Rissoina rhyllensis, *Gatliff & Gabriel*.  
 Rissoina tasmanica, *Tenison Woods*.  
 Cithna angulata, *Hedley*.  
 Calyptraea calyptraeformis, *Lamarck*.  
 Capulus devotus, *Hedley*.  
 Mathilda decorata, *Hedley*.  
 Cerithiopsis dannevigii, *Hedley*.  
 Cerithiopsis geniculosus, *Hedley*.  
 Triphora albovittata, *Hedley*.  
 Triphora angasi, *Crosse*.  
 Triphora armillata, *Verco*.  
 Triphora cana, *Verco*.  
 Triphora disjuncta, *Verco*.  
 Triphora epallaxa, *Verco*.  
 Triphora gemmegens, *Verco*.  
 Triphora granifera, *Brazier*.  
 Triphora novapostrema, *Verco*.  
 Triphora pfeifferi, *Crosse*.  
 Triphora regina, *Hedley*.  
 Triphora spica, *Verco*.  
 Triphora tasmanica, *Tenison Woods*.  
 Turritella atkinsoni, *Tenison Woods*, var. medio-  
     angulata, *Verco*.  
 Turritella mediolevis, *Verco*.  
 Turritella quadrata, *Donald*.  
 Turritella smithiana, *Donald*.  
 Vermicularia flava, *Verco*.  
 Vermicularia nodosa, *Hedley*.  
 Ianthina exigua, *Lamarck*.  
 Epitonium acanthopleura, *Verco*.  
 Epitonium valida, *Verco*.  
 Synchrona micra, *Pritchard & Galliff*.  
 Odostomia mayi, *Tate*.

- Cymatium kampylum*, *Watson*.  
*Cymatium olearium*, *Linne*.  
*Natica elkingtoni*, *Hedley & May*.  
*Natica sticta*, *Verco*.  
*Polinices beddomei*, *Johnston*.  
*Eunaticina albosutura*, *Verco*.  
*Ancilla petterdi*, *Tate*.  
*Cancellaria pergradata*, *Verco*.  
*Marginella altilabra*, *May*.  
*Marginella biplicata*, *Tate & May*.  
*Marginella columnaria*, *Hedley & May*.  
*Marginella flindersi*, *Pritchard & Gatliff*.  
*Marginella fulgurata*, *Hedley*.  
*Marginella gabrieli*, *May*.  
*Marginella allporti*, *Tenison Woods*.  
*Marginella indiscreta*, *May*.  
*Marginella lodderæ*, *May*.  
*Marginella microscopica*, *May*.  
*Marginella multiplicata*, *Tate & May*.  
*Marginella ovulum*, *Sowerby*.  
*Marginella stanislaus*, *Tenison Woods*.  
*Marginella stilla*, *Hedley*.  
*Marginella vercoi*, *May*.  
*Conus superstes*, *Hedley*.  
*Daphnella bathentoma*, *Verco*.  
*Daphnella fenestrata*, *Verco*.  
*Daphnella legrandi*, *Beddome*.  
*Daphnella triseriata*, *Verco*.  
*Mangilia gatliffi*, *Verco*.  
*Mangilia hilum*, *Hedley*.  
*Mangilia kingensis*, *Petterd*.  
*Mangilia spica*, *Hedley*.  
*Drillia agrestis*, *Verco*.  
*Drillia denseplicata*, *Dunker*.  
*Drillia dilecta*, *Hedley*.  
*Drillia dulcis*, *Sowerby*.  
*Drillia hectorguia*, *Verco*.  
*Drillia hedleyi*, *Verco*.  
*Drillia jaffaensis*, *Verco*.  
*Drillia lacteola*, *Verco*.  
*Drillia saxea*, *Sowerby*.  
*Drillia tricarinata*, *Tenison Woods*.  
*Drillia trophonoides*, *Verco*.  
*Drillia woodsi*, *Beddome*.  
*Mitromorpha alba*, *Petterd*, var. *axiscalpta*, *Verco*.  
*Mitromorpha axicostata*, *Verco*.

- Mitromorpha pallidula, *Hedley*.  
 Mitromorpha paucilirata, *Verco*.  
 Mitromorpha paula, *Verco*.  
 Mitromorpha solida, *May*.  
 Hemipleurotoma mayi, *Verco*.  
 Mitra retrocurvata, *Verco*.  
 Mitra scalariformis, *Tenison Woods*.  
 Mitra stadialis, *Hedley*.  
 Mitra tasmanica, *Tenison Woods*.  
 Imbricaria porphyria, *Verco*.  
 Pisania schoutanica, *May*.  
 Pyrene atkinsoni, *Tenison Woods*.  
 Pyrene axiaerata, *Verco*.  
 Pyrene beachportensis, *Verco*.  
 Pyrene calva, *Verco*.  
 Pyrene jaffaensis, *Verco*.  
 Trophon plicilaminatus, *Verco*.  
 Trophon recurvatus, *Verco*.  
 Trophon segmentatus, *Verco*.  
 Coralliophila lischkeana, *Dunker*.  
 Typhis bivaricata, *Verco*.  
 Actaeon retusus, *Verco*.  
 Ringicula meridionalis, *Hedley*.  
 Ringicula semisculpta, *Hedley*.  
 Cylichna arachis, *Quoy & Gaimard*.  
 Cylichna atkinsoni, *Tenison Woods*.  
 Philine columnarius, *Hedley & May*.  
 Philine oscitans, *Hedley*.  
 Cavolina inflexa, *Lesueur*.  
 Cavolina trispinosa, *Lesueur*.  
 Cavolina virgula, *Rang*.  
 Limacina bulimoides, *D'Orbigny*.  
 Limacina inflata, *D'Orbigny*.  
 Clio balantium, *Rang*.  
 Clio pyramidata, *Linne*.  
 Dentalium lubricatum, *Sowerby*.  
 Dentalium thetidis, *Hedley*.  
 Terebratulina cavata, *Verco*.  
 Megasella cumingii, *Davidson*.  
 Megasella vercoi, *Blochman*.  
 Campages jaffaensis, *Blochman*.  
 Cryptopora brazieri, *Crane*.  
 Kraussina tasmanica, *Tenison Woods*.

## II.—DESCRIPTIONS OF NEW OR NOTABLE SPECIES.

### A.—PELECYPODA.

#### PLEURODON MAORIANUS, Hedley.

*Pleurodon maorianus*, Hedley, Rec. Austr. Mus., v., 1904, p. 87, fig. 14.

Numerous examples of this occurred off Cape Wiles in 100 fathoms. Some of these were of larger size than those found in New Zealand, being 3 mm. long and 4 mm. high. The species has not been seen previously in Australian waters.

#### CHLAMYS ANTIAUSTRALIS, Tate.

*Pecten antiaustralis*, Tate, Trans. Roy. Soc. S. Austr., viii., 1886, p. 106, pl. ix., f. 7a-7c; xxiii., 1899, p. 269; *id.*, Harris, Brit. Mus. Cat. Tert. Moll. Austr., 1897, p. 315.

Numerous small valves about half an inch in length were dredged in 100 fathoms, forty miles south of Cape Wiles, South Australia. Some are brightly coloured either entire lemon-yellow or irregularly clouded with opaque white and vermilion. Similar specimens were dredged by myself in 100 fathoms off Wollongong, New South Wales. Specimens reaching 100 mm. in diameter were taken plentifully by Mr. W. L. May and myself in 100 fathoms off Cape Pillar, Tasmania. We considered the species,<sup>1</sup> as Prof. R. Tate himself had done on first acquaintance, to be a variety of *C. asperri-mus*, Lamarck. Valid distinctions pointed out by Prof. Tate between the two species are the concentric laminae which lattice the intercostal furrows in the young and the multiplication of the ribs in the old stages of *C. antiaustralis*. Compared with actual fossils, the recent shell is flatter, but its author expressly notes that *C. antiaustralis* "exhibits variations in the degree of convexity." Probably this is the shell identified by Gatliff and Gabriel as the young of *C. radiatus*, Hutton.<sup>2</sup> In their reference, to my opinion of the shell, there is some misunderstanding.

The species has not hitherto been recorded as recent, and this identification adds another survivor from the Tertiary Fauna.

#### VERTICORDIA ERICIA, *sp. nov.*

(Plate xvii., figs. 1, 2, 3.)

Shell small, subcircular, rather solid, apex incurved. Sculpture, about eighteen prominent radiating spiral ribs, which rapidly enlarge with the increase of the shell and pro-

<sup>1</sup> Hedley & May—Rec. Austr. Mus., vii., 1908, p. 113.

<sup>2</sup> Gatliff & Gabriel—Proc. Roy. Soc. Vict., xxiii., 1910, p. 98.



ject at the margin. These are parted by broad and deep interstices, roughened with a grain surface, whereas the summits of the ribs bristle with short, stout, close-set, divaricating, little spikes. Lunule reduced to a narrow crescent under the umbo. Interior nacreous furrowed by the imprint of the external sculpture. In both valves a single conical tooth is set at the margin of the lunule. Length 6·7, height 6, depth of single valve 2·3 mm.

A couple of odd valves occurred in 100 fathoms forty miles south of Cape Wiles, South Australia. Prof. W. A. Haswell and I dredged a fragment in 80 fathoms twenty-two miles east of Narrabeen, New South Wales. The strong ribs and prickly sculpture readily distinguish the species.

VERTICORDIA SETOSA, Hedley.

*Verticordia rhomboidea*, Hedley, Trans. N.Z. Inst., xxxviii., 1905, p. 71, pl. ii., fig. 12, 13, 14; *id.*, Rec. Austr. Mus., vi., 1906, p. 215. [Not *Verticordia rhomboidea*, Tate, Trans. Roy. Soc. S. Austr., ix., 1886 (1887), p. 149, pl. xiv., f. 14.]

*Verticordia setosa*, Hedley, *nom. mut.* Rec. Austr. Mus., vi., 1907, p. 303.

A single valve from 100 fathoms, forty miles south of Cape Wiles, South Australia, represents a species new to the Adelaidean Region. I took the species first in 110 fathoms off Great Barrier Island, New Zealand, and again in 250 and in 800 fathoms off Sydney. In the South Australian example the radial ribs are less prominent than in the New Zealand shells.

VENERICARDIA ROSULENTA, Tate.

(Plate xvii., fig. 4.)

*Cardita rosulenta*, Tate, Trans. Roy. Soc. S. Austr., ix., 1887, p. 69, pl. v., f. 3

The "Endeavour" took *C. rosulenta* off Devonport, Tasmania, and in 40 fathoms north of Cape Borda, South Australia. A giant from the former locality is 45 mm. in length. As the original figure is vague I offer an illustration of a specimen 28 mm. long from St. Vincent's Gulf, for the identification and example of which I am indebted to Dr. J. C. Verco.<sup>1</sup>

The nomenclature of this species is involved in difficulty. After the publication of his name, Prof. Tate observed that Tenison Woods had previously recognised<sup>2</sup> his shell as *C. quoyi*, Deshayes, and he thereupon withdrew his *rosulenta* in

<sup>1</sup> Verco—Trans. Roy. Soc. S. Austr., xxxii., 1908, p. 349.

<sup>2</sup> Tenison Woods—Proc. Roy. Soc. Tasm., 1877, p. 59.

its favour.<sup>1</sup> But Deshayes proposed his name for a New Zealand shell figured and described by Quoy and Gaimard as *Venericardia australis*, Lamarck. Actually, Deshayes indicated for his species Pl. 80, f. 4 of the "Astrolabe" Atlas, but that illustration stands for a *Tridacna*, and the quotation is an evident error for Pl. 70, f. 12-14. The account of Quoy and Gaimard did not profess to introduce a new species but merely to restore the *V. australis* of Lamarck,<sup>2</sup> a small, sub-orbicular, purple, scale-ribbed shell from New Holland, not otherwise figured. The contention of Deshayes was that the Australian shell of Lamarck was wrongly identified with the New Zealand shell of the "Astrolabe" Expedition. Regarding the latter as a new and nameless species, he proposed to call it *Cardita quoyi*.<sup>3</sup> Until the Lamarckian type, now probably in the Geneva Museum, can be re-examined, we cannot judge whether Quoy and Gaimard were right in their identification, and consequently whether Deshayes was, or was not, justified in renaming their shell. But there can be no doubt that Reeve erred in reducing *Venericardia australis* to a synonym of *V. tridentata*, Say.<sup>4</sup>

In any case the verdict does not affect the name before us. Our species is quite different from that figured in the "Astrolabe" Atlas, and to which, if it be maintained, the name of "quoyi" can only apply. Incidentally it may be remarked that this name has never been adopted<sup>5</sup> by the conchologists of New Zealand whom it chiefly concerns.

*V. australis*, Lamarck, is not the only species of the genus that local workers have failed to recognise. *Cardita (Actinobolus) godeffroyi*, Dunker,<sup>6</sup> from Bass Strait, is here unknown. I suggest that it is likely to prove identical with *V. bimaculata*, Deshayes.

After being unseen for nearly forty years, the *Cardita raouli*, Angas,<sup>7</sup> has been rediscovered by Mr. W. L. May<sup>8</sup> in 40 fathoms off Schouten Island, Tasmania. Probably this is what Clessin intends by *Cardita racuti*, Angas (MS.), from New Zealand.<sup>9</sup>

1 Tate—Proc. Linn. Soc. N.S. Wales, xxvi., 1901, p. 434.

2 Lamarck—Anim. Sans Vert., v., 1818, p. 610.

3 Deshayes—Proc. Zool. Soc. 1852 (1854), p. 103.

4 Reeve—Conch. Icon., i., 1843, *Cardita* sp. 22.

5 Suter—Index Faunæ Nov. Zeal., 1904, p. 93.

6 Dunker—Malak. Blatt., xviii., 1871, p. 172; Schmeltz—Cat. Mus. Godeff., v., 1874, p. 173; Clessin—Conch. Cab., Lief. 353, 1887, p. 12, pl. iv., f. 6, 7.

7 Angas—Proc. Zool. Soc., 1872, p. 613, pl. xlii., f. 12.

8 May—Proc. Roy. Soc. Tasm., 1910 (1911), p. 312.

9 Clessin—*Op. cit.*, p. 11, pl. ii., figs. 7, 8.

MYRTÆA BRACTEA, *sp. nov.*  
(Plate xvii., figs. 5, 6, 7, 8.)

Shell rather solid, moderately convex, flatter in the young stages and becoming more inflated when adolescent, squarely oblong, subequilateral. Colour cream. No radial sculpture. Ribs strong, elevata, varying in number and disposition, usually about fifty and set their breadth apart, spaced medially crowded anteriorly and posteriorly. An occasional rib projects at the edge of the lunule and escutcheon, thus forming a dorsal crest of imbricating scales. Umbo small, prominent. Lunule narrow, excavate, chiefly developed in the left valve. Two cardinals in the left valve. Margins of the valve entire. Length 10·5, height 9·5, depth of single valve 2·5 mm.

This species is near *M. brazieri*, Sowerby,<sup>1</sup> but larger, rounder, more inflated and more densely ribbed.

*M. mayi*, Gatliff & Gabriel,<sup>2</sup> is also like it, but *M. bractea* differs by lacking radial sculpture, by being more inflated and closer ribbed.

*Hab.*—Several specimens from 100 fathoms, forty miles south of Cape Wiles, South Australia.

CORBIS PERCOSTATA, *sp. nov.*  
(Plate xvii., figs. 9, 10, 11, 12.)

Shell small, rather solid, inflated inequilateral, anteriorly produced, dorsal margin rather straight, ventral margin rounded. Umbo incurved, bearing a distinct prodissocoach. Sculpture: About thirty-two elevated, strong concentric ribs run from end to end and closely follow one another from the umbo to the ventral margin. From each rib a thin broad flange arching downwards conceals most of the interspace between the ribs. Lunule small, limited by an indistinct groove. Pallial line entire, running from one adductor to the other. Within the ventral margin is set a line of small sockets and tubercles about forty-five in number. Dentition: In the right are two cardinals, the posterior strongest, the anterior half the size of its fellow, compressed and parallel to the hinge plate, anteriorly and posteriorly a slender lateral. In the left, the anterior cardinal of typical *Corbis* is represented by a minute tubercle, posterior cardinal is strong and pointed. Anteriorly a groove receives the right lateral, posteriorly the margin of the valve is produced to act as a lateral. Behind the main cardinals is a slight and elongate chondrophore. Length 4·5, height 3·6, depth of single valve 1·3 mm.

1 Sowerby—Proc. Zool. Soc., 1883, p. 31, pl. vii., f. 2, and Hedley—Mem. Austr. Mus., iv., 1902, p. 319.

2 Gatliff & Gabriel—Proc. Roy. Soc. Vict., xxiv., n.s., 1911, p. 189, pl. xlvii., figs. 8-12.

This species is nearest related to *Chione despecta*, Hedley,<sup>1</sup> from 100 fathoms off Wollongong, New South Wales, than which the novelty is larger, more inequilateral, longer in proportion to height and more closely ribbed. When I described *C. despecta* seven years ago I failed to distinguish the muscle scars. Now I find there is no pallial sinus. But the discrepancy between its hinge and that of typical *Chione* warned me of possible error. Revising the generic position with the aid of the new and related species, I am now constrained to refer both to *Corbis*. Hitherto only a single recent species, a large and handsome shell from the coral reef zone, has been admitted to this genus. The hinge characters do not exactly correspond. These two small species appear to have suffered such atrophy as descent to calm, deep water might be expected to induce in the hinge development of small and thin shells.

*Hab.*—Numerous specimens in 100 fathoms forty miles south of Cape Wiles, South Australia.

CHIONE MESODESMA, Quoy & Gaimard.

*Venus mesodesma*, Quoy & Gaimard, Voy. "Astrolabe," Zool., iii., 1835, p. 532, pl. lxxxiv., f. 17, 18; *id.*, Smith, Rep. Voy. Chall., Zool., xii., 1885, p. 131.

A few specimens in 100 fathoms forty miles south of Cape Wiles. Mr. W. L. May and I took it in abundance in 100 fathoms off Cape Pillar, Tasmania.<sup>2</sup> These specimens were worn, and, without close scrutiny, were passed for *Chione gallinula*, Lamarck. This is the first definite Australian record, though New Holland was assigned to the species in the original description.

B.—GASTEROPODA.

PUNCTURELLA FUMARIUM, *sp. nov.*

(Plate xviii., figs. 13, 14.)

Shell laterally compressed, thin, translucent, erect, the posterior profile usually slightly convex and the anterior slightly concave. Sculpture: Delicate concentric growth lines, small tubercles, conspicuous in profile, are set in radial rows. Summit irregularly notched, subcircular seen from above, cleft with a short, steep posterior limb seen from the side, the spiral apex disappearing from half-grown specimens. Septal plate deeply inserted, nearly perpendicular. Length 2.15, breadth 1.35, height 1.85 mm.

<sup>1</sup> Hedley—Proc. Linn. Soc. N.S. Wales, xxviii., 1904, p. 193, pl. x., f. 35-8.

<sup>2</sup> Hedley & May—Rec. Austr. Mus., vii., 1908, p. 114.

Already from Australia there are recorded *P. hemipsila*, Tate, from the Tasmanian Eocene, and recent *P. corolla*, Verco, from South Australia; *P. demissa*, Hedley, now recorded from South Australia in association with *P. funarium*, and previously from New South Wales, Victoria and New Zealand; *P. galerita*, Hedley, from Queensland; *P. harrissoni*, Beddome, from Tasmania, Victoria and New South Wales, and *P. kesteveni*, Hedley, from New South Wales. The novelty belongs to the section *Fissurisepta* now first represented in Australasia.

*Hab.*—Several specimens from 100 fathoms, forty miles south of Cape Wiles.

MONILEA OLEACEA, Hedley & Petterd.

*Monilea oleacea*, Hedley & Petterd, Rec. Austr. Mus., vi., 1906, p. 215, pl. xxxvii., fig. 1.

Some broken but recognisable specimens of this species were taken in 100 fathoms, forty miles south of Cape Wiles. The type was from 250 fathoms outside Sydney, so the present record extends it to another region. The specific name appeared in the description by a misprint as "*oleata*," but was spelt correctly on the previous page 214 and in the explanation of the plate.

GIBBULA OCELLINA, *sp. nov.*

(Plate xviii., fig. 15.)

Shell small, solid, imperforate, conical, with gradate spire, prominently keeled at the periphery and again at the shoulder. Colour: Below the periphery uniform buff, above it broad, radial stripes of buff pink, alternate with white. Along the periphery are pairs of dashes of madder brown, sometimes these enclose a tinted space and have a background of opaque white, thus assuming an ocellated aspect; apex pink. Whorls five. Sculpture: Base with seven flat evenly-spaced concentric riblets, a strong, revolving cord defines the periphery and ascends the spire. The last and penultimate whorls have four spiral riblets above the periphery, the uppermost stronger and forming the angle of a subsutural shelf. Upper whorls smooth. Aperture round, outer tip simple, dentate by the spirals, columella perpendicular. Length 3, major diam. 3, minor diam. 2.5 mm.

The profile recalls that of *G. coxi*, Angas, but by the sum of its characters this comes nearest to *G. tiberiana*, Crosse. From that the angulation and smaller size distinguish the novelty.

*Hab.*—Several specimens from 100 fathoms, forty miles south of Cape Wiles, South Australia.

DANILIA TELEBATHIA, *sp. nov.*

(Plate xviii., figs. 16, 17.)

Shell ovate, acuminate, imperforate, thin and slightly nacreous. Whorls seven, the first wound horizontally, thus giving the spire a decapitated aspect. Median whorls separated by a channeled suture, flattened on the shoulder and subangled at the periphery, the last slightly descending behind the aperture. Colour: Pale buff with scattered irregular dashes of ochre alternate chocolate dots on the outer lip. Sculpture: The last whorl carries eleven widely-spaced fine spiral cords, the peripheral strongest. Of these six appear on the penultimate and fade gradually away on the upper whorls. Both cords and interspaces are crossed by delicate oblique lamellæ which rise into scales upon the cords. They are crowded on the last whorl, do not cross the suture from whorl to whorl, and become fewer and fainter ascending the spire. The initial whorl is smooth. Aperture very oblique, subcircular. Outer lip effuse, fimbriated by the termination of the spiral sculpture, inner lip projecting over the umbilical region, thence spread from the axis to the right insertion as a solid sheet. Columella spirally ascending within, terminating below in a downwardly directed tubercle, succeeded by a deep notch and an answering ridge. Thence along the edge of the gullet underneath the external varix are about a score of callus rays, alternately long and short, leading to the throat. Behind the aperture, about a millimetre from the free edge, is a sharp, narrow varix rising gradually at the base and ending abruptly at the suture. Length 10, breadth 8 mm.

Judging from literature, our shell is more elevated and finely sculptured than *D. tinei*, Calcara.

This genus has not before been reported from the Southern Hemisphere. As in the Mediterranean and off the Azores, it appears to be confined to deep water.

While on the subject of deep-sea Trochoids, I take this opportunity of pointing out that *Trochus* (*Gibbula*) *glyptus*, Watson,<sup>1</sup> from 410 fathoms off Sydney, should be transferred to *Turricula*.

*Hab.*—Several specimens from 100 fathoms forty miles south of Cape Wiles, South Australia.

LEPTOTHYRA FUGITIVA, *sp. nov.*

(Plate xviii., figs. 18, 19, 20.)

Shell small, solid, depressed-turbinata, narrowly perforate. Colour white. Whorls three and a half, rapidly increasing, last rounded, descending at the aperture. Spire slightly

1 Watson—Chall. Rep., Zool., xv., 1886, p. 75, pl. vi., fig. 6.

gradate. Sculpture: On the base and spire are faint traces of radial sculpture. Along the suture runs a deep groove followed by a corresponding ridge. The remainder of the last whorl is surrounded by a succession of numerous fine spiral threads parted by equal grooves. Aperture subcircular, above with the vestige of a varix, below a fold running from the anterior edge of the mouth to the margin of the umbilicus, edge of lip simple bevelled within, columella excavate. Base rather flat. Umbilicus narrow but deep, a sixth of the shell's diameter. Major diameter 1·85, minor diameter 1·55, height 1·2 mm.

This is smaller, flatter and more finely grooved than other Australian species.

*Hab.*—Numerous specimens were dredged in 100 fathoms forty miles south of Cape Wiles, South Australia.

RISSOA HULLIANA, *Tate*,

VAR. EUCRASPEDA, *var. nov.*

(Plate xviii., fig. 21.)

This deep-sea variety differs from the typical shore form by being pure white, slightly larger and comparatively broader, and by having fewer and more prominent radials. Thus it acquires a lip broader and more scalloped, approaching a varix.

*Hab.*—Several specimens in 100 fathoms forty miles south of Cape Wiles, South Australia.

RISSOA LOCKYERI, *sp. nov.*

(Plate xviii., fig. 22.)

Shell small, rather thin, ovate-conical, imperforate. Colour white. Whorls four, of which the two first are sharply marked off as the protoconch. Sculpture: On the shoulder is a smooth, unbroken slope, succeeded by elevated, widely-spaced spiral keels, of which the last whorl bears eight and the penultimate three. On the earlier whorls are numerous fine spiral striæ. The interstices of the keels are engraved with close radial scratches. Aperture subcircular, lip slightly expanded. Behind the columella is a narrow axial crevice. Length 2, breadth 1·3 mm.

The species is named in honour of Mr. N. Lockyer, Comptroller of Customs, under whose auspices these collections were made. It is related to *R. imbrex*,<sup>1</sup> than which it is smaller, broader in proportion, and possesses more spirals.

*Hab.*—Numerous specimens were taken in 100 fathoms forty miles south of Cape Wiles, South Australia.

1 Hedley—Proc. Linn. Soc. N.S. Wales, xxxiii., 1908, p. 469, pl. x., f. 33.

RISSEO VERCONIANA, *sp. nov.*

(Plate xix., fig. 23.)

Shell small, ovate, thin, translucent. Colour white. Whorls four, rounded and parted by deep sutures. Sculpture: First whorl and a half smooth, next with about twenty-five sharp though delicate radial ribs, these increase till on the last whorl they amount to about forty, below the periphery they fade gradually. Different individuals vary in the development and number of these radials. On the last whorl eight or ten spirals equal in grade to the radials override them, thus enclosing rectangular meshes. On the upper whorls the spirals gradually vanish, so that on the base are spirals alone and on the upper whorls radials alone. A secondary microscopic sculpture of close spiral scratches is most conspicuous in the meshes of the body whorl. Aperture subcircular, angled above. Outer lip fortified by a slight external varix, columella margin expanded and reflected over a small umbilical furrow. Length 2, breadth 1.25 mm.

This species is closely related to *R. filosa*, Hedley and Petterd,<sup>1</sup> from the east coast, but that is larger, has an extra whorl and is more coarsely sculptured. That the difference is not due to growth is shown by the contrast between the upper whorls of the two species. The novelty is dedicated to Dr. J. C. Verco, who has done such admirable work on the Marine Mollusca of South Australia.

*Hab.*—Numerous specimens from 100 fathoms forty miles south of Cape Wiles, South Australia.

AMPHITHALAMUS COSTATUS, *sp. nov.*

(Plate xix., fig. 24.)

Shell small, rather solid, imperforate, narrowly oblong, glossy. Colour uniform ivory white. Whorls five, including a smooth turbinate protoconch of two whorls. Adult whorls wound obliquely, parted by a deeply channeled suture. Sculpture: Broad, flat radial ribs of irregular breadth, crowded on the last half whorl, their ends denticulate the summits of the whorls. So sharp and narrow are the interstices as to resemble cracks. On the last whorl the radials amount to twenty-two. Aperture trumpet-mouthed, oblique, submedian. Length 3, breadth 1.3.

Attempts have been made by Tryon<sup>2</sup> and by Tate<sup>3</sup> to subdivide the *Rissoa* of Australia into groups. These arrangements, though helpful, cannot be regarded as final. If only

1 Hedley & Petterd—Rec. Austr. Mus., vi., 1906, p. 217, pl. xxxvii., f. 2.

2 Tryon—Man. Conch., ix., 1887, pp. 314-69.

3 Tate—Trans. Roy. Soc. S. Austr., xxiii., 1899, pp. 232-7.



as a convenience it would be desirable to break up a genus so unwieldy as *Rissoa* is according to Tryon's presentation. Bearing in mind that the type of *Rissoa*, Freminville, 1814, is *Turbo cimex*, Linn.,<sup>1</sup> it is clear that many of the Australian shells usually so called are not entitled to the name.

In studying the Rissoidæ taken by the "Thetis" Expedition,<sup>2</sup> I noted that, though Watson's subgenus *Scrobs* had been reduced by Tryon to a synonym of the earlier *Amphithalamus*, Carpenter, yet Carpenter's type was rejected by Tryon as insufficiently known. Under these circumstances it seemed unsafe to use *Amphithalamus*.

By the kindness of Mrs. B. Williamson, of Los Angeles, California, I have received a specimen of the type species of the genus *A. inclusus*, Carp., collected by Mr. Henry Hemphill. No illustration of the species seems to have yet appeared, so I figure (Pl. xx., fig. 34) the gift of Mrs. Williamson, which had been identified as *A. inclusus*, Carp.,<sup>3</sup> by Dr. W. H. Dall. On this foundation I can now accept and use Tryon's interpretation of the synonymy. A paper on the West American members of *Amphithalamus*, which Dr. P. Bartsch has published this year, has not yet reached me.

The American shell at once recalls *A. jacksoni*, Brazier, to a less extent *A. petterdi*, Brazier, and *A. scrobiculator*, Watson. Besides these three small species with detached aperture there are others tightly coiled which vary from broad and short to tall and slender. As uncoiling is considered a degenerate feature, the larger, longer, more tightly wound, many whorled, elongate, fusiform shell is probably nearer to the ancestral form of the genus.

*Hab.*—Numerous specimens from 100 fathoms forty miles south of Cape Wiles, South Australia.

It has frequently happened that the Australian species of this group have been described under one name in one serial and figured under another name in another publication. Under these circumstances it seems useful to indicate what species might be referred to *Amphithalamus*. I would suggest the following:—

A. APPROXIMUS, *Petterd*.

*Rissoa approxima*, Petterd, Journ. of Conch., iv., 1884, p. 138; *id.*, Tate and May, Proc. Linn. Soc. N.S. Wales, xxvi., 1901, pl. xxvi., f. 69.

1 Herrmannsen—Ind. Gen. Malacol., ii., 1849, p. 400.

2 Hedley—Mem. Austr. Mus., iv., 1903, p. 353.

3 Carpenter—Ann. Mag. Nat. Hist., xv., 1865, p. 181.

A. BICOLOR, *Petterd.*

*Rissoa bicolor*, Petterd, Journ. of Conch, iv., 1884, p. 137;  
*id.*, Tate and May, Proc. Linn. Soc. N.S. Wales, xxvi.,  
 1901, pl. xxvi., f. 63.

This seems synonymous with *R. annulata*, Hutton (N.Z.  
 Journ. Sci., ii., July, 1884, p. 173; Proc. Malacol. Soc., iii.,  
 1898, p. 3), from New Zealand, over which it has priority.

A. CAPRICORNEUS, *Hedley.*

*A. capricorneus*, Hedley, Proc. Linn. Soc. N.S. Wales,  
 xxxii., 1907, p. 495, pl. xvii., f. 22.

A. COLUMNARIUS, *Hedley & May.*

*Rissoa columnaria*, Hedley and May, Rec. Austr. Mus., vii.,  
 1908, p. 117, pl. xxii., f. 9.

A. COSTATUS, *Hedley*, as above.A. DUBITABILIS, *Tate.*

*Rissoa dubitabilis*, Tate, Trans. Roy. Soc. S. Austr., xxiii.,  
 1899, p. 232; *id.*, Tate and May, Proc. Linn. Soc. N.S.  
 Wales, xxvi., 1901, pl. xxvi., f. 71 [*nom. mut.* for *R.*  
*dubius*, Petterd (not DeFrance), Journ. of Conch., iv.,  
 1884, p. 137].

A. FLAMMEUS, *Frauenfeld.*

*Sabaena flammea*, Frauenfeld, Reise der Novara, Zool., ii.,  
 3, 1867, p. 12, pl. ii., f. 18.

*R. flammia*, Beddome, Proc. Roy. Soc. Tasm., 1882, p. 169.

*R. sophia*, Brazier, Proc. Linn. Soc. N.S. Wales, ix., 1895,  
 p. 697.

*R. beddomei*, Tate, 1899 [*nom. mut.* not *R. flammea*, Pease,  
 Am. Journ. Conch., iii., 1867, p. 297, pl. xxiv., f. 33].

A. FLINDERSII, *Ten. Woods.*

*Rissoina flindersii*, Ten. Woods, Proc. Roy. Soc. Tasm.,  
 1876, p. 154; *id.*, May, Proc. Roy. Soc. Tasm., 1902  
 (1903), p. 111, f. 8.

A. FRAUENFELDI, *Frauenfeld.*

*Rissoa frauenfeldi*, Frauenfeld, Reise der Novara, Zool., ii.,  
 3, 1867, p. 10, pl. ii., f. 13.

A. FRENCHENSIS, *Gatliff & Gabriel.*

*Rissoa frenchensis*, Gatliff and Gabriel, Proc. Roy. Soc.  
 Vict., xxi., 1908, p. 379 [*nom. mut.* for *Rissoa cyclo-*  
*stoma*, Ten. Woods, Proc. Roy. Soc. Tasm., 1877, p. 153;  
*id.*, Tryon, Man. Conch., ix., 1887, p. 344, pl. 71, f. 8.  
 (Not *R. cyclostoma*, Recluz., 1843.)]

A. INCIDATUS, *Frauenfeld*.

*Sabanæa incidata*, Frauenfeld, Reise der Novara, Zool., ii., 3, 1867, p. 12, pl. ii., f. 19.

A. JACKSONI, *Brazier*.

*Rissoa jacksoni*, Brazier, Proc. Linn. Soc. N.S. Wales, ix., 1895, p. 695 [*nom. mut.* for *R. (Scrobs) badia*, Watson, Chall. Rep., Zool., xv., 1886, p. 612, pl. xlvi., f. 3. (Not *R. badia*, Petterd, 1884.)]

A. KERSHAWI, *Ten. Woods*.

*Risoina kershawi*, Ten. Woods, Trans. Roy. Soc. Vict., xiv., 1878, p. 57.

*R. tumida* (Ten. Woods), Tate and May, Proc. Linn. Soc. N.S. Wales, xxvi., 1901, pl. xxvi., f. 67.

A. OLIVACEUS, *Frauenfeld*.

*Alvania olivacea*, Frauenfeld, Reise der Novara, Zool., ii., 3, p. 11, pl. ii., f. 14.

As synonyms of this Brazier (Proc. Linn. Soc. N.S. Wales [2], ix., 1895, p. 696) has reduced *Diala tumida* (Ten. Woods, Proc. Roy. Soc. Tasm., 1875, p. 14) and *Rissoa diemenensis* (Petterd, Journ. of Conch., iv., 1884, p. 138.)

A. PELLUCIDUS, *Tate & May*.

*Rissoa (Nodulus) pellucida*, Tate and May, Trans. Roy. Soc. S. Austr., xxiv., 1900, p. 100; *id.*, Proc. Linn. Soc. N.S. Wales, xxvi., 1901, pl. xxiii., f. 8.

A. PETTERDI, *Brazier*.

*Rissoa petterdi*, Brazier, Proc. Linn. Soc. N.S. Wales, ix., 1895, p. 697; *id.*, Tate and May, Proc. Linn. Soc. N.S. Wales, xxvi., 1901, pl. xxvi., f. 73 [*nom. mut.* for *R. pulchella* (Petterd, Journ. of Conch., iv., 1884, p. 138)].

A. PULVILLUS, *Hedley*.

*Rissoa pulvillus*, Hedley, Proc. Linn. Soc. N.S. Wales, xxx., 1906, p. 526, pl. xxxii., f. 25.

A. PYRAMIDATUS, *Hedley*.

*Scrobs pyramidatus*, Hedley, Mem. Austr. Mus., iv., 1903, p. 354, f. 77.

A. RUBICUNDUS, *Tate & May*.

*Rissoa (Cingula) rubicunda*, Tate and May, Trans. Roy. Soc. S. Austr., xxiv., 1900, p. 100; *id.*, May, Trans. Roy. Soc. Tasm., 1902 (1903), p. 114, f. 13.

A. SALEBROSUS, *Frauenfeld*.

*Alvania salebrosa*, Frauenfeld, Reise der Novara, Zool., ii., 3, 1867, p. 11, pl. ii., f. 15.

A. SCROBICULATOR, *Watson*.

*Rissoa (Scrobs) scrobicator*, Watson, Chall. Rep., Zool., xv., 1886, p. 611, pl. xlvi., f. 4.

A. SUBFUSCUS, *Hutton*.

*Barleeia subfusca*, Hutton, Cat. N.Z. Moll., 1873, p. 28.  
*Rissoa purpurea* (Hutton), Tryon, Man. Conch., ix., 1887, p. 344, pl. lxxi., f. 89.

Recorded as Victorian by Gatliff and Gabriel (Proc. Roy. Soc. Vict., xxiii., 1910, p. 94).

A. TASMANICUS, *Ten. Woods*.

*Eulima tasmanica*, Ten. Woods, Proc. Roy. Soc. Tasm., 1875 (1876), p. 29; *id.*, May, Proc. Roy. Soc. Tasm., 1902 (1903), p. 110, f. 6.

A. WOODSI, *Pritchard & Gatliff*.

*Rissoa woodsi*, Pritchard and Gatliff, Proc. Roy. Soc. Vict., xiv., 1902, p. 104; *id.*, May, Proc. Roy. Soc. Tasm., 1902 (1903), p. 112, f. 9 [*nom. mut.* for *R. cyclostoma* var. *rosea*, Ten. Woods, Proc. Roy. Soc. Tasm., 1877, p. 154].

OXOBA BASSIANA, *sp. nov.*

(Plate xix., fig. 25.)

Shell solid, oblong, subcylindrical, rounded at each extremity. Colour, the upper part of each whorl is dull white, the lower slate-purple, the anterior extremity is again dull white, the dark band on the median third of the last whorl fading away before reaching the aperture, apex brown. Whorls five, rapidly increasing, wound obliquely the last two-thirds of the total length. Sculpture: The earlier whorls are smooth, the later bear fine incised spiral grooves, of which the last has about thirty, the penultimate eighteen, and the antepenultimate twelve. Occasional growth striæ cross the shell obliquely. Aperture pyriform. Columella excavate, outer lip grooved within and bevelled to a sharp edge. Length 4.5, breadth 2 mm.

Compared with *O. glomerosa*, Hedley,<sup>1</sup> from Masthead Island, this is far larger, more solid, comparatively broader and darker in colour. It is probably the species reported by Messrs. Gatliff and Gabriel<sup>2</sup> from Port Albert, Victoria.

*Hab.*—Two specimens from off Devonport, Tasmania (depth unrecorded).

<sup>1</sup> Hedley—Proc. Linn. Soc. N.S. Wales, xxxii., 1907, p. 495, pl. xvii., f. 23.

<sup>2</sup> Gatliff & Gabriel—Proc. Roy. Soc. Vict., xxi., 1908, p. 379.

CAPULUS CALYPTRA, *Martyn*.

*Patella calyptra*, Martyn, Universal Conchologist, 1784, pl. 18.

On previous examination of this South Australian species<sup>1</sup> I pointed out that the *Patella australis*, Lamarck, was really a *Capulus* and had been wrongly transferred to *Hipponyx* by later writers. Placing reliance on Watson's observation that the apices of the two species turned in different directions, I separated *C. australis* from *C. danieli*, Crosse (= *C. calyptra*, Martyn). Further examination indicates that the direction of the apex is not so constant a character. Weight was also attached to the discrepancy of a tropical species occurring as far south as Bass Strait. Since then I have learnt that there is a drift of warm water species from Western Australia round Cape Lewin and across the Bight. By this route it is possible to trace *C. calyptra* back to the tropics.

As *C. danieli*, Prof. R. Tate recorded this from South Australia as a Tertiary fossil.<sup>2</sup>

CERITHIOPSIS DANNEVIGI, *sp. nov.*

(Plate xix., figs. 26, 27.)

Shell small, acicular, translucent. Colour pale buff, the gemmule rows opaque white, apex translucent. Whorls eleven, plus a four or five-whorled protoconch, separated by deep sutures. Sculpture: On the earliest adult whorl are two bead rows, subsequently another row anterior to these develops and becomes fully established about the centre of the shell, on the last whorl a fourth spiral without beads runs along the angle and, as a thread, appears along the suture of the upper whorls. The gemmules amount to about twenty-two on the last whorl, are small and about their breadth apart. Each gemmule of the median row is linked to its neighbour above and below by a perpendicular bar, thus enclosing a deep square pit in the interstice. Whereas the spirals are opaque, the radials are translucent. Protoconch, first whorl smooth, fourth with a median keel, remainder traversed by oblique threads. Base excavate, aperture subquadrate, canal short. Length 5.5, breadth 1 mm.

Named in honour of Mr. H. C. Dannevig, Director of Fisheries, under whose direction these species were obtained.

*Hab.*—Several specimens from 100 fathoms forty miles south of Cape Wiles, South Australia. Also taken previously by Mr. W. L. May and self in 100 fathoms off Cape Pillar, Tasmania.

1 Hedley—Proc. Linn. Soc. N.S. Wales, xxvii., 1903, p. 601.

2 Tate—Trans. Roy. Soc. S. Austr., xvii., 1893, p. 334.

CERITHIOPSIS GENICULOSUS, *sp. nov.*

(Plate xix., figs. 28, 29.)

Shell rather large and solid, regularly tapering, much constricted between the whorls, glossy. Colour uniform snow white. Whorls thirteen, including the protoconch. Sculpture: First two whorls smooth, remainder strongly radiately ribbed. Ribs prominent medially, above diminishing towards the suture, below suddenly cut off at the basal angle, not continuous from whorl to whorl, about fourteen to a whorl. Intercostal spaces terminating squarely below, in the interstices a few faint spiral scratches appear. Base smooth. Aperture pyriform, outer lip simple, canal short and broad. Length 9, breadth 2 mm.

*Hab.*—A few specimens from 100 fathoms forty miles south of Cape Wiles, South Australia.

MATHILDA DECORATA, *Hedley.*

*Mathilda decorata*, Hedley, Mem. Austr. Mus., iv., 1903, p. 352, f. 75.

*Hab.*—A single specimen from 100 fathoms, forty miles south of Cape Wiles, adds this species to the South Australian fauna. It was originally taken by the "Thetis" off Port Kembla, New South Wales.

EULIMA MUNITA, *Hedley.*

*Eulima munita*, Hedley, Mem. Austr. Mus., iv., 1903, p. 358, f. 81.

This species has not hitherto been noted from South Australia. A specimen was found attached to an Echinoderm, *Goniocidaris tubaria*, Lamarck, trawled at some unrecorded position off the South Australian coast.

NATICA ELKINGTONI, *Hedley & May.*

*Natica elkingtoni*, Hedley and May, Rec. Austr. Mus., vii., 1908, p. 119, pl. xxiii., f. 18.

This species was recently discovered off the Tasmanian coast, and is new to South Australia. It appears in the dredging of 100 fathoms forty miles south of Cape Wiles, South Australia.

MARGINELLA FULGURATA, *sp. nov.*

(Plate xix., figs. 30, 31, 32, 33.)

Shell ovate, solid, glossy, with a buried spire. Colour variable; ordinarily on a white ground are drawn narrow, longitudinally directed, orange, zig-zag lines describing about a dozen angles in the shell's length, about ten such to a whorl.

The elbows pointing to the right are filled in with three or four longitudinal strokes. Two spiral bands are indicated by the darkening of one line of markings near the shoulder and of another above the centre. Complete gradations occur between this pattern and one in which the cross strokes and dark spirals are both absent, while broader, fewer, orange lines describe fewer and larger angles. In form the shell passes through a metamorphosis. For about three whorls it is rolled in the same plane, thus exposing above the summits of previous whorls in a flat spire. Passing from a subcylindrical to an ovate shape, the whorl commences to ascend. A callus pad proceeding from the inner lip is piled on the summit. The axis of the shell is marked by a slight depression from beside which the lip springs. A spiral crest, to which the growth striae are brushed backwards, runs from the vertex around the summit.

The columella plaits are variable. Two prominent ones always appear at the anterior extremity, above these and decreasing in size posteriorly there may be from one to seven, the uppermost usually too deep-seated to be visible externally. The inner margin of the lip is finely denticulated for the whole length by about twenty tubercles. In the young stage the throat is grooved to correspond. Length 8.5, breadth 5 mm.

This species ranges west to Cape Lewin and north along the West Australian coast to the tropics. It is well known from the beaches of the latter region. Australian collectors have commonly received it through Tryon and Brazier's identification as *M. sagittata*, Hinds. But that is a native of the tropical West Atlantic,<sup>1</sup> and in colour pattern does not correspond. The record of *M. sagittata*, from Hao in the Paumotu, by Couturier,<sup>2</sup> appears to me to need confirmation.

*M. pulchella*, Kiener, from Norfolk Island,<sup>3</sup> is near this, but is narrower above and appears to have a regular involute growth. In many respects the description of *Marginella liturata*, Menke,<sup>4</sup> agrees, but that unrecognised West Australian shell is excluded by "spira breve conica."

CONUS SUPERSTES, *sp. nov.*

(Plate xx., figs. 35, 36.)

Shell small, solid, regularly conical, angled at the shoulder. Apex mamillate smooth, two whorled, slightly oblique. Sculpture: The whole shell is decorated with flat spiral cords

1 Smith—Journ. Linn. Soc., xx., 1890, p. 489.

2 Couturier—Journ. de Conch., lv., 1907, p. 132.

3 Brazier—Proc. Linn. Soc. N.S. Wales (2), ii., 1888, p. 997.

4 Menke—Moll. Nov. Holl., 1843, p. 28.

defined by narrow, shallow grooves. On the last whorl there are three sulci above and twenty-five below the shoulder, anteriorly these become more crowded and oblique. The whole shell is traversed by delicate growth-striæ. Colour white, in a few examples faint brown dashes appear on the shoulder. Aperture linear. Whorls six, including the protoconch. Length 8.5, breadth 4 mm.

Probably the species attains a larger size, but, as the apex is the chief distinction, larger examples would be recognisable from the present information. Apparently its nearest relation is *C. convexus*, Harris,<sup>1</sup> from the Victorian Eocene, of which I have not seen specimens. Compared with *C. anemone*, Lamarek, the apex of *C. superstes* is more mamillate, and the spiral grooves are stronger; the shoulder of the spire whorls are not tuberculate in *superstes*, as they are in *anemone*.

*Hab.*—Several specimens, mostly young, from 100 fathoms forty miles south of Cape Wiles, South Australia.

MITRA STADIALIS, *sp. nov.*

(Plate xx., fig. 37.)

Shell small, thin, fusiform. Colour white, opaque and glossy above the horizon of the lip insertion, below that level dull and subtranslucent, a spiral pair of orange threads run along the centre of each whorl. Whorls seven, of which two form a small and glossy protoconch. Sculpture: Low, rounded radial ribs, about eighteen to a whorl, their breadth apart, traverse the upper whorls and cease at the subtranslucent zone. On the upper part of the whorl are a few lightly engraved spirals, the most conspicuous following the pair of colour lines. Six slight and crowded spirals run along the tip of the snout. Aperture narrow, canal short, bent, outer lip lirate within, inner lip a thin callus. Plaits four, deep-seated, upper nearly horizontal, lower oblique. Length 8.5, breadth 3 mm.

This species is allied to *M. tasmanica*, Ten. Woods, but is narrower, with slighter sculpture.

*Hab.*—Several specimens from 100 fathoms forty miles south of Cape Wiles, South Australia.

RINGICULA MERIDIONALIS, *sp. nov.*

(Plate xx., fig. 38.)

Shell ovate, thin, glossy, the more solid parts opaque white, the less solid translucent pearl grey. Whorls five. Sculpture: The whole shell is girt with flat-topped spiral ribs parted

<sup>1</sup> Harris—Brit. Mus. Cat. Tert. Moll. Austr., i., 1897, p. 31, pl. ii., f. 5.



by sharp but shallow spiral grooves, these are evenly distributed, they amount to sixteen on the last whorl and to six on the penultimate and antepenultimate in the example drawn. In other instances the ribbing is closer. Aperture: The outer lip is thickened to form a slight external varix but is not dentate within. Columella with two strong plications, above which a callus thick-spread on the body whorl projects a broad, blunt tubercle into the aperture. Length 2.5, breadth 1.65 mm.

*R. australis*, Hinds, also from South Australia, is larger but proportionately narrower. *R. delecta*, Murdoch and Suter, from New Zealand, is larger, proportionately broader and more densely striated.

*Hab.*—Numerous specimens were dredged in 100 fathoms forty miles south of Cape Wiles.

#### RINGICULA SEMISCUPTA, *sp. nov.*

(Plate xx., figs. 39, 40.)

Shell rather large and thin for the genus, ovate-globose, glossy, subtranslucent. Whorls rounded, five, including a tilted subimmersed apex. Suture impressed, bordered by an opaque line. Sculpture: Everywhere are fine microscopic growth lines, and on the shoulder a few microscopic revolving scratches, on the base half a dozen widely-spaced spiral grooves. Outer lip thickened in a low varix, not dentate, sinuate posteriorly, insertion rising a little above the line of the suture. Inner lip spread on the body whorl in a thick callus, but without any tubercle. Columella with two prominent, deeply-entering folds, the anterior larger and projecting beyond the canal. Length 5, breadth 3.5 mm.

Judging from literature, it is related to *R. nitida*, Verrill, from which the spiral sculpture would distinguish it.

*Hab.*—A few specimens from 100 fathoms forty miles south of Cape Wiles, South Australia. I have also taken it in 80 fathoms off Narrabeen, New South Wales, and in 300 fathoms off Sydney.

### C.—SCAPHOPODA.

#### DENTALIUM THETIDIS, *Hedley.*

*Dentalium thetidis*, Hedley, Mem. Austr. Mus., iv., 1903, p. 327, f. 61.

This species is new to the province, not having yet been recorded beyond the original habitat of New South Wales. A few specimens occurred in 100 fathoms forty miles south of Cape Wiles, South Australia. Whereas the type has but

seven ribs, these have mostly eight, but sometimes nine or even ten. The intercostal threads are less distinct in the western examples.

#### D.—BRACHIOPODA.

CAMPAGES JAFFAENSIS, *Blochmann*.

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

*Magasella jaffaensis*, Blochmann, Trans. Roy. Soc. S. Austr., xxxiv., 1910, p. 92, pl. xxvii., f. 6-9.

In describing this species, Professor Blochmann seems to have used imperfect material, at any rate, his figure displays the brachial apparatus in a broken state. It is therefore here refigured.

The original definition of *Magasella*<sup>1</sup> runs:—"Shell with the reflected portions of the apophyses united, forming a loop." In the Australian shell the union of the apophyses is carried to a much greater extent. They join in a hood or funnel rather than a loop. The ascending and descending limbs also coalesce in a fold which forms a double wall to the funnel. Further, the mesial septum does not project beyond the fold and is insignificant compared to the development attained in typical *Magasella*.

These characters seem as substantial as those by which *Magasella* is differentiated from other groups, and I have therefore already employed them to found a genus *Campages*.<sup>2</sup> *C. jaffaensis* is quite distinct from the type species *C. furcifera*, which attains a larger size and has the corners of the mouth turned down. From P. Eichler's illustrations<sup>3</sup> it would appear that *Magellania joubini*, Blochmann, should also be referred to *Campages*.

In describing *Cistella australis*, Blochmann<sup>4</sup> appears to have overlooked Dall's correction<sup>5</sup> of that generic name. *Cistella*, Gray, 1853, was preoccupied by *Cistella*, Gistel, 1848; in substitution, Dr. Dall has proposed "*Argyrotheca*."

*Hab.*—The "Endeavour" trawled *C. jaffaensis* in 40 fathoms north of Cape Borda, South Australia. I have taken it in 250 fathoms outside Sydney, in 80 fathoms outside Narrabeen, and, in conjunction with Mr. W. L. May, in 100 fathoms off Cape Pillar, Tasmania.

1 Dall—Am. Journ. Couch., vi., 1871, p. 134.

2 Hedley—Rec. Austr. Mus., vi., 1905, p. 43, f. 5, 6.

3 Eichler—Deutsch. Sud-Pol. Exped., xii., Zool., iv., 1911, p. 388, pl. xliv., f. 23, 24.

4 Blochmann—Trans. Roy. Soc. S. Austr., xxxiv., 1910, p. 93, pl. xxvii., f. 10, 12.

5 Dall—Nautilus, xiv., Aug. 1900, p. 44.