

# MOLLUSCA COLLECTED BY m.v. "CHALLENGE" OFF THE EAST COAST OF AUSTRALIA

By T. A. GARRARD.\*

## SUMMARY.

A systematic list of the mollusca obtained during the prawn surveys carried out off the east coast of Australia by m.v. "Challenge" on behalf of the Commonwealth Fisheries Office is given; sixteen new species are described, and three new generic names are introduced.

## INTRODUCTION.

A survey of the eastern coast of Australia covering most of the continental shelf and also parts of the continental slope down to 170 fathoms, was carried out by m.v. "Challenge" in a search for new prawning grounds from July to December 1957, February to August 1958, February to August 1959, and November 1959 to May 1960, under the auspices of the Commonwealth Fisheries Office, Canberra.

The area covered extended from Bass Strait to Cairns in Queensland, and unfortunately it is understood that no new prawning grounds of any consequence were discovered. However the quantity of marine life brought up by the nets was considerable, and it is a matter for great regret that two or three scientific workers were not on board throughout the surveys for the purpose of general collecting.

Unfortunately the author had no knowledge of the undertaking until the third survey was well under way, and therefore the bulk of the material obtained came from the area covered between Newcastle and Port Kembla, when the vessel berthed on several occasions in Port Jackson. Very little co-operation was obtained in securing material, and despite promises the fourth survey yielded only a handful of shells. However Dr. Racek of the Department of Zoology, Sydney University, spent a short period on board and managed to obtain some useful specimens, and some others have been obtained through the agency of Mr. D. Gates, all of which have been shared between the Australian Museum, Sydney, and the National Museum of Victoria, Melbourne. It was considered that the

\*3 The Circle, Dundas, N.S.W.

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Fig. 3: *Floraconus wallangra* Garrard. Holotype. Aust. Mus. C. 63323. Mag. X1.

Figs. 4a, 4b: *Mamiconus minnamurra* Garrard. Holotype. Aust. Mus. C. 63350 (a), and paratype (b). Mag. X1.

Fig. 5: *Colubraria fantomei* Garrard. Holotype. Aust. Mus. C. 63346. Mag. X2/3.

Fig. 6: *Colubraria myuna* Garrard. Holotype. Aust. Mus. C. 63347. Mag. X1.

Fig. 7: *Turris binda* Garrard. Holotype. Aust. Mus. C. 63351. Mag. X2/3.

Fig. 8: *Turriculac murrewolga* Garrard. Holotype. Aust. Mus. C. 63352. Mag. X1.

Figs. 9a, 9b: *Pulchraniscia delecta* Garrard. Holotype. Aust. Mus. C. 63343. Mag. X1.

Fig. 10: *Thracidentula perulae* Garrard. Holotype. Aust. Mus. C. 63340. Mag. X1.

Figs. 11a, 11b: *Russetia dilaniatus* Garrard. Holotype. Aust. Mus. C. 63345. Mag. X1.

quantity secured warranted the compilation of a systematic list in order to give a better idea of the distribution of some of the species found and add further data regarding some of them, whilst the discovery of no less than sixteen new species has given considerable added value to this record. All localities mentioned are indicated in the map on page 37.

The systematic arrangement here followed is largely that used in the "Reference List of the Marine Mollusca of New South Wales" by Tom Iredale and Donald F. McMichael, at present in press, and to a manuscript copy of which the present author had access, and thanks are extended to them for their invaluable assistance in searching records and checking of references.

#### SYSTEMATIC LIST OF SPECIMENS

##### CLASS PELECYPODA (LAMELLIBRANCHIA)

##### SUBCLASS PRIONODESMACEA

##### FAMILY NUCULIDAE

*ENNUCULA* Iredale 1931, Rec. Aust. Mus. 18, p. 202, type species by original designation *obliqua* Lamarck.

*obliqua* Lamarck 1819, Hist. Anim. s. Vert., 6 (1), p. 59.

One live specimen in 65 fathoms east of Broken Bay.

##### FAMILY LIMOPSIDAE

*VERSIPELLA* Iredale 1931, Rec. Aust. Mus., 18, p. 203, type species by original designation *soboles* Iredale.

*soboles* Iredale 1931, Rec. Aust. Mus., 18, p. 203.

Two single valves in 90-100 fathoms east of Tuggerah; one live specimen off Broken Bay; ten live specimens east of Botany Bay in 60 fathoms; three live specimens in 45-75 fathoms east of Port Kembla.

*SENECTIDENS* Iredale 1931, Rec. Aust. Mus., 18, p. 204, type species by original designation *dannevigi* Iredale.

*dannevigi* Iredale 1931, Rec. Aust. Mus., 18, p. 204.

Ten live specimens in 160 fathoms east of Newcastle; eight live specimens in 75 fathoms east of Broken Bay; five live specimens in 60 fathoms east of Stanwell Park.

##### FAMILY ARCIDAE

*DESTACAR* Iredale 1936, Rec. Aust. Mus., 19, pp. 268, 334, type species by original designation *metella* Hedley.

*metella* Hedley 1917, Proc. Linn. Soc., N.S.W., 41, p. 681, pl. 51, figs. 36, 37.

One live specimen off Broken Bay; a quantity of live specimens in 45 fathoms east of Botany Bay.

##### FAMILY GLYCYMERIDAE

*VELETUCETA* Iredale 1931, Rec. Aust. Mus., 18, p. 203, type species by original designation *flammea* Reeve.

*thackwayi* Iredale 1931, Rec. Aust. Mus., 18, p. 203.

One live specimen in 50 fathoms east of Botany Bay.

#### FAMILY TRIGONIIDAE

*NEOTRIGONIA* Cossman 1912, Ann. Paleont., 7, p. 81, type species by monotypy *margaritacea* Lamarck.

*lamarckii* Gray 1838, Ann. Nat. Hist., (1), p. 482.

Two live specimens in 45 fathoms east of Broken Bay; one live specimen in 37-40 fathoms east of Barrenjoey Light; two single valves in 50 fathoms east of Botany Bay.

*gemma* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 193, pl. 33, figs. 1, 2, Pl. 35, f. 1.

Nine single valves in 45 fathoms east of Broken Bay.

#### FAMILY PECTINIDAE

*MESOPEPLUM* Iredale 1929, Rec. Aust. Mus., 17, p. 162, type species by original designation *caroli* Iredale.

*caroli* Iredale 1929, Rec. Aust. Mus., 17, p. 162, pl. 38, f. 7-9.

A number of live specimens taken in depths from 25 to 60 fathoms from Newcastle Bight to Bass Strait.

*MIMACHLAMYS* Iredale 1929, Rec. Aust. Mus., 17, p. 162, type species by original designation *asperrima* Lamarck.

*asperrima* Lamarck 1819, Hist. Anim. s. Vert., 6 (1), p. 174.

One live specimen in 30 fathoms east of Twofold Bay.

*NOTOVOLA* Finlay 1926, Trans. New Zeal. Inst., 57, p. 451, type species by monotypy *novaezealandiae* Reeve.

*fumata* Reeve 1852, Conch. Icon., 8, pl. 9, f. 32.

Fairly plentiful in all depths up to 100 fathoms, and on all parts of the coast from Port Stephens southward to Bass Strait.

#### FAMILY AMUSIIDAE

*AMUSIUM* Röding 1798, Mus. Bolten, pt. 2, p. 165, type species by tautonymy *pleuronectes* Linne.

*ballotti* Bernardi 1861, J. de Conch., 9, p. 46, pl. 1, f. 1.

One live specimen in 27-35 fathoms east of Broken Bay; considerably darker red in colour than specimens commonly found in southern Queensland.

#### FAMILY DIMYIDAE

*DIMYARINA* Iredale 1936, Rec. Aust. Mus., 19, p. 269, type species by original designation *corrugata* Hedley.

*corrugata* Hedley 1902, Mem. Aust., Mus., 4, p. 308, f. 52.

Found alive in fair numbers in 40-50 fathoms east of Botany Bay.

#### FAMILY OSTREIDAE

*OSTREA* Linne 1758, Syst. Nat. ed. 10, p. 696, type species by subsequent designation (Gray 1847, Proc. Zool. Soc. Lond. 1847, p. 201) *edulis* Linne.

? *nomades* Iredale 1939, Great Barrier Reef Exp., p. 395, pl. 7, f. 1, 1a, 1b.

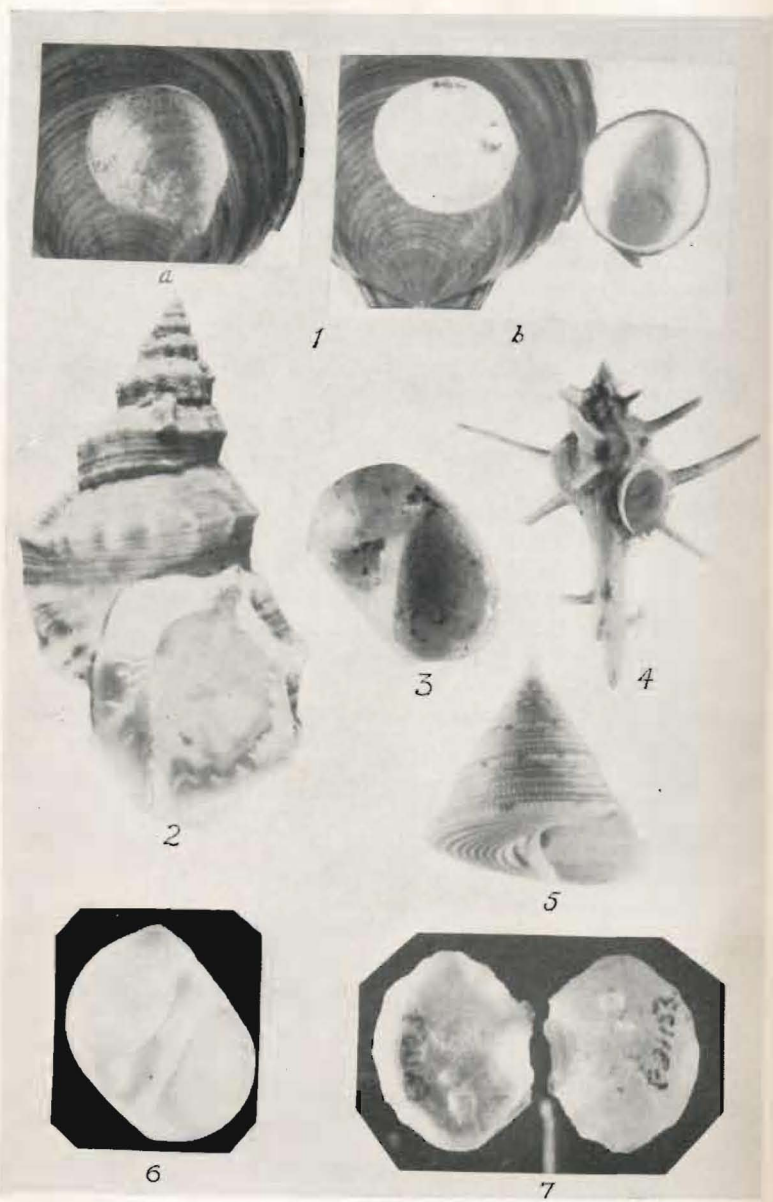


PLATE 2.

Fig. 1a, 1b: *Cavulus sycophanta* Garrard. Holotype, Aust. Mus. C. 63342. Mag. X $\frac{1}{2}$ .

Fig. 2: *Bursa latitudo* Garrard. Holotype, Nat. Mus. Vic. F. 21111. Mag. X $\frac{2}{3}$ .

(Pl. 2, fig. 7.)

A small specimen from deep water N.N.E. of Cape Byron, 24 mm. long, 21 mm. from umbo to farthest point of ventral margin, 5 mm. in section, is more than usually light and frail for this species, but owing to the inherent risk in naming a new species of such variable shells as the genus *Ostrea*, the specimen obtained is catalogued herein until further material can be obtained. It varies in many ways from *nomades* Iredale, notably by total absence of any greenish colouring or green muscle scar, presence of fine reddish lines on the fairly flat upper valve, and considerably lighter construction generally. This appears to be the "small white oyster" to which Iredale refers in the two final paragraphs of his description of *nomades*, but the illustration shown at Pl. 7, f. 1a, is a typical *nomades* and not this flatter and frailer form.

*Description:* Shell small, adherent, frail, translucent, inequilateral; upper valve slightly convex with crenulated margins, lower valve flat with vertically raised ventral margin; sculpture consists only of irregular concentric growth striae; hinge line long and narrow; muscle scar very small; colouration off-white with extremely fine broken irregular lines of reddish orange radiating from umbo to ventral margin on upper valve only.

Specimen described is in possession of the National Museum of Victoria, Melbourne, where it is registered No. F. 21153.

#### FAMILY MYTILIDAE

*MODIOLUS* Lamarck 1799, Mem. Soc. Nat. Hist. Paris, p. 87, type species by monotypy *modiolus* Linne.

*peronianus* Laseron 1956, Aust. Zool., 12, p. 269, f. 22-24.

One live specimen east of Bermagui.

#### SUBCLASS ANOMALODESMACEA

#### FAMILY THRACIIDAE

#### *THRACIDENTULA* gen. nov.

This new genus is created for a shell having, apart from the main characteristics of the family, an internal calcified ligament or lithodesma.

Generic description is: Shell oblong, equilateral, ventricose, gaping posteriorly; anterior dorsal margin concave, posterior dorsal margin convex, tapering more anteriorly than posteriorly; right valve slightly overlapping left at posterior dorsal margin; whole shell covered with small elevated granules arranged radially; valves joined internally by a calcified ligament or lithodesma.

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#### PLATE 2—Continued.

Fig. 3: *Propesinum umbilicatum minusculum* Iredale. Aust. Mus. C. 63354. Mag. X2.

Fig. 4: *Poirieria kurranulla* Garrard. Holotype. Nat. Mus. Vic. F. 21118. Mag. X1.

Fig. 5: *Astele bularra* Garrard. Holotype. Aust. Mus. C. 63341. Mag. X1.

Fig. 6: *Polinices putealis* Garrard. Holotype. Aust. Mus. C. 63344. Mag. X1.

Fig. 7: *Ostrea* ? *nomades* Iredale. Nat. Mus. Vic. F. 21153. Mag. X1.

*Thracidentula perulae* sp. nov.

(Pl. 1, fig. 10.)

*Description:* Shell oblong, equilateral, inequivalve, thin, semi-transparent, posterior side truncated and widely gaping, anterior side rounded, a slight furrow runs obliquely from umbo to posterior ventral margin on both valves; lunule long and narrow; resilifer long and widening towards posterior end, attached for full length; interior connecting lithodesma shaped like an arrow head when viewed from above, in situ pointing to anterior end.

Sculpture consists of wavy radiating irregularly spaced lines of fine granules, covered by a fine pale salmon-pink periostracum. Colour of shell off-white, lunule bright salmon-pink; interior of shell nacreous and off-white; pallial sinus wide and shallow.

*Dimensions:* Holotype, length 36 mm., height 26 mm., section of conjoined valves 15 mm.

*Type Locality:* In 45 fathoms east of Broken Bay, N.S.W.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63340, with one paratype; one paratype in author's collection, with another from 50 fathoms east of Newcastle, and a further paratype from type locality presented to National Museum of Victoria, Melbourne.

FAMILY POROMYIDAE

*ECTORISMA* Tate 1892, Trans. Roy. Soc. South Aust., 15, p. 127, type species by original designation *granulata* Tate.

*granulata* Tate 1892, Trans. Roy. Soc. South Aust., 15, p. 127, pl. 1, figs. 3, 3a.

One live specimen in 100 fathoms east of Stanwell Park.

FAMILY CUSPIDARIIDAE

*CUSPIDARIA* Nardo 1840, Revue Zool. Soc. Cuv. 1840, p. 30, type species by original designation *cuspidata* Olivi.

*latesulcata* Tenison-Woods 1878, Proc. Linn. Soc. N.S.W., 2, p. 123.

One live specimen off Cape Moreton; three live specimens in 45 fathoms east of Broken Bay; one live specimen in 37-40 fathoms east of Barrenjoey Light; two single valves in 45 fathoms east of Botany Bay.

*exarata* Verco 1908, Trans. Roy. Soc. South Aust., 32, p. 199, pl. 12, figs. 6, 7.

One dead specimen in 142 fathoms east of Tuggerah Lakes; one dead specimen in 45 fathoms off Broken Bay; five live specimens in 70 fathoms east of Stanwell Park.

SUBCLASS TELEODESMACEA

FAMILY EUCRASSATELLIDAE

*EUCRASSATELLA* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, pp. 181, 202, type species by original designation *kingicola* Lamarck.

*kingicola* Lamarck 1805, Ann. Mus. Hist. Nat. Paris, 6, p. 408.

One live specimen in 40 fathoms east of Twofold Bay.

#### FAMILY CARDITIDAE

*CARDITA* Bruguiere 1792, Tabl. Ency. Meth. Vers., 2, p. 401, type species by subsequent designation (Fleming 1818, Conchology (Encycl. Britt., Suppl. 3) p. 305) *variegata* Bruguiere.

*amabilis* Deshayes 1854, Proc. Zool. Soc. Lond., 1852, p. 102, pl. 17, figs. 8, 9.

One single valve in 65 fathoms east of Broken Bay; one single valve in 50 fathoms east of Botany Bay.

*VIMENTUM* Iredale 1925, Rec. Aust. Mus., 14, pp. 248, 254, type species by original designation *dilectum* Smith.

*cavaticum* Hedley 1902, Mem. Aust. Mus., 4, p. 318, fig. 58.

One single valve in 50 fathoms east of Broken Bay; two live specimens and four single valves in 50 fathoms east of Botany Bay.

*BATHYCARDITA* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, pp. 182, 205, type species by original designation *raouli* Angas.

*raouli* Angas 1872, Proc. Zool. Soc. Lond., 1872, p. 613, pl. 42, f. 12.

A fair number of live specimens obtained along most parts of the New South Wales coast from Port Stephens to the Victorian border, in depths from 50 to 90 fathoms.

#### FAMILY DOSINIIDAE

*MERIDOSINIA* Iredale 1930, Rec. Aust. Mus., 17, p. 394, type species by original designation *nedigna* Iredale.

*nedigna* Iredale 1930, Rec. Aust. Mus., 17, p. 394, pl. 64, figs. 4, 5.

One single valve in 45 fathoms east of Botany Bay.

#### FAMILY LIOCONCHIDAE

*NOTOCALLISTA* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, pp. 182, 210, type species by original designation *kingii* Gray.

*kingii* Gray 1826, Survey Coasts Austral. (King), 2, p. 476.

One live specimen in 76-80 fathoms east of Lake Macquarie; one live specimen in 37-40 fathoms east of Barrenjoey Light; six live specimens in 65 fathoms east of Stanwell Park; one live specimen in 45 fathoms east of Port Kembla.

#### FAMILY SOLECURTIDAE

*SOLECURTUS* Blainville 1824, Dict. Sci. Nat. (Levr.), 32, p. 351, type species by subsequent designation (Deshayes 1829, Dict. Class. d'Hist. Nat., 15, p. 482) *strigilatus* Linne.

*australis* Deshayes 1862, Proc. Zool. Soc. Lond., 1861, p. 424.

One live specimen in 75-85 fathoms N.E. of Newcastle.

#### FAMILY MACTRIDAE

*NANNOMACTRA* Iredale 1930, Rec. Aust. Mus., 17, p. 400, type species by original designation *jacksonensis* Smith.

*pusilla* A. Adams 1855, Proc. Zool. Soc. Lond., p. 226.

One live juvenile specimen in 50 fathoms east of Port Kembla.

CLASS GASTROPODA  
SUBCLASS PROSOBRANCHIA  
FAMILY TROCHIDAE

*ARCHIMINOLIA* Iredale 1929, Rec. Aust. Mus., 17, p. 170, type species by original designation *oleacea* Hedley & Petterd.

*oleacea* Hedley & Petterd 1906, Rec. Aust. Mus., 6, p. 215, pl. 37, f. 1.

One large dead specimen in 140 fathoms off Norah Head. An extremely rare species.

*CLANCULUS* Montfort 1810, Conch. Syst., 2, p. 190, type species by original designation *pharaonius* Linne.

*albugo* Watson 1885, Chall. Zool., 15, p. 75, pl. 6, f. 8.

One dead specimen in 75 fathoms east of Botany Bay.

*ASTELE* Swainson 1854, Proc. Roy. Soc. Tas., 3, p. 36, types species by monotypy *subcarinatum* Swainson.

*subcarinatum* Swainson 1854, Proc. Roy. Soc. Tas., 3, p. 36, pl. 6, figs. 1, 2.

Two dead specimens in 30 fathoms east of Lakes Entrance; one dead specimen in 45 fathoms east of Bermagui.

*Astele bularra*<sup>o</sup> sp. nov.

(Pl. 2, fig. 5.)

*Remarks:* This species is another very fine addition to the attractive shells comprising the subfamily Calliostomatinae, and the fact that this shell has also come to hand since from fairly shallow water in Moreton Bay, also off Caloundra and Broken Bay, is further indication of the number of new species which probably still await discovery on the eastern continental shelf, if and when an organised dredging expedition can be undertaken.

*Description:* Shell of medium size, regularly trochoid, umbilicus partially callused over; protoconch very small, smooth, medium brown in colour, of one whorl only, set at an oblique angle, and merging gradually into sculpture of main whorls, which number nine; sculpture cancellate in earlier whorls, the longitudinal striations becoming less pronounced until sculpture resolves itself into revolving rows of uniform beading, a double row being present on the somewhat prominent shoulders above the sutures, and four rows between each shoulder and the suture above; midway between these rows is a less prominent row of beading, with smaller ones on either side, the whole crossed by faint oblique growth lines; base slightly convex with nine prominent rows of beading and smaller rows interposed as on the upper side of whorls, and still smaller lines between these as before, the whole crossed by obliquely radiating growth striae; colour of shell pale cream shading to light luminous bronze on later whorls, on which the more prominent rows of beading stand out as white lines; last row of beading above suture has brown spots at regular intervals; base white.

Columella curved outwards and approximately parallel with outside edge of shell, aperture thus being roughly the shape of a parallelogram;

<sup>o</sup>An aboriginal word meaning "several waters".



the small umbilicus half covered by a reflected nacreous callus formed over inner lip, whilst a well defined funicle ascends spirally from base of callus into umbilicus.

*Dimensions:* Holotype, height 28 mm., major diameter 27 mm., minor diameter 24 mm.

*Type Locality:* Trawled off Cape Moreton, Q., exact depth unknown.

*Types:* Holotype registered at Australian Museum, Sydney, No. C. 63341, with one paratype; two paratypes registered at National Museum of Victoria, Melbourne, No. F. 21139; one dead specimen in author's collection from 50 fathoms east of Broken Bay, with three dead specimens from 40 fathoms east of Caloundra, Q.

*SALSIPOTENS* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 230, type species by original designation *armillatus* Wood.

*speciosa* A. Adams 1855, Proc. Zool. Soc. Lond., p. 38.

Two live specimens in 50 fathoms east of Broken Bay.

#### FAMILY TURBINIDAE

*BELLASTRAEA* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 232, type species by original designation *kesteveni* Iredale.

*kesteveni* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 232.

Two live specimens in 45 fathoms east of Botany Bay.

#### FAMILY LIOTIIDAE

*AUSTROLIOTIA* Cotton 1948, Trans. Roy. Soc. South Aust., 7 (1), p. 30, type species by original designation *botanica* Hedley.

*scalaris* Hedley 1903, Mem. Aust. Mus., 4, p. 336.

Hedley's description and Iredale's illustration published in 1936, (Rec. Aust. Mus., 19 (5), p. 287, pl. 21, f. 15), are based on the only two specimens then recorded, both with immature lips. A single mature specimen now recorded from 75 fathoms east of Broken Bay agrees in all respects with the original description and illustration, the mature mouth being perfectly circular and entire, the margin broadened by a thick varix.

#### FAMILY RISSOINIDAE

*STIVA* Hedley 1904, Proc. Linn. Soc. N.S.W., 29, p. 192, type species by original designation *ferruginea* Hedley.

*ferruginea* Hedley 1904, Proc. Linn. Soc. N.S.W., 29, p. 192, pl. 9, f. 23-25.

Six dead specimens from 50 fathoms east of Botany Bay; one in 45 fathoms east of Broken Bay.

#### FAMILY CALYPTRAEIDAE

*SIGAPATELLA* Lesson 1830, Zool. Coquille, 2, p. 389, type species by subsequent designation (Dall 1909, U.S. Geol. Survey Prof. pap., 591, p. 82) *novaezelandiae* Lesson.

*calyptraeformis* Lamarck 1822, Hist. Anim. s. Vert., 7, p. 12.

One dead specimen in 37-40 fathoms east of Barrenjoey Light; one alive in 45 fathoms east of Botany Bay; one dead and two live

specimens in 45 fathoms east of Port Kembla attached to dead shells.

*CAPULUS* Montfort 1810, Conch. Syst., 2, p. 54, type species by original designation *hungaricus* Linne.

*devotus* Hedley 1904, Proc. Linn. Soc. N.S.W., 29, p. 190, pl. 8, f. 15-16.

Seven dead specimens in unknown depth south of Cape Moreton; four live specimens in 156-160 fathoms east of Newcastle; three live specimens in 100-126 fathoms 40 miles E.N.E. of Sydney; a number of live specimens taken in 70 fathoms and over, east of Broken Bay, mostly attached to inner lip of dead *Cymatona kampylum* Watson; two live specimens in 85 fathoms east of Stanwell Park.

*Capulus sycophanta* sp. nov.

(Pl. 2, figs. 1a, b.)

*Remarks:* In common with a number of shells in the past, this appears to be yet another instance of one which has been known to local fishermen and others for many years but apparently never forwarded to a Museum for identification. A study of the animal has not yet been carried out, but it is apparently parasitic in habit, as in addition to adhering to the shell of the common *Amusium balloti* Bernardi, in every adherent specimen received a hole has been bored into the host shell, varying in size from about  $\frac{1}{8}$ " to  $\frac{3}{16}$ ". The shell invariably adheres with the beak pointing approximately in the direction of the umbonal area of the host, the hole drilled close to the left hand margin of its own shell. This new species is strongly reminiscent of *Capulus dilatatus* A. Adams, from Japan.

*Description:* Shell large for the family, sub-circular in outline, fairly well elevated; nucleus smooth and well recurved, sometimes straight but can be inclined to right or left, usually level with edge of shell or projecting a little beyond it; sculpture of numerous fine radiating striae, commencing at base of beak, and extending to margin in every direction, in some cases commencing on beak itself, and crossed by irregular growth lines.

Colouration light fawn background with light pinkish-brown radiating rays, usually a pink tinge on beak; interior quite smooth and polished, sometimes pure white with pink edge, often flushed with carmine; a light fawn periostracum present over whole outer surface.

*Dimensions:* Holotype, length 37 mm., breadth 33 mm., height 14 mm.

*Type Locality:* Trawled in 25 fathoms in Keppel Bay.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63342, with several paratypes; several paratypes in author's collection, others presented to National Museum of Victoria.

FAMILY CERITHIIDAE

~~ATAXOCERITHIUM~~ Tate 1894, Jour. Roy. Soc. N.S.W., 32, p. 179, type species by original designation *serotinum* A. Adams 1855.

*applanum* Iredale 1936, Rec. Aust. Mus., 19 (5), p. 291, pl. 21, f. 19.

Two live specimens in 50 fathoms east of Lakes Entrance.

#### FAMILY TURRITELLIDAE

**GAZAMEDA** Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 247, type species by original designation *gunnii* Reeve.

*gunnii* Reeve 1849, Conch. Icon., 5, pl. 9, f. 45.

Found in fair numbers in 40 to 100 fathoms from Broken Bay to Port Kembla; two in 35 fathoms S.E. of Lakes Entrance.

*tasmanica* Reeve 1849, Conch. Icon., 5, pl. 9, f. 42.

Two dead specimens east of Broken Bay; seven dead specimens in 40 to 70 fathoms east of Port Kembla; three dead specimens east of Bermagui; three dead specimens in 35 fathoms S.E. of Lakes Entrance.

*decoramen* Iredale 1936, Rec. Aust. Mus., 19, (5), p. 292, pl. 21, f. 20.

Three dead specimens east of Botany Bay.

**PLATYCOLPUS** Donald 1900, Proc. Mal. Soc. Lond., 4, p. 54, type species by original designation *quadratus* Donald.

*quadratus* Donald 1900, Proc. Mal. Soc. Lond., 4, p. 54, pl. 5, f. 8, 8b.

Five dead specimens in 40 fathoms east of Twofold Bay.

#### FAMILY ZEMIRIDAE

**ZEMIRA** H. & A. Adams 1853, Gen. Rec. Moll., p. 110, type species by monotypy *australis* Sowerby.

*australis* Sowerby 1841, Conch. Illustr., p. 20, List 8, f. 5.

One live specimen in 73-80 fathoms east of Lake Macquarie; one dead specimen in 75 fathoms east of Stanwell Park; one live specimen S.E. of Lakes Entrance.

#### FAMILY XENOPHORIDAE

**XENOPHORA** Fischer 1807, Mus. Demidoff., 3, p. 213, type species by monotypy *laevigata* G. Fischer (= *conchyliophora* Born).

*peroniana* Iredale 1929, Rec. Aust. Mus., 17 (4), p. 172.

Found in fair quantities from Port Stephens to Bass Strait in varying depths up to 100 fathoms, and one of the commonest shells trawled off the N.S.W. coast during the survey.

#### FAMILY STROMBIDAE

**LAMBIS** Röding 1798, Mus. Bolten, 2, p. 61, type species by tautonymy *lambis* Linne.

*lambis* Linne 1758, Syst. Nat., Ed. 10, p. 743.

One juvenile specimen east of Broken Bay, depth unknown.

#### FAMILY EPITONIIDAE (SCALIDAE)

**DANNEVIGENA** Iredale 1936, Rec. Aust. Mus., 19 (5), p. 303, type species by original designation *martyr* Iredale.

*martyr* Iredale 1936, Rec. Aust. Mus., 19 (5), p. 303, pl. 22, f. 25.

Three dead specimens in 70 fathoms east of Stanwell Park.

FAMILY CYMATIIDAE

*CHARONIA* Gistel & Bromme 1847, Handb. Naturg., p. 559, type species by monotypy *tritonis* Linne.

*euclia instructa* Iredale 1929, Rec. Aust. Mus., 17 (4), p. 172, pl. 41, f. 5.

Four immature live specimens in 50 fathoms east of Broken Bay.

*CABESTANIMORPHA* Iredale 1936, Rec. Aust. Mus., 19, p. 307, type species by original designation *exarata* Reeve (= *tabulata* Menke).

*tabulata* Menke 1843, Spec. Moll. Nov. Holl., p. 25.

Trawled in fair numbers and in varying depths from Newcastle to Port Kembla.

*zimara* Iredale 1929, Aust. Zool., 5 (4), p. 345, pl. 38, f. 11.

Two dead specimens east of Broken Bay; one dead specimen east of Bermagui.

*MONOPLEX* Perry 1811, Conch., pl. 3, type species by subsequent designation (Clench & Turner 1957, *Johnsonia*, 3, p. 227) *australasiae* Perry.

*australasiae* Perry 1811, Conch., pl. 4, f. 2, 4.

One dead specimen N.N.E. of Cape Byron.

*CYMATONA* Iredale 1929, Rec. Aust. Mus., 17, p. 177, type species by original designation *kampyla* Watson.

*kampyla* Watson 1885, Jour. Linn. Soc. Zool., 16, p. 594.

Found in fair numbers, all dead specimens, in depths of 70 fathoms and over from Newcastle to Stanwell Park, a number having *Capulus devotus* Hedley attached, always to inner lip.

*PHANOZESTA* Iredale 1936, Rec. Aust. Mus., 19 (5), p. 309, type species by original designation *remensa* Iredale.

*remensa* Iredale 1936, Rec. Aust. Mus., 19 (5), p. 309, pl. 23, f. 4.

Found in fair numbers in 70 fathoms and over off Broken Bay and Botany Bay, those from former locality all being taken alive, those from latter locality all dead specimens.

*FUSITRITON* Cossman 1903, Essai Paleo. comp., 5, p. 87, type species by original designation *cancellatus* Lamarck.

*retiolus* Hedley 1914, Biol. Res. Endeav., 2, p. 73, pl. 11, f. 5.

Two dead specimens in 75 fathoms east of Broken Bay; one in 120-125 fathoms east of Manly.

*AUSTROSASSIA* Finlay 1931, Trans. New Zeal. Inst., 62, p. 7, type species by original designation *parkinsonia* Perry.

*parkinsonia basilica* Iredale 1924, Proc. Linn. Soc. N.S.W., 49 (3), p. 253, pl. 35, f. 4.

Four dead specimens east of Botany Bay; one east of Port Kembla.

MAYENA Iredale 1917, Proc. Malac. Soc., 12, p. 324, type species by original designation *australasia* Perry.

*australasia* Perry 1811, Conch., pl. 4, figs. 2, 4.

One dead specimen east of Bermagui.

*australasia benthicola* Iredale 1929, Rec. Aust. Mus., 17 (4), p. 174, pl. 41, f. 4.

Trawled in fair numbers east of Broken Bay, Botany Bay and Port Kembla.

DISTORSIO Röding 1798, Mus. Bolten, 2, p. 133, type species by subsequent designation (Pilsbry 1922, Proc. Acad. Nat. Sci. Philad., 73, p. 357) *anus* Linne.

*francesae* Iredale 1931, Rec. Aust. Mus., 18 (4), p. 213, pl. 23, f. 2.

One dead specimen off Cape Moreton; one dead specimen east of Broken Bay; one dead specimen east of Port Kembla.

BURSA Röding 1798, Mus. Bolten, 2, p. 128, type species by subsequent designation (Jousseume 1881, Bull. Soc. Zool. France, 6, p. 175) *bufonia* Gmelin.

*Bursa latitudo* sp. nov.

(Pl. 2, fig. 2.)

*Remarks:* In common with many other shells from fairly deep water, this species is thinner and lighter in weight than others of the family of comparable size, and the possibility that it only inhabits the waters beyond the edge of the continental shelf could account for its not being previously discovered by trawling.

*Description:* Shell of fair size, light in weight, less nodular than most of the genus; protoconch of  $3\frac{1}{2}$  whorls, first of which is planate, smooth, and terminates abruptly before commencement of main whorls, which number six; varices ten, sculpture consisting of very fine numerous revolving striae, with a row of fairly prominent nodules in centre of each whorl, a second row visible in places at the base of each whorl, at times covered by sutures, whilst a third rather obsolete row shows towards anterior end of body whorl; aperture sub-circular, outer lip thickened and dentate within, a fairly heavy callus formed over inner lip and finely wrinkled; canal short, open and recurved; a well defined posterior sinus present with a fairly prominent ridge adjoining on inner lip; colour light fawn with small patches of brown on nodules and varices; whole of aperture and interior pure white.

*Dimensions:* Holotype, length 95 mm., breadth 55 mm., length of aperture, excluding posterior sinus, 26 mm.

*Type Locality:* Trawled in 125 fathoms off Moreton Is., Q.

*Type:* Holotype registered at National Museum of Victoria, Melbourne, No. F. 21111; one small and badly damaged paratype registered at the Australian Museum, No. C. 63353.

## FAMILY CASSIDIDAE

- XENOGALEA* Iredale 1927, Rec. Aust. Mus., 15 (5), p. 339, type species by original designation *pyrum* Lamarck.  
*insperata* Iredale 1927, Rec. Aust. Mus., 15 (5), p. 349, pl. 31, f. 8.  
 One dead specimen in 50 fathoms off Broken Bay; one dead specimen in 45 fathoms off Stanwell Park.
- thomsoni* Brazier 1875, Proc. Linn. Soc. N.S.W., 1, p. 8.  
 One live specimen in 110-115 fathoms N.E. of Newcastle; one live specimen in 95 fathoms east of Tuggerah; four live specimens in 60 fathoms east of Broken Bay; five live specimens in 60 fathoms east of Botany Bay; two live specimens in 50 fathoms east of Stanwell Park.
- pyrum* Lamarck 1822, Hist. Anim. s. Vert., 7, p. 226.  
 Two live specimens in 60 fathoms east of Broken Bay; one live specimen in 60 fathoms east of Botany Bay.
- NANNOCASSIS* Iredale 1927, Rec. Aust. Mus., 15 (5), p. 328, type species by original designation *nana* Tenison-Woods.  
*nana* Tenison-Woods 1879, Proc. Linn. Soc. N.S.W., 4, p. 108.  
 Three dead specimens off Cape Moreton, three south of Cape Moreton, one off Moreton Is., depths unknown.
- SEMICASSIS* Morch 1852, Cat. Conch. Yoldi., 1, p. 112, type species by subsequent designation (Harris 1897, Cat. Tert. Moll. Brit. Mus., 1, p. 198) *japonica* Reeve.  
*diuturna* Iredale 1927, Rec. Aust. Mus., 15 (5), p. 335, pl. 32, f. 9  
 Two dead specimens off Cape Moreton, unknown depth.

### *Pulchroniscia delecta* gen. et sp. nov.

(Pl. 1, figs. 9a, b.)

*Remarks:* A very fine new species was trawled in 75 fathoms east of Botany Bay, which although not an actual Cassid form is placed in this family for the present as being the closest available. Related to *Oniscidia cancellata* Sowerby from China, which was recently trawled in Queensland.

Generic characteristics are the pyriform shape, acuminate spire, heavy reflected and denticulate outer lip, and strong axial plications.

*Description:* Shell pyriform in shape, spire fairly acuminate, main whorls five; protoconch of three whorls, exerted, smooth and translucent; aperture produced posteriorly, at maturity level with shoulder of preceding whorl and 72% of total length of shell; outer lip thickened and recurved, finely denticulate within; a heavy callus over inner lip extending onto main body whorl, finely denticulate at posterior end, merging into an irregular row of small nodules at anterior end; sculpture of strong axial plications, slightly spinose on shoulders and weakening towards anterior end, there being sixteen on main body whorl; fairly fine growth striae in interstices and over-riding the plications, the whole crossed by

fairly strong concentric ridges; colour a blending of pale cream to fawn, giving a slightly banded appearance, four light brown patches on re-curved edge of outer lip, and a narrow brown blotch in centre of columella.

*Dimensions:* Holotype, length 40 mm., breadth 26 mm., length of aperture 29 mm.

*Type Locality:* Dredged in 75 fathoms east of Botany Bay, N.S.W.

*Type:* The holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63343.

#### FAMILY TONNIDAE

*TCNNA* Brunnich 1772, Zool. Fund., p. 248, type species by monotypy *galea* Linne.

*tetracotula* Hedley 1919, Rec. Aust. Mus., 12, p. 332, pl. 42-43, f. 4-5.

Two dead specimens off Cape Moreton, depth unknown.

*EUDOLIUM* Dall 1889, Bull. Mus. Comp. Zool. (Harvard), 18, pp. 20, 232, type species by original designation *crossceanum* Monterosato.

*pyriforme* Sowerby 1914, Ann. Mag. Nat. Hist., (8), 14, p. 37, pl. 2, f. 14.

One dead specimen in 75 fathoms east of Broken Bay.

#### FAMILY FICIDAE

*FICUS* Röding 1798, Mus. Bolten, 2, p. 148, type species by tautonymy *ficus* Gmelin.

*filosus* Sowerby 1893, Conchologist, 2, p. 74.

Two live specimens in 75 fathoms east of Broken Bay.

*Remarks:* Although the type locality for this species is given as Hong Kong, and to the author's knowledge it has not been recorded previously from the Australian coast, the two specimens now recorded agree well with the original description. Moreover the general outline and sculpture appear to be identical with the excellent photographs by Kuroda and Habe in Illustrated Catalogue of Japanese Shells, No. 19, 1952, p. 134. There appears no reason therefore to re-name the shells now recorded merely because of the distance from the type locality.

This is not the common species usually called *communis* Röding from the east coast of Australia, which in any case is probably *Ficus ficoides* Lamarck, and of which *Ficus margaretae* Iredale (Rec. Aust. Mus., 18 (4), 1931, p. 216, pl. 23, f. 4) must be regarded as a synonym.

#### FAMILY NATICIDAE

*NOTOCOCHLIS* Powell 1933, Trans. New Zeal. Inst., 63, p. 166, type species by original designation *migratcria* Powell.

*luculenta* Iredale 1929, Rec. Aust. Mus., 17, p. 179, pl. 40, f. 10.

Two dead specimens in 70 fathoms east of Broken Bay; three dead specimens from 70 fathoms east of Stanwell Park; one dead specimen in 50 fathoms east of Port Kembla.

*POLINICES* Montfort 1810, Conch. Syst., 2, p. 222, type species by original designation *albus* Montfort = *mamilla* Linne.

*Polinices putealis* sp. nov.

(Pl. 2, fig. 6.)

*Remarks:* It appears remarkable that the shell here described should have remained undiscovered for so long, being in a locality which has been trawled for so many years, and ten specimens were received from the "Challenge" on one trip to the area. It cannot be confused with any other species, being pure white and shining, with the umbilicus extending right through to the spire of shell.

*Description:* Shell solid, helicoid, very glossy; pure white, carrying traces of a light fawn and very thin periostracum; whorls five, slowly increasing, the last half whorl descending and expanding rapidly; spire small and acute; aperture oblique, semi-lunate and nearly half total breadth; callus narrow with very small lobe extending slightly across the wide umbilical opening, which narrows gradually as it extends through to spire of shell.

*Dimensions:* Holotype, length 27 mm., breadth 22 mm., length of aperture 17 mm.

*Type Locality:* Trawled in 50-58 fathoms east of Botany Bay.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63344 with two paratypes; three paratypes presented to National Museum of Victoria, Melbourne, and four paratypes in author's collection.

CAMS #C.82411

*FRIGINATICA* Hedley 1915, Aust., Antarc. Exped., 1911-14, Sci. Rep., 4, p. 57, type species by original designation *beddomei* Johnston.

*beddomei* Johnston 1885, Proc. Roy. Soc. Tas., 1884, p. 222 (= *effossa*

Watson 1886, Rep. Sci. Res. Challenger Zool., 15, p. 439, pl. 28, f. 3).

One dead specimen in 45 fathoms east of Botany Bay.

*PROPESINUM* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 256, type species by monotypy *umbilicatum* Quoy & Gaimard.

*umbilicatum minusculum* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 256.

(Pl. 2, fig. 3.) Not previously figured.

One live specimen in 45 fathoms east of Botany Bay, Australian Museum, No. C. 63354.

#### FAMILY LAMELLARIIDAE

*MYSTICONCHA* Allan 1936, Rec. Aust. Mus., 19, p. 393, type species by original designation *wilsoni* Smith.

*wilsoni* Smith 1886, Ann. Mag. Nat. Hist., (5) 18, p. 270 and figure.

One live specimen in 35 fathoms S.E. of Newcastle.



#### FAMILY TRIVIIDAE

*ELLATRIVIA* Iredale 1931, Rec. Aust. Mus., 18, p. 221, type species by original designation *merces* Iredale.

*merces addenda* Iredale 1931, Rec. Aust. Mus., 18, p. 221. Not figured.

One live specimen in 37-40 fathoms east of Barrenjoey Light; two live specimens in 50 fathoms S.E. of Lakes Entrance.

#### FAMILY UMBILIIDAE

*UMBILIA* Jousseume 1884, Le Naturaliste, 6th year, p. 414, type species by monotypy *umblicata* Sowerby (= *hesitata* Iredale).

*hesitata* Iredale 1916, Proc. Malac. Soc., 12, p. 93.

Found in large numbers alive in depths from 25 to 100 fathoms from vicinity of Port Stephens to Bass Strait. The belief that mature shells decrease in size as the northern limit of their range is reached (subspecies *beddomei* Schilder 1930) cannot be sustained, as fully mature shells ranging in length from 101 mm. down to 51 mm. were obtained throughout the full length of this range.

#### FAMILY CYPRAEIIDAE

*SOLVADUSTA* Iredale 1935, Aust. Zool., 8, p. 217, type species by original designation *vaticina* Iredale.

*subviridis* Reeve 1835, Proc. Zool. Soc. Lond., p. 68, and Conch. Icon., 3, 1845, *Cypraea*, pl. 12, f. 48.

One live specimen off Moreton Is.

*VOLVA* Röding 1798, Mus. Bolten, 2, p. 21, type species by tautonymy *volva* Linne.

*volva* Linne 1758, Syst. Nat. Ed., 10, p. 725.

One live specimen N.N.E. of Cape Byron.

#### FAMILY VOLUTIDAE

*CYMBIOLISTA* Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *hunteri* Iredale.

*hunteri* Iredale 1931, Rec. Aust. Mus., 18, p. 223.

One dead specimen off Cape Moreton; one dead specimen N.N.E. of Cape Byron.

*CYMBIOLACCA* Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *complexa* Iredale.

*complexa* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 258.

Two dead specimens N.N.E. of Cape Byron, N.S.W.

*pulchra pulchra* Sowerby 1825, Cat. Tankerville, App. p. 28, pl. 4, f. 2.

Three dead specimens east of Cape Moreton, Q., and four dead specimens south of same locality.

*ERICUSA* H. & A. Adams 1858, Gen. Rec. Moll., 2, p. 619, type species by subsequent designation (Cotton & Godfrey 1932, South Aust. Nat., 13, p. 49) *fulgetrum* Sowerby.

*papillosa kenyoniana* Brazier 1898, Proc. Linn. Soc. N.S.W., 22, p. 779.

One dead immature specimen in 90-100 fathoms east of Tuggerah Lakes.

*sericata* Thornley 1951, Proc. Roy. Zool. Soc. N.S.W., 1949-50, p. 53, figs. in text.

One large dead specimen in 50 fathoms east of Laurieton (in collection of Mr. Evans Paddon); one dead specimen off Cape Moreton; one off Moreton Is.

*MESERICUSA* Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *sowerbyi perspecta* Iredale.

*sowerbyi perspecta* Iredale 1929, Rec. Aust. Mus., 17, p. 181, pl. 41, f. 9.

One small dead specimen, deeply coloured, in 90-100 fathoms east of Tuggerah Lakes; two similar small dead specimens in 50 fathoms east of Broken Bay; one large dead specimen east of Bermagui.

*NANNAMORIA* Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *amicula* Iredale.

*amicula* Iredale 1929, Rec. Aust. Mus., 17, p. 181, pl. 40, f. 4.

Two dead specimens in 70 fathoms east of Broken Bay, and it is understood that a third specimen was obtained from the same area. Owing to the worn nature of the type specimen of this rare shell, opportunity is now taken to describe the colour as being a pale fawn background, with undulating longitudinal chestnut lines. A row of chestnut blotches encircles the body whorl, with chestnut splashes below the sutures.

*parabola* Garrard 1960, Jour. Mal. Soc. Aust., 4, p. 3, pl. 1, f. 1a, b.

One dead mature specimen and two immature specimens from 125 fathoms off Moreton Is., Q.

*AMORENA* Iredale 1929, Rec. Aust. Mus., 17, p. 180, type species by original designation *undulata* Lamarck.

*undulata* Lamarck 1804, Ann. Mus. Hist. Nat. Paris, 5, p. 157, pl. 12, f. 1.

Found in fair quantities from Newcastle to Broken Bay area, mostly small and immature. It would seem from experience that the larger live specimens probably burrow too deeply to be brought up in the nets, especially during daylight hours; one dead specimen also from N.N.E. of Cape Byron.

**RELEGAMORIA** Iredale 1936, Rec. Aust. Mus., 19, p. 314, type species by original designation *molleri* Iredale.

*molleri* Iredale 1936, Rec. Aust. Mus., 19, p. 314, pl. 23, f. 10.

It is known that at least 30 live specimens were trawled between Newcastle and Broken Bay, in depths from 90 to 120 fathoms, mainly just over the edge of the continental shelf; one also N.N.E. of Cape Byron, N.S.W. Study of these shells reveals that the white glaze on the holotype as described by Iredale is not typical, all shells being a uniform light brown in colour and highly polished, whilst the peculiar ridge on the inside of the outer lip is present in all mature specimens and is not an aberration.

**ZEBRAMORIA** Iredale 1929, Rec. Aust. Mus., 17, p. 180, type species by original designation *zebra* Leach.

*zebra* Leach 1814, Zool. Miscell., 1, p. 31, pl. 12, f. 1.

Two live specimens off Cape Moreton.

**TERNIVOLUTA** Martens 1897, Arch. fur Naturg., 63, p. 177, type species by original designation *studerii* Martens.

*studerii* Martens 1897, Arch. fur Naturg., 63, p. 177-8, pl. 17, f. 2.

At least 60 specimens are known to have been trawled in depths down to 125 fathoms off Moreton Is., many being alive.

#### FAMILY MICROVOLUTIDAE

**MICROVOLUTA** Angas 1877, Proc. Zool. Soc. Lond., 1877, p. 34, type species by monotypy *australis* Angas.

*royana* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 269, pl. 35, f. 13.

One dead specimen in 50 fathoms east of Botany Bay.

#### FAMILY MITRIDAE

**VICIMITRA** Iredale 1929, Aust. Zool., 5, p. 343, type species by monotypy *prospora* Iredale.

*prospora* Iredale 1929, Aust. Zool., 5, p. 343, pl. 38, f. 17.

One dead specimen off Cape Moreton; one dead specimen in 50 fathoms east of Broken Bay; two dead specimens in 45 fathoms east of Botany Bay.

**AUSTROMITRA** Finlay 1927, Trans. New Zeal. Inst., 57, p. 410, type species by original designation *rubiginosa* Hutton.

*strangei* Angas 1867, Proc. Zool. Soc. Lond., 1867, p. 110, pl. 13, f. 4.

One dead specimen east of Botany Bay.

#### FAMILY HARPIDAE

**PALAMHARPA** Iredale 1931, Rec. Aust. Mus., 18, p. 230, type species by original designation *exquisita* Iredale.

*exquisita* Iredale 1931, Rec. Aust. Mus., 18, p. 230, pl. 22, f. 8.

One dead specimen off Botany Bay; several fine dead specimens off Twofold Bay-Gabo Is. area; one live specimen in 33 fathoms off Deal Is., Bass Strait.

#### FAMILY OLIVIDAE

*BELLOLIVA* Peile 1922, Proc. Malac. Soc., 15, p. 18, type species by original designation *brazieri* Angas.

*leucozona brazieri* Angas 1877, Proc. Zool. Soc. Lond., 1877, p. 172, pl. 26, f. 6.

Two live specimens in 45 fathoms east of Botany Bay.

*CUPIDOLIVA* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 259, type species by original designation *nympha* A. Adams & Angas.

*nympha* A. Adams & Angas 1864, Proc. Zool. Soc. Lond., 1863, p. 422.

Three dead specimens off Botany Bay.

#### FAMILY ANCILLIDAE

*ANCILLISTA* Iredale 1936, Rec. Aust. Mus., 19, p. 314, type species by original designation *velesiana* Iredale.

*velesiana* Iredale 1936, Rec. Aust. Mus., 19, p. 314, pl. 23, f. 9.

One live specimen off Cape Moreton; one live specimen in 76-80 fathoms off Lake Macquarie.

*ALOCOSPIRA* Cossman 1899, Essais Paleo. comp. livr., 3, p. 92, type species by original designation *papillata* Tate.

*oblonga* Sowerby 1830, Spec. Conch., *Ancillaria*, p. 7, pl. 13, f. 38-9.

Five dead specimens off Port Kembla.

*marginata tasmanica* Teaison-Woods 1878, Proc. Roy. Soc. Tas., 1877, p. 30.

Two dead specimens in 45 fathoms east of Twofold Bay.

*fusiformis gaza* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 261, pl. 36, f. 9.

Two dead specimens in 50 fathoms east of Port Kembla; one dead specimen east of Bermagui.

#### FAMILY MARGINELLIDAE

*OVAGINELLA* Laseron 1957, Aust. Jour. Mar. Freshwater Res., p. 280, type species by original designation *ovulum* Sowerby.

*ovulum* Sowerby 1846, Thes. Conch., 1, p. 401, pl. 78, f. 188.

Three dead specimens off Botany Bay.

*whani* Pritchard & Gatliff 1900, Proc. Roy. Soc. Vic., 13, (n.s.), p. 137, pl. 21, f. 5-6.

One dead specimen off Botany Bay.

*SINUGINELLA* Laseron 1957, Aust. Jour. Mar. Freshwater Res., 8, p. 282, type species by original designation *inconspicua* Sowerby.

*punicea* Laseron 1948, Rec. Aust., Mus., 22, p. 38, pl. 5, f. 7.

Three dead specimens off Botany Bay.

*binivitta* Laseron 1948, Rec. Aust. Mus., 22, p. 39, pl. 5, f. 11.

Three dead specimens off Botany Bay.

KOGOMEA Habe 1951, Illus. Cat. Jap. Shells, (ed. T. Kuroda), p. 103, f. 11, type species by original designation *novem-provincialis* Yokoyama.

*stilla* Hedley 1903, Mem. Aust. Mus., 4, p. 367, f. 90.

Three dead specimens in 50 fathoms off Botany Bay.

PROTOGINELLA Laseron 1957, Aust. Jour. Mar. Freshwater Res., 8, p. 285, type species by original designation *lavigata* Brazier.

*geminata* Hedley 1912, Rec. Aust. Mus., 8, p. 145, pl. 42, f. 28.

One live specimen off Botany Bay.

#### FAMILY CANCELLARIIDAE

SYDAPHERA Iredale 1929, Aust. Zool., 5, p. 341, type species by original designation *renovata* Iredale.

*anxifer* Iredale 1925, Rec. Aust. Mus., 14, p. 264, pl. 43, f. 24.

One dead specimen in 45 fathoms east of Port Kembla.

#### FAMILY ARCHITECTONICIDAE

ARCHITECTONICA Röding 1798, Mus. Bolten, 2, p. 78, type species by subsequent designation (Gray 1847, Proc. Zool. Soc. Lond., p. 151) *perspectiva* Linne.

*offixa* Iredale 1931, Rec. Aust. Mus., 18, p. 229, pl. 25, figs. 15-16.

One dead specimen in 90-100 fathoms east of Tuggerah Lakes; one live specimen in 72 fathoms off Point Newcastle; four live specimens off Broken Bay, depth unknown; three live specimens off Stanwell Park and three off Port Kembla, depths unknown.

*grandiosa* Iredale 1931, Rec. Aust. Mus., 18, p. 228, pl. 25, f. 19-20.

One dead specimen off Cape Moreton.

*Russetia dilaniatus* gen. et sp. nov.

(Pl. 1, figs. 11a, b.)

*Remarks:* The outstanding characteristic of this new genus is the rough and irregular nature of the peripheral keel in the later whorls, coupled with the peculiar base, convex in the centre and flattening towards the edges, otherwise the general appearance of the shell is fairly typical of the family.

*Description:* Shell depressed, of seven slightly concave whorls; planate protoconch; base convex, flattening towards periphery and umbilicus; umbilicus large and perspective, one-third total width of shell; edges finely beaded in earlier whorls, becoming rough and irregular as main whorl is reached; peripheral keel simple, becoming rough and irregular as maturity is reached, overlapping the suture in a more pronounced fashion with each succeeding whorl; sculpture of about nine fine spiral lirae below suture, followed by six further lirae of irregular widths towards peripheral keel, the whole over-ridden by fine growth lines; sculpture of base consists of three fairly prominent beaded ridges adjoining umbilicus, followed by two flattened ridges and numerous finer ridges towards periphery, the

whole crossed by fairly pronounced growth striae; columella sinuate and aperture narrows towards keel; colour very light fawn, base white.

*Dimensions:* Holotype, major diameter 43 mm., minor diameter 37 mm., height 16 mm.

*Type Locality:* Trawled in 160 fathoms east of Newcastle.

*Type:* Holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63345.

#### FAMILY FASCIOLARIIDAE

*PLEIA* Finlay 1930, Trans. New Zeal. Inst., 61, p. 60, type species by original designation *decepiens* Tate.

*bakeri* Gatliff & Gabriel 1912, Vict. Nat., 29, No. 3, p. 47, pl. 4, f. 5.

A fair number of live specimens in depths from 35 to 60 fathoms from Broken Bay to Twofold Bay.

#### FAMILY FUSINIDAE

*FUSINUS* Rafinesque 1815, Analyse Natur., p. 145, new name for *Fusus* Lamarek 1799, (not *Fusus* Helbling 1779), type species by monotypy *colus* Linne.

*novaezollandiae* Reeve 1848, Conch. Icon., 4, *Fusus*, pl. 18, f. 70.

Three fine specimens from 45 fathoms off Port Kembla, all very nodular and heavy; one dead specimen off Twofold Bay.

*novaezollandiae grandiculus* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 267, pl. 34, f. 9.

Many specimens obtained along most of N.S.W. coast from Norah Head southwards in various depths up to 160 fathoms and in various stages of growth.

*PROPEFUSUS* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 268, type species by monotypy *pyrulatus* Reeve.

*pyrulatus* Reeve 1847, Conch. Icon., 4, *Fusus*, pl. 3, figs. 50, 50a.

One immature specimen in 60 fathoms east of Port Kembla; one dead specimen off Broken Bay.

#### FAMILY AUSTROSIPHONIDAE

*LARGISIPHO* Iredale 1929, Rec. Aust. Mus., 17, p. 182, type species by original designation *spectandus* Iredale.

*maximus* Tryon 1881, Man. Conch., 3, p. 135, pl. 54, f. 355.

Fairly numerous in depths from 30 to 125 fathoms from Port Stephens to Bass Strait.

*BERYLSMA* Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 267, type species by original designation *waitiei* Hedley.

*waitiei* Hedley 1903, Mem. Aust. Mus., 4, p. 373, pl. 37.

Seven live specimens in 75 fathoms off Broken Bay-Newcastle area.

FAMILY COLUBRARIIDAE

*COLUBRARIA* Schumacher 1817, Essai nouv. syst. Vers. test. p. 251, type species by monotypy *granulata* Schumacher.

*Colubraria fantomei* sp. nov.

(Pl. 1, fig. 5.)

*Remarks:* A most interesting addition to this somewhat difficult group was trawled in 40 fathoms east of Caloundra and is typical of the genus, bearing a strong resemblance to *Colubraria comptus* Sowerby but with finer sculpture. Three specimens were recently obtained, and whilst from another source not connected with "Challenge" material, it is considered that the species should be included with this list in view of the further species later described, trawled by m.v. "Challenge" off Broken Bay, N.S.W., in order to show the essential differences.

*Description:* Shell a typical *Colubraria*, spire longer than aperture, whorls convex, sutures impressed; one smooth whorl of protoconch only present, upper whorls missing, and this merges imperceptibly into sculpture of main whorls, which number eleven on holotype in addition to protoconch; varices number eighteen, spaced a little more than half a whorl apart, gradually increasing in distance until outer lip on last whorl is almost level with previous varix; aperture 40% of total length of shell, outer lip expanded and recurved, extended a little over previous whorl, finely dentate within, teeth being prolonged well into aperture; columella smooth and sinuate, inner lip much expanded and reflected; anterior canal open and well recurved; a rather obsolete ridge at top of columella suggests a posterior canal; sculpture of fairly fine revolving lirae, crossed by longitudinal striations which are slightly more prominent, giving a general granulated appearance; colouration pale fawn, with slightly darker fawn band in centre of each whorl, forming a dark patch on lower end of each varix; broken irregular revolving brown lines persist in addition over entire shell.

*Dimensions:* Holotype, length 75 mm., breadth 28 mm., length of aperture 30 mm. The two smaller specimens, both apparently mature, measure 58 mm. long and 22 mm. wide.

*Type Locality:* All specimens trawled in 40 fathoms east of Caloundra, Q.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63346, one paratype presented to National Museum of Victoria, Melbourne; further paratype in author's collection.

*Colubraria myuna*<sup>o</sup> sp. nov.

(Pl. 1, fig. 6.)

*Remarks:* Whilst it is always preferable to have a series of shells for study before describing a new species, and whilst the shell here described is fairly close in many ways to the species described above, it is considered that the differences are such as to warrant separation.

*Description:* Species essentially the same in general characteristics as *Colubraria fantomei* and may be described as a degenerate form, main

<sup>o</sup>An aboriginal word meaning "clear water".

difference being that shell is a considerably smaller species, sculpture less pronounced, tending to decrease more in prominence with each succeeding whorl, this being especially noticeable on varices; although whorls are also convex, sutures are not so impressed, teeth are not produced into interior of aperture, and anterior canal is less recurved; protoconch of three smooth tightly coiled whorls; small columella ridge is absent; colouration very similar to *fantomei* but markings paler and less pronounced.

*Dimensions.* Holotype, length 41 mm., breadth 15½ mm., length of aperture 17 mm.

*Type Locality:* Trawled in 75 fathoms east of Broken Bay, N.S.W.

*Type:* Holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63347.

*BENTHINDSIA* Iredale 1936, Rec. Aust. Mus., 19, p. 317, type species by original designation *problematica* Iredale.

*problematica* Iredale 1936, Rec. Aust. Mus., 19, p. 318, pl. 23, f. 7.

Found in fair numbers from 70 fathoms and over off Broken Bay, all dead specimens; one dead specimen off Botany Bay; four dead specimens off Stanwell Park, depths unknown.

#### FAMILY MURICIDAE

*PTEROCHELUS* Jousseaume 1879, Le Naturaliste, 1, No. 42, p. 335, type species by original designation *acanthopterus* Lamarck.

*acanthopterus* Lamarck, 1816, Encycl. Meth., vers., pl. 417, f. 2.

One live specimen off Moreton Is., depth unknown.

*duffusi* Iredale 1936, Rec. Aust. Mus., 19, p. 323, pl. 23, f. 11.

A number of fine specimens obtained, many alive, in fairly deep water from Newcastle to Twofold Bay.

*damicornis* Hedley 1903, Mem. Aust., Mus., 4, p. 378, f. 92.

Proved to be extremely common and brought up in quantities from Newcastle Bight to Twofold Bay, more particularly from Broken Bay to Port Kembla area, in varying depths from 35 to 126 fathoms; nine specimens also off Cape Moreton, in unknown depth.

*HAUSTELLUM* Schumacher 1817, Essai nouv. syst. Vers. test., pp. 64 & 213, type species by tautonymy *Murex haustellum* Linne.

*espinosus* Macpherson 1959, Mem. Nat. Mus. Melb., p. 51, pl. on p. 56, figs. 1, 1a.

Two dead specimens off Cape Moreton, depth unknown; two dead specimens in unknown depth N.N.E. of Cape Byron.



*TORVAMUREX* Iredale 1936, Rec. Aust. Mus., 19, p. 323, type species by original designation *denudatus* Perry.

*denudatus* Perry 1811, Conchology, pl. 7, f. 2.

One live specimen in 33 fathoms off Deal Is., Bass Strait; three dead specimens from 45 fathoms east of Broken Bay. Contrary to Iredale's remark in his description of *denudatus immunitus* Iredale (Rec. Aust. Mus., 19, 1936, p. 324, pl. 23, f. 14), that this sub-species from deep water shows "the single inter-variceal nodule of the shore shells", these three specimens all show the double inter-variceal nodules of the true *denudatus* Perry. On the other hand there is in the author's collection a specimen with single nodules only from 40 fathoms off Wollongong, but more fringed than most shore dwelling forms, whilst other specimens from Balmoral, Port Jackson, show in some cases very little frilling and have single and double nodules alternately, so that *immunitus* Iredale must be regarded as a synonym.

*EUPHYLLON* Jousseume 1880, Le Naturaliste, 1, No. 42, p. 335, type species by original designation *monodon* Sowerby.

*cervicornis* Lamarck 1822, Hist. Anim. s. Vert., p. 163.

One live specimen off Cape Moreton.

*POIRIERIA* Jousseume 1880, Le Naturaliste, 1, No. 42, p. 335, type species by original designation *zelandicus* Quoy & Gaimard.

*Poirieria kurranulla*<sup>o</sup> sp. nov.

(Pl. 2, fig. 4.)

*Remarks:* This species, so far as known, has only been found in a fairly confined area. The author has a number trawled in 40 fathoms east of Caloundra, Q., and the within described specimen, the only one received from m.v. "Challenge", was marked as "off Cape Moreton", which is within a few miles of the same locality. Appears to be a fairly close relative of *Poirieria zelandicus* Quoy & Gaimard, from New Zealand waters.

*Description:* Shell of medium size, spire acuminate, sutures impressed; two whorled bulbous protoconch with somewhat oblique nucleus, terminating in a small varix; main whorls five; canal long, curved, and nearly closed; aperture oval, columella sinuate with callused and reflected inner lip, outer lip smooth with small anal groove; sculpture of irregular spiral lirae both above and below the fairly well defined shoulder on each whorl, crossed by irregular growth lines, persisting along full length of canal; two rows of long fairly straight spines produced from each varix and encircle body whorl, upper row being longer, and continuing in centre of smaller whorls, a rather obsolescent nodular formation occurs between the spines; three short curved spines occur on anterior canal; colour uniform pale fawn, inner and outer lip white, interior of aperture light pinkish purple; shell covered in young stages with furry greyish-fawn periostracum, which tends to disappear in mature shell; operculum oval, reddish-brown, with well defined overlapping growth lines and terminal nucleus.

<sup>o</sup>An aboriginal word meaning "a small pink sea shell".

*Dimensions:* Holotype, length 42 mm., breadth 13 mm., length of aperture 8 mm., canal 20 mm., longest spine 18 mm.

*Type Locality:* Trawled off Cape Moreton, Q., exact depth unknown.

*Type:* Holotype registered at National Museum of Victoria, Melbourne, No. F. 21118; several paratypes from 40 fathoms east of Caloundra presented to Australian Museum, Sydney, and National Museum of Victoria, Melbourne.

#### FAMILY TROPHONIDAE

*EMOZAMIA* Iredale 1929, Rec. Aust. Mus., 17, p. 185, type species by original designation *licina* Hedley & Petterd.

*licina* Hedley & Petterd 1906, Rec. Aust. Mus., 6, p. 219, pl. 37, f. 6.

Several large live specimens from 35-50 fathoms off Botany Bay, Port Kembla, Bermagui and Twofold Bay.

*XENOTROPHON* Iredale 1929, Rec. Aust. Mus., 17, p. 184, type species by original designation *euschema* Iredale.

*euschema* Iredale 1929, Rec. Aust. Mus., 17, p. 184, pl. 40, f. 3.

One dead specimen in 60 fathoms east of Broken Bay; one dead specimen in 50 fathoms east of Botany Bay; two dead specimens in 60 fathoms east of Port Kembla.

#### FAMILY CORALLIOPHILIDAE

*TOLEMA* Iredale 1929, Rec. Aust. Mus., 17, p. 186, type species by original designation "*sertata* Hedley" = *australis* Laseron 1955.

*australis* Laseron 1955, Proc. Roy. Zool. Soc. N.S.W., 1953-54, p. 72, figs. 1-2.

A fair number of well grown live specimens in 50 to 70 fathoms in many places along the coast from Newcastle to Twofold Bay; immature live specimens fairly numerous off Port Kembla.

#### FAMILY COMINELLIDAE

*BEDEVA* Iredale 1936, Rec. Aust. Mus., 19, p. 273, type species by original designation *hanleyi* Angas.

*hanleyi* Angas 1867, Proc. Zool. Soc. Lond., p. 110, pl. 13, f. 1.

Two dead specimens off Botany Bay; one dead specimen off Port Kembla.

#### FAMILY COLUMBARIIDAE

*COLUMBARIUM* Martens 1881, Conch. Mittheil., 2, p. 105, type species by monotypy *spinicinctum* Martens.

*hedleyi* Iredale 1936, Rec. Aust. Mus., 19, pp. 315-6, pl. 24, f. 18, 18a.

(= *trabeatum* Iredale 1936.)

Shells obtained in fair numbers from Newcastle-Broken Bay area in depths from 90 to 160 fathoms. The number of ridges below the periphery varies from one to five, and the peripheral flange shows teeth both increasing and decreasing in size. The shell is

variable and *trabeatum* Iredale (Rec. Aust. Mus. 19 (5), 1936, p. 316, pl. 23, f. 17) must now be regarded as a synonym. The operculum of this species, not formerly described, is corneous, pear shaped, chestnut brown in colour, vertically grooved, with a terminal nucleus.

#### FAMILY TEREBRIDAE

*ACUMINIA* Dall 1908, Nautilus, 21, pp. 124-5, type species by original designation *lanceata* Lamarck.

*lauretanae* Tenison-Woods 1878, Proc. Linn. Soc. N.S.W., 2, p. 262.  
One dead immature specimen in 70 fathoms east of Port Kembla.

*TRIPLOSTEPHANUS* Dall 1908, Nautilus, 21, pp. 124-5, type species by original designation *triseriatus* Gray.

*praelongus* Deshayes 1859, Proc. Zool. Soc. Lond., p. 135.

One dead specimen in 110-142 fathoms east of Newcastle; one dead specimen in 156-160 fathoms east of Newcastle; one dead specimen in 100-126 fathoms, 40 miles E.N.E. of Sydney.

#### FAMILY CONIDAE

*FLORACONUS* Iredale 1930, Mem. Q. Mus., 10, (1), p. 80, type species by original designation *anemone* Lamarck.

*angasi* Tryon 1884, Man. Conch., 6, p. 62, pl. 19, f. 99.

Two live specimens in 75 fathoms east of Stanwell Park.

*Floraconus wallangra*\* sp. nov.

(Pl. 1, fig. 3.)

*Remarks:* This species has presented some problems regarding its general shape and appearance, and more particularly as regards its very variable colour pattern. Also, a number of specimens received for study from as far north as Moreton Is., Q., are apparently all somewhat immature, but at the same time agree well in general shape and appearance with the one immature specimen received from m.v. "Challenge" from 75 fathoms east of Stanwell Park, together with two larger and mature shells.

*Description:* Shell medium size, light in weight, fairly straight sided, shoulders fairly sharply angled, aperture straight and linear, spire elevated and a little concave; protoconch two whorled and papillate, main whorls seven in number and concave; sculpture of rows of finely punctate lines at regular intervals on body whorl, tending to disappear with age, merging into oblique irregular ridges at anterior end; sculpture on spire of five or six fine but pronounced spiral lirae on each whorl, crossed by faint growth striae; colour medium brown on off-white ground, sometimes tinged with blue, in form of irregular blotches and maculations, tending to form two broad bands of brown round body whorl. In northern specimens these two bands tend to be more distinct than in southern specimens, whilst southern ones have revolving rows of irregular brown spots which tend

\*An aboriginal word meaning "big water".

to become indistinct or even disappear in specimens from the north; whole of spire flamed with same brown colouration; interior of aperture tinged with blue in varying degrees.

*Dimensions:* Holotype, length 34 mm., breadth 19 mm., length of aperture 29 mm.

*Type Locality:* Trawled in 75 fathoms east of Stanwell Park, N.S.W.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63323, with one immature paratype; one paratype presented to National Museum of Victoria, Melbourne, one paratype in author's collection.

*ENDEMOCONUS* Iredale 1931, Rec. Aust., Mus., 18, p. 225, type species by original designation *howelli* Iredale.

*howelli* Iredale 1929, Rec. Aust. Mus., 17, p. 182, pl. 40, figs. 1, 8.

One dead specimen off Moreton Is., one south of Cape Moreton; one dead specimen off Broken Bay; two mature live and two smaller dead specimens in 70 fathoms off Stanwell Park.

A further specimen taken alive off Stanwell Park and a little more than half grown, shows strong spiral lirae encircling entire body whorl, and close examination shows faint traces of spiral lirae in places on a number of other specimens examined, as mentioned in original description, this feature tending to diminish or disappear entirely as maturity is reached. Striated specimen also tends towards a coronated spire, very small nodules on anterior end of body whorl, and has a fine chestnut periostracum. Coloration of this species is most variable, from pale chestnut to dark brown in live specimens, paler specimens having also a paler periostracum; patterning can vary from all-over blotched appearance of brown on whitish ground, to two or three distinct brown bands of blotches with spotting between, whilst others have fine wavy longitudinal brown lines; spire also can vary from being highly elevated as in type, to almost flat in some specimens sent for study from northern N.S.W. coast; interior of shell suffused with pale pink fading to white at either extremity.

*RHIZOCONUS* Morch 1852, Cat. Conch. Yoldi., p. 68, type species by subsequent designation (Iredale 1930, Mem. Q. Mus., 10, p. 80) *miles* Linne.

*Rhizoconus advertex* sp. nov.

(Pl. 1, fig. 1.)

*Remarks:* Two specimens of this shell were obtained N.N.E. of Cape Byron, N.S.W., one off Moreton Is., Q., and a number of others later sent for study from deep water also from off Moreton Is. The species bears a resemblance in some ways to *Floraconus angasi* Tryon, but the consistent and distinctive colour pattern coupled with the fairly flat spire, broad, sharply angled shoulders and straight sides, leave no doubt as to its separate identity, in addition to which the localities where these two species have been found do not appear to overlap.

*Description:* Shell rather small but typical of the genus, sides fairly straight, shoulders sharply angled, mouth narrow, straight and linear, spire slightly elevated but with prominent protoconch; protoconch is papillate, smooth and translucent, of three whorls. and merges gradually into main whorls, which number six; main whorls slightly concave, with five or six well defined spiral striations crossed by fine growth lines; rows of very fine punctate spots faintly discernible on body whorl in most specimens, merging into well defined oblique ridges at anterior end, spaces between these ridges also having a punctate appearance; coloration of a whitish background, in some cases suffused with pink in varying degrees, with revolving rows of square or elongated spots; outstanding feature of colour pattern consists of two narrow bands of pinkish-brown over-riding two bands of large irregular dark brown blotches; spire flamed with reddish brown, interior white, sometimes suffused with pink.

*Dimensions:* Length of type 30 mm., breadth 19 mm.

*Type Locality:* Trawled in 80 fathoms off Moreton Is., Q.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63348, with one paratype; a further two paratypes held by National Museum of Victoria, Melbourne.

*LEPTOCONUS* Swainson 1840, Treat. Malac., p. 312, type species by subsequent designation (Herrmannsen 1847, Ind. Gen. Malac., 1, p. 584). *amadis* Martini (= *amadis* Gmelin).

*Leptoconus illawarra*<sup>o</sup> sp. nov.

(Pl. 1, fig. 2.)

*Remarks:* This species bears a fairly close resemblance to *Leptoconus eximius* Reeve from the Moluccas, the main difference being in the sculpture of the body whorl. Both shells are encircled by finely punctate lines, but whilst intervening spaces in this new species are quite flat and lines are only present from centre of body whorl to anterior end, intervening spaces in *eximius* Reeve consist of strong ridges and extend over whole of body whorl. Markings on this new species are also lighter and more orange in colour compared with the deep reddish-orange of *eximius*.

*Description:* Shell typical of the genus, conic, fairly straight sided, straight linear mouth, spire well elevated and concave; papillate protoconch of three whorls, smooth and translucent, and merges imperceptibly into body whorls, which number six; sculpture on spire usually of three fairly prominent spiral lirae on each whorl, crossed by well defined growth lines; anterior end of body whorl encircled by regularly spaced finely punctate lines, intervening spaces being flat at first but becoming more ridged and whole of this sculpture more oblique towards anterior end; coloration of encircling bands of orange-brown spots and blotches on off-white ground; spire similarly blotched, interior of aperture pinkish-orange, anterior end of columella white.

<sup>o</sup>An aboriginal word meaning "a pleasant place".

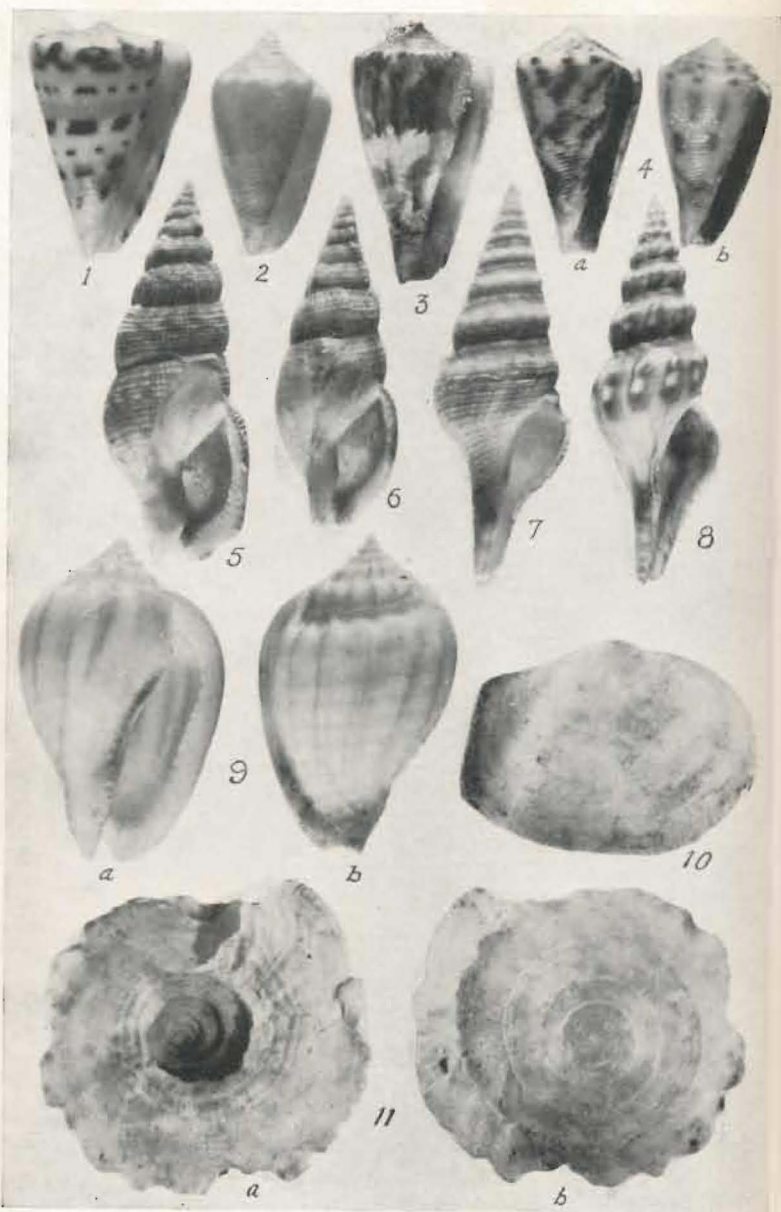


PLATE 1.

Fig. 1: *Rhizoconus advertex* Garrard. Holotype. Aust. Mus. C. 63348. Mag. XI.

Fig. 2: *Leptoconus illawarra* Garrard. Holotype. Aust. Mus. C. 63349. Mag. XI.

*Dimensions:* Holotype, length 29 mm., breadth 15 mm., length of aperture 22 mm.

*Type Locality:* Trawled in 75 fathoms east of Stanwell Park, N.S.W.

*Types:* Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63349 with three paratypes; three paratypes presented to National Museum of Victoria, Melbourne; three paratypes in author's collection.

*MAMICONUS* Cotton & Godfrey 1932, South Aust. Nat., 13, p. 69, type species by monotypy *superstes* Hedley.

*Mamiconus minnamurra*<sup>a</sup> sp. nov.

(Pl. 1, figs. 4a, b.)

*Remarks:* This species could conceivably grow larger than the holotype, there being no indication to show whether or not the shell is near maturity, and unfortunately, the lip of the holotype is broken. However it adds a most interesting species to this genus, formerly represented by the type species only.

*Description:* Shell typically conic in general appearance, spire slightly elevated, of six concave whorls and pronounced papillate protoconch of 1½ whorls; spiral whorls finely spirally striate, crossed by fairly prominent growth lines, with well defined shoulder present above each suture; sides of shell slightly concave towards anterior end; sculpture on body whorl of strongly defined spiral lirae, the whole crossed by very fine vertical lines; fine pale brown periostracum present; colour off-white with three irregular bands of brown blotches encircling body whorl; a row of brown spots just below shoulder, continuing between shoulder and suture on each whorl of spire; interior of shell has slight bluish tinge and protoconch translucent white.

*Dimensions:* Holotype, length 26 mm., breadth 14.5 mm., length of aperture 21 mm.

*Type Locality:* Trawled in 60 fathoms east of Botany Bay, N.S.W.

*Types:* Description based on holotype and one paratype, both presented to Australian Museum, Sydney, where they are registered No. C. 63350.

#### FAMILY TURRIDAE

*TURRIS* Muller 1766, Delic. Nat. Selectae, 1, p. 129, type species by original designation *Murex babylonius* Linne.

*Turris bindat* sp. nov.

(Pl. 1, fig. 7.)

*Remarks:* Only one specimen is so far known of this species, which appears to be by far the largest ever taken on the New South Wales coast, and a remarkable find in water so far south, the genus generally being considered strictly tropical.

<sup>a</sup>An aboriginal word meaning "plenty of fish".

†An aboriginal word meaning "deep water".

*Description:* Shell large, heavily built, with tall slender spire, eleven main whorls, apical whorls missing; outer lip, although damaged, appears to have been sharp, without any folding or thickening, and sinus on peripheral keel; fourteen well defined raised revolving threads visible within aperture; anterior canal fairly long and straight, small portion missing; whorls sharply angled at periphery, with a broad concave shoulder and well rounded base; sculpture consists of numerous well defined revolving lirae, interspersed with finer threads, crossed by oblique growth lines veering to right above periphery and to left below it, where sculpture has a general granulated appearance; one well defined thread prominent just below suture, two other fairly smooth prominent threads form the peripheral keel, whilst sculpture generally tends to become smoother towards anterior end of shell; colour consists of chestnut spots on prominent thread below suture and on periphery, with more general blotching on lower part of main whorl; background and interior of aperture white.

*Dimensions:* Holotype, length 77 mm., breadth 25 mm., length of aperture 34 mm.

*Type Locality:* Trawled in 75 fathoms off Broken Bay, N.S.W.

*Type:* Holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63351.

*TURRICULA* Schumacher 1817, Essai nouv. syst. Vers. test., p. 217, type species by original designation *flammea* Schumacher 1817.

*Turricula murrawolga*<sup>o</sup> sp. nov.

(Pl. 1, fig. 8.)

*Remarks:* Like the preceding species, this is another find of a genus normally regarded as only inhabiting tropical waters, and is once again indicative of the large field for further research which probably exists in the somewhat deeper waters of our coast. The species is strongly reminiscent of *Turricula kaderleyi* Lischke from Japan in general appearance.

*Description:* Shell fairly large, comparatively thin, regularly fusiform with long slender spire, main whorls eight in number; protoconch of two whorls, transparent, merging imperceptibly into first main whorl; canal long, straight and open, aperture approximately half total length of shell; outer lip thin and probably rounded, but damaged in all four specimens obtained; sculpture of slight evenly spaced revolving threads, crossed by faint growth lines which become a little more prominent on body whorl; posterior sinus just below suture, growth lines veering to right above it and to left below; one row of prominent elongated nodules present, evenly spaced round periphery of each whorl; colour white flamed with dark chestnut, a white patch present in centre and on top of each nodule, and a white band encircles body whorl midway between nodules and anterior end of shell; interior of aperture follows general colouration.

*Dimensions:* Holotype, length 57 mm., breadth 19 mm., length of aperture 28 mm.

*Type Locality:* All specimens trawled in 75 fathoms east of Broken Bay, N.S.W.

<sup>o</sup>An aboriginal word meaning "sheet of deep water".



*Types:* Owing to missing apical whorls on largest of four specimens obtained and damage to outer lip in all specimens, description based on series as a whole, of which holotype and one paratype presented to Australian Museum, Sydney, where they are registered No. C. 63352; one paratype presented to National Museum of Victoria, Melbourne; one paratype in author's collection.

**AUSTROTURRIS** Laseron 1954, Rev. N.S.W. Turridae, p. 6, type species by original designation *steira* Hedley.

*steira* Hedley 1922, Rec. Aust. Mus., 13, p. 224, pl. 42, f. 11.

One dead specimen in 45 fathoms east of Broken Bay.

**MICANTAPEX** Iredale 1936, Rec. Aust. Mus., 19, p. 319, type species by original designation *agnata* Hedley & Petterd.

*agnata* Hedley & Petterd 1906, Rec. Aust. Mus., 6, p. 220, pl. 37, f. 3.

Four dead specimens in 45 fathoms east of Broken Bay; one dead specimen east of Port Kembla.

*profundis* Laseron 1954, Rev. N.S.W. Turridae, p. 8, pl. 1, f. 13.

Two dead specimens east of Broken Bay.

**EPIDIRONA** Iredale 1931, Rec. Aust. Mus., 18, p. 225, type species by original designation *hedleyi* Iredale.

*hedleyi* Iredale 1931, Rec. Aust. Mus., 18, p. 225. New name for *Epideira striata* Hedley 1922 (not *E. striata* Gray 1827), Rec. Aust. Mus., 13, p. 230, pl. 43, figs. 18-20.

One dead specimen east of Broken Bay.

**BENTHOFASCIS** Iredale 1936, Rec. Aust. Mus., 19, p. 319, type species by original designation *biconica* Hedley.

*biconica* Hedley 1903, Mem. Aust. Mus., 4, p. 385, f. 98.

One dead specimen in 45 fathoms east of Broken Bay.

**VEXITOMINA** Powell 1942, Bull. Auck. Inst. Mus., 2, p. 77, type species by original designation *metcalfei* Angas.

*coxi* Angas 1867, Proc. Zool. Soc. Lond., 1867, p. 113, pl. 13, f. 15.

One live specimen in 45 fathoms off Broken Bay.

*suavis* Smith 1888, Ann. Mag. Nat. Hist., (6), 2, p. 305.

Two dead specimens off Botany Bay.

**FILODRILLIA** Hedley 1922, Rec. Aust. Mus., 13, p. 220, type species by original designation *tricarinata* Tenison-Woods.

*tricarinata* Tenison-Woods 1878, Proc. Linn. Soc. N.S.W., 2, p. 265.

Three dead specimens in 45 fathoms off Broken Bay.

**AUSTROCARINA** Laseron 1954, Rev. N.S.W. Turridae, p. 21, type species by original designation *recta* Hedley.

*recta* Hedley 1903, Mem. Aust. Mus., 4, p. 386, f. 99.

Two immature specimens in 45 fathoms off Broken Bay.

*ETREMA* Hedley 1918, J. Roy. Soc. N.S.W., 51, Suppl., p. M79, type species by original designation *aliciae* Melvill & Standen.

*denseplicata tasmanis* Laceron 1954, Rev. N.S.W. Turridae, p. 27, pl. 6, figs. 122-124.

One dead specimen off Botany Bay.

*ASPERDAPHNE* Hedley 1922, Rec. Aust. Mus., 13, p. 338. (New name for *Scabrella* Hedley 1918, not *Scabrella* Sacco 1890.) Type species by original designation *versivestita* Hedley.

*hayesiana* Angas 1871, Proc. Zool. Soc. Lond., 1871, p. 17, pl. 1, f. 17.

One dead specimen off Broken Bay.

*VEPRECULA* Melvill 1917, Proc. Malac. Soc., 12, pp. 141, 188, type species by original designation *sykesii* Melvill & Standen.

*vepratca* Hedley 1903, Mem. Aust. Mus., 4, p. 384, f. 97.

One dead specimen in 45 fathoms off Broken Bay.

## SUBCLASS OPISTHOBRANCHIA

### FAMILY SCAPHANDRIDAE

*ADAMNESTIA* Iredale 1936, Rec. Aus. Mus., 19, p. 333, type species by original designation *peroniana* Iredale (= *regularis* Gould).

*thetidis* Hedley 1903, Mem. Aust. Mus., 4, p. 395, f. 111.

Six live specimens off Botany Bay.

### FAMILY ARMINIDAE

*ARMINA* Rafinesque 1814, Precis decouv. trav. Somiol, p. 30, type species by subsequent designation (Iredale and O'Donoghue 1923, Proc. Malac. Soc., 15, p. 217) *tigrina* Rafinesque (= *Pleurophyllidia* Meckel, 1823, Archiv. Anat. Phys., 8, p. 190, type species by monotypy *lineata*).

*cygnea* Bergh 1876, Malak. Blatt., 23, p. 9, pl. 1, figs. 1-7.

One live specimen in 50-60 fathoms east of Newcastle.

### FAMILY PHILINIDAE

*PHILINE* Ascanius 1772, K. Vet. Acad. Handl. (Stockh.), 33, p. 331, type species by monotypy *aperta* Linne.

*angasi* Crosse & Fischer 1865, J. de Conch., 13, p. 38, pl. 2, f. 8.

One live specimen in 32 fathoms east of Terrigal.

## CLASS SCAPHOPODA

### FAMILY DENTALIIDAE

*DENTALIUM* Linne 1758, Syst. Nat. ed. 10, p. 758, type species by subsequent designation (Montfort 1810, Conch. Syst., 2, p. 55) *elephantinum* Linne.

S.g. *EPISIPHON* Pilsbry & Sharp 1897, Man. Conch. (Tryon), 17, pp. 31, 117, type species by subsequent designation (Suter 1913, Man. New Zeal. Moll., p. 821) *sowerbyi* Guilding.

*virgula* Hedley 1903, Mem. Aust. Mus., 4, p. 328, f. 2.

Numerous specimens obtained, some alive, in 74-75 fathoms east of Botany Bay.

## CLASS CEPHALOPODA

### SUBCLASS DIBRANCHIA (= COLEOIDEA)

#### FAMILY SEPIIDAE

##### SUBFAMILY SOLITOSEPIINAE

*DECORISEPIA* Iredale 1926, Aust. Zool., 4, p. 193, type species by original designation *rex* Iredale.

*rex* Iredale 1926, Aust. Zool., 4, p. 193, pl. 22, f. 9-10.

Two live specimens in 76-80 fathoms east of Lake Macquarie.

*GLYPTOSEPIA* Iredale 1926, Aust. Zool., 4, p. 191, type species by original designation *opipara* Iredale.

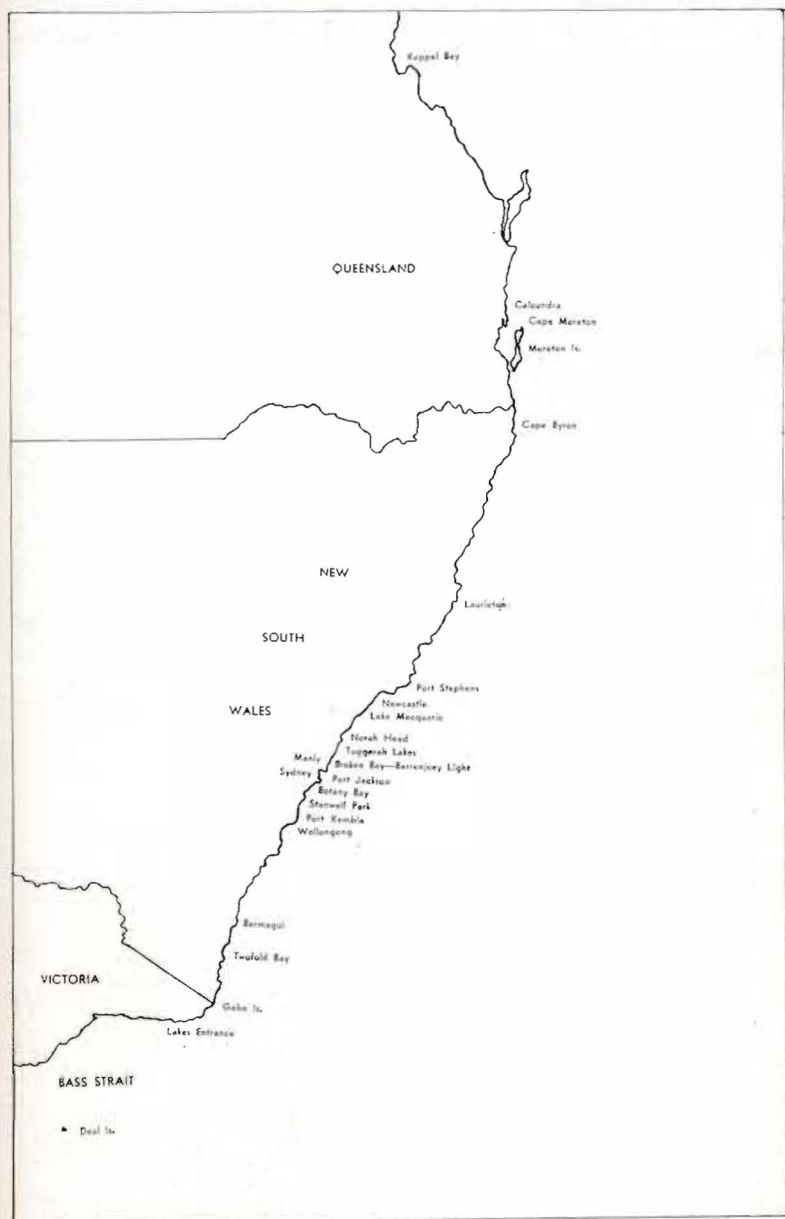
*cultrata* Hoyle 1885, Ann. Mag. Nat. Hist., (5), 16, p. 198.

Two live specimens in 156-160 fathoms east of Newcastle.

*ARCTOSEPIA* Iredale 1926, Aust. Zool., 4, p. 193, type species by original designation *limata* Iredale.

*versuta* Iredale 1926, Aust. Zool., 4, p. 193, pl. 23, f. 5-6.

Twelve live specimens in 76-80 fathoms east of Lake Macquarie; one live specimen in 96 fathoms east of Tuggerah Lakes.



## COMPARATIVE TABLE OF CHARACTERS

Genus <i>Liolophura</i> . Species:	<i>japonica</i>	<i>japonica</i> , form <i>tenuispinosa</i> *	<i>gaimardi</i>	<i>gaimardi</i> , form <i>platispinosa</i> *	<i>hirtosa</i>
Insertion Plates	8, 10, 11, 12-1-0	11-1-0	8, 10, 11-1-0	8, 10-1-1 or several	10-1-10
Callus VIII	Smooth, no fissure.  Sometimes one slight and narrow lateral projection  Lateral region little pectinated.	Very faintly cross-hatched  One (or two) lateral fissures, rather deep on each side  Pectinated	Smooth, no fissure  Sometimes one slight and narrow lateral projection  Not pectinated	No callus in the strict sense  Two spec., each with two deep fissures on each side. One spec., with 7 short lamellae superficial, sometimes none in the intermedi- ate region  Teeth well pectinated	Smooth, flat sometimes lightly cross-hatched  One spec., with one in- clined lamella and one curved lateral notch. One spec., with inclined and oblique lamellae.  Little pectinated
Sculpture	Rather smooth, somewhat granular.	Rather smooth, somewhat granular	Delicate granules, irregularly elong- ated in radial rows	Irregular granules	Irregular granules rather thick, elongated in radial rows
Zones of Growth: Lateral Area	More or less connected and close together.	Rather large and thick	Large, rather thick	Large	Large and thick
Jugum and Median Area	More or less smooth	Large and flat	Narrow	Narrow	More or less large, flat
Girdle, upper surface, large spines	Of equal length. More or less thick Cylindrical or flattened.	Of equal length. Slender, cylind- rical	Of different lengths, more or less cylindrical	Of different lengths, much enlarged	Of equal length, large and short
Dimensions in mm.	35 x 21: Lischke 36 x 25 } Taki 68 x 43 } 22.5 x 16 } Leloup 32 x 19 }	65 x 48 70 x 47 } Leloup 74.5 x 47 }	45 x 25: Iredale & Hull 23.5 x 16 } Leloup 35 x 27.5 }	18.5 x 13 21 x 11 30 x 18.5 } Leloup	65 x 35: Hull, max. 46 x 28.5 } Leloup 52 x 30 40 x 29 }
Origin	Japan and vicinity	Indo-China and vicinity	Australia to the Malayan Archi- pelago, Atlantic coast of Africa.	Shikok (Japan) Tonkin	From South-West Aus- tralia to the Abrolhos and Dirk Hartog Islands

\* See E. Leloup, 1939, Bull. Mus. roy. Hist. Nat. Belg., 15, 1.