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# AUSTRALIAN MOLLUSCAN NOTES.

No. 2.

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(Plates xx—xxiv.)

MANY of the shells described in "Australian Molluscan Notes, No. 1\*" were derived from dredgings dumped at Dundas, on the Parramatta River. Owing to the depression, the operations of the dredge "Triton" have been suspended for the past three years, and, for the same reason, the trawling fleet, another prolific source of interesting material, has not been working continuously. Nevertheless, consideration of the forms obtained from the Dundas dump, and the results of a few successful finds, necessitate a number of notes, and a large number of records has accrued.

I again have to thank Miss J. Allan and Mr. G. C. Clutton, whose drawings and photographs make the species very easy to distinguish when specimens are compared.

## *Cucullaea vaga* Iredale.

(Plate xx, fig. 1.)

Mr. W. L. Dingeldei has been collecting specimens obtained from Captain K. Moller, and anything strange he has brought in to the Museum. Through his efforts most of the trawled novelties have been secured. A nice valve of *C. vaga* is here figured, procured off Shoalhaven Bight in about forty-five fathoms, a southernmost record, the species having been described from off Norah Head, north of Sydney. This specimen shows the deeper shell and the coarser sculpture well, the latter even showing obsolescence. Mr. Bernhard, of Rockhampton, has sent specimens from Keppel Bay, indicating that the northern and southern species overlap about that locality. One shell agrees with the figure here given, but the other is larger, more elongate, the ventral margin swollen medially, and the sculpture consists of many fine radials closely packed and almost beaded laterally through the numerous concentric lines that usually only slightly cut the radials.

## Family ARCIDAE.

I have reviewed the Queensland members of this family in a report on the Mollusca of Low Isles, to be published later, but will here comment on the New South Wales species, which had to be studied simultaneously. A well-known northern species straggles as far south as New South Wales, but is not included in Hedley's local catalogue. It was listed in the Queensland fauna as *Arca foliata* Forskal, and G. P. Whitley and I made a good collection of valves from the beach at Caloundra in order to study the variation. I found that two species had been confused. One was pure white with coarse sculpture on the posterior angulate portion, and the other had that area finely sculptured and coloured red-brown, the former being the *foliata* and the latter the *fasciata* of Hedley's list. Later it was found that the white shell of the coral reefs, also called *foliata*, was different from both, and the problems involved have been worked out in the paper above cited.

A few complete specimens of *Arca metella* Hedley have been secured on the Continental Shelf, and these prove to belong to no known group. They show the right valve to be the smaller and clasped by the left, and a well-marked median

\* For No. 1, see Records of the Australian Museum, Vol. xviii, No. 4, 1931, p. 201.

depression appears on both valves, less noticeable on the right. The ligamental area is long and broad, and naked, save behind the umbones, where a narrow triangular line runs backwards. This being apparently a deepwater relation of the series known as *Acar*, the differences need recognition, and the new generic name *Destacar* is assigned to it. The species, *A. strabo* Hedley, which also occurs on the Continental Shelf, is very different, having sculpture and form allying it to the fossil *cainozoica* and somewhat similar hinge teeth. These are long and slanting, and recall those of *Cucullaea*, but the shell differs entirely from that genus, as shown by Hedley's excellent figures. It is here made the type of the new genus *Samacar*, the deep concentric grooving forming a distinctive feature. The ligamental area is very narrow, and seems to be almost completely naked in the one living specimen available, agreeing in that with the many single valves examined.

#### Family PINNIDAE.

Hedley<sup>1</sup> revised this family, and from this account the local species would read *Pinna isosceles* Hedley, *Pinna menkei* Reeve with var. *caviterga* Hedley, *Atrina strangei* Reeve and *A. tasmanica* Tenison-Woods. Winckworth<sup>2</sup> has reviewed Indian species, and, through an unaccountable lapse, has overlooked Hedley's paper, and has amassed for some species a long synonymy which is not upheld by a study of Australian series. The Queensland and Western Australian forms will be dealt with elsewhere. Winckworth suggests *menkei* as a synonym of *atropurpurea* Sowerby, a species shortly described from unknown locality and not figured. The whereabouts of the type (sold by auction) are unknown to me, but if Hanley<sup>3</sup> figured it, then the Australian so-called *atropurpurea* of Hedley is different, as is the local *menkei*. Winckworth suggested as doubtfully synonymous, *madida* Reeve, but that Australian species is quite distinct. A good photograph of the local *menkei* has just been published in the "Australian Museum Magazine,"<sup>4</sup> and there is little variation seen in this species. Hedley<sup>5</sup> introduced as a new species, *Pinna isosceles*, intending the name to take the place of *muricata* as locally used, but unfortunately for his type he selected a small specimen which proves to be only a stunted abnormality of *P. menkei* Reeve. Thus his name falls as a synonym, and there is no record of the "*muricata*" style of shell from New South Wales, and it is very unlikely that there will be, if the conclusion that it is purely a coral-living species be correct.

On the other hand, the specimen which Hedley referred to as *strangei* approaching *hystrix* from Ballina, is apparently a juvenile of the *vexillum* series, and this addition may take the place of "*isosceles*." Dingeldei picked out of the harbour dredgings a very small *Pinna*, which appears to be the young of one of the *assimilis* series, and there is an old specimen of that group in the Museum, but the only locality given is "New South Wales."

#### Family OSTREIDAE.

Since writing<sup>6</sup> about the members of this family a complete revision of eastern Australian forms has been made, but as publication is deferred, the New South Wales forms may be here mentioned.

<sup>1</sup> Hedley.—Rec. Austr. Mus., xiv, 1924, pp. 141-153.

<sup>2</sup> Winckworth.—Proc. Mal. Soc. (Lond.), xviii, 1920, pp. 276-297.

<sup>3</sup> Hanley.—Recent Bivalve Shells, 1886, p. 255, Suppl., pl. 24, fig. 36.

<sup>4</sup> Allan.—Austr. Mus. Mag., v, 1934, fig. on p. 222.

<sup>5</sup> Hedley.—Rec. Austr. Mus., xiv, 1924, p. 145, pl. xix, fig. 1.

<sup>6</sup> Iredale.—Proc. Linn. Soc. N.S.W., xlix, 24 Oct., 1924, pp. 191-2.

*O. virescens*, which was left in doubt, is a very distinct little species quite common and characteristic. The Sydney name, *O. angasi*, may be resumed for the local (apparently extinct) shell.

Another apparently extinct species is *Lopha hyotis* Linné, of which huge tropical species Captain Comtesse picked out from the "Triton" dredgings a very old but characteristic upper valve. This is much smaller than the existing shells collected in Queensland, and may represent a sub-species, *L.h. notina* nov. (Plate xx, fig. 2).

The Rock Oysters are very distinct in every essential feature so that *Saxostrea* is proposed for *Ostrea commercialis* Iredale and Roughley.<sup>7</sup> This genus may be diagnosed as follows: Small to medium-sized oysters, the lower valve deep and sometimes cup-shaped, the upper valve flattened; adherent to rocks by the greater part of the lower valve; generally deeply colored, bluish to black; the hinge line short, the hinge plate medium, the internal edges of valves more or less crenulated. The juvenile is rounded and flattened, sometimes spinose, but the spines disappear with age, and commonly a radially crumpled sculpture is seen in the adult. As regards its life history, full details of which are given in the article by Roughley cited, the animal is dioecious, the egg small, the adult non-larviparous.

#### *Decatopecten strangei* Reeve.

(Plate xx, fig. 3.)

Among Queensland and Western Australian Scallops many groups were observed which differ greatly from the southern series distinguished recently.<sup>8</sup> These will be fully treated in another place, but Mr. H. S. Mort brought in a valve from the Dundas dump similar to one he had found at Low Isles. The valve appears to be referable to *Pecten strangei* Reeve,<sup>9</sup> and is here figured.

The generic name *Decatopecten* was introduced by Sowerby,<sup>10</sup> ex Rüppell, and later by Swainson<sup>11</sup> as *Decadopecten*, also referred to Rüppell, but so far no publication of the name by Rüppell has been found. In each case the type was *Ostrea plica* Linné. It may be noted that Gray<sup>12</sup> in 1847 quoted the generic name as "*Dentipecten* Rüppell 183-?."

#### *Dimyarina* gen. nov.

Type.—*Dimya corrugata* Hedley.

When Hedley<sup>13</sup> introduced this shell as a species of the fossil genus *Dimya* he was dependent on odd dead valves. It has since been found frequently on the Continental Shelf in the living state, and the shell is often found practically free. It is a shining white with a silvery sheen, and differs decidedly from the fossil type, the hinge and general appearance suggesting a close relationship with *Plicatula*. Hedley's description is good and sufficient.

#### *Monia deliciosa*, sp. nov.

(Plate xx, figs. 7, 7a.)

Not uncommon in deep water, this species may be shortly described, as there is not much that cannot be seen in the figure.

<sup>7</sup> Iredale and Roughley.—Proc. Linn. Soc. N.S.W., lviii, 15 Sept., 1933, p. 273; Roughley, tom. cit., p. 279.

<sup>8</sup> Iredale.—Rec. Austr. Mus., xvii, 1929, p. 162.

<sup>9</sup> Reeve.—Conch. Icon., viii, pl. iv, sp. and f. 22, 1852: Moreton Bay.

<sup>10</sup> Sowerby.—Conch. Man., 1st ed., 1839, p. 37.

<sup>11</sup> Swainson.—Treat. Malac., 1840, p. 388.

<sup>12</sup> Gray.—Proc. Zool. Soc. (Lond.), 1847, p. 200.

<sup>13</sup> Hedley.—Austr. Mem., iv, p. 309, 29 July, 1902, fig. 52 in text.

Shell subcircular, thin, depressed, white, showing fine concentric growth lines only. Interior white, muscle scar slightly greenish.

Dimensions of type: Height, 30 mm.; breadth, 29 mm.; depth of conjoined valves, 5 mm. Along the Continental Shelf of New South Wales. Type from about 75 fathoms off Cape Everard, Bass Strait.

The shore forms in this group are difficult to determine by means of shell characters and muscle scars, though Winckworth has shown that the British species can be separated by means of the gill formation.

The common species of "*Anomia*" is listed as *walteri* Hector, a name given to a New Zealand shell to which the local shell bears a strong resemblance. In the juvenile, and typically, the muscle scars are three, one semicircular, the diameter away from the hinge, and, below, two similarly shaped ones separated by a narrow line. As the shell develops the lower pair appear to grow more apart obliquely until they recall the muscle scars of *Patro*, that is there are three separate-muscle scars, the uppermost semicircular, the other two circular, the lowest the largest. In coloration the shades vary from pale greenish white, through yellow and orange, to a deep bronze red. The sculpture is normally low wavy ridges, and the shape subcircular, the breadth more than the length. Conditions of living alter the proportions and sculpture greatly, the latter commonly showing nodulation. In all the Neozelanic specimens available the two lower muscle scars are attingent, a state never seen in the common Sydney shell, so that by this criterion the Sydney shell is a different species and is named *Anomia descripta* sp. nov. (Plate xx, fig. 6.) The lower valve is usually greenish, whatever the colour of the upper valve may be, always becoming darker as the upper valve becomes brighter, so that a bronze-red upper valve may reveal a dark-green to blue lower valve.

*Monia* can always be recognized by its muscle scars, only two in number, the upper one showing a striated appearance. The shell is always greenish, and has a surface sculpture of ridges, with fine prickles when in good condition.

#### Genus *Musculus*.

Some years ago I<sup>14</sup> determined *Musculus* Bolten as the generic name for the group commonly known as *Modiolaria*. This was challenged by Dall, who contended that Bolten's name was preoccupied by "*Musc.*" of Martyn, a somewhat curious argument. Unfortunately this view has been accepted by Grant and Gale<sup>15</sup>, so that it is fortunate that the rejection of Martyn's names obviates further argument. The three species on the New South Wales list resembling the Neozelanic type, *impacta* Herrmann, bear the names *cumingianus* Reeve, *cuneatus* Gould, and *varicosus* Gould. While the type locality of the first named is Moreton Bay, and of the last named Sydney, the type locality of *cuneatus* Gould is False Bay, Cape of Good Hope. The description of the African shell does not apply to the local shell, as it reads "sulcis quadratis punctatis, anticis 16, posticis 30." Bartsch gives 16 and 17, while our shell counts about 15, 20. As our species has been confounded with *cumingianus* the two are figured for comparison.

<sup>14</sup> Iredale.—Journ. Conch., xiv, 1915, p. 342.

<sup>15</sup> Grant and Gale.—Mem. San Diego Soc. Nat. Hist., i, Nov., 1931, p. 253.

**Musculus ulmus**, sp. nov.

(Plate xxi, fig. 10.)

Shell small, transversely oval, equivalve, very inequilateral, umbones anterior, dorsal and ventral margins subparallel, the latter very little rounded. The umbones are incurved, placed very anteriorly, the anterior side being almost perpendicular, the posterior side horizontal and then depressed in a curve to meet the ventral margin. An elevated rounded rib runs from the umbo to this posterior curve. The sculpture on the anterior area is rather coarse, fifteen flattened ribs with narrow interstices, and a smooth wide area separates this sculptured area from the similarly, but more finely, ribbed posterior area, about twenty ribs being counted.

Length, 9 mm.; height, 6 mm. Type from Sydney Harbour. Habitat—New South Wales.

Genus **Quendreda** nov.Type—*Dacrydium fabale* Hedley.

The species Hedley<sup>16</sup> ascribed to *Dacrydium* differs in shape, form, and sculpture from the Spitzbergen shell, the type of Torell's genus.

Genus **Eucrassatella**.

Accession of material enables adjustment in the genus *Eucrassatella* with recognition of more species than were recorded in a previous paper<sup>17</sup>.

While, in consideration of previous workers, the forms around the Australian coast were regarded as geographical representatives it is now found that two distinct groups occur together in Western Australia, the smooth and the sulcate, and that Lamarek's *donacina*, described as from Shark's Bay probably did come from that locality. At any rate a smooth shell comes from Dongera, close to Shark's Bay, which agrees fairly with Lamy's figure of the type, and differs decidedly from *sulcata* Lamarek=*pulchra* Reeve, also from that locality, in shape and hinge as well as sculpture.

Many valves collected at Friday Island, Torres Strait, by Mr. Melbourne Ward are all smaller, and have shorter beaks than the Moreton Bay *cumingii*, and are therefore called *E. cumingii wardiana* subsp. nov. The most interesting discovery, however, is a broken half of a valve collected by Captain Comtesse from the "Triton" dredgings. It represents indubitably a new species, being sulcate throughout, the sulci distant, very unlike those of *cumingii*, and more like the typical *pulchra* from West Australia. It is altogether unlike *kingicola*, which is found in southern New South Wales, and on account of its importance is here named *Eucrassatella genuina* sp. nov. Height, 60 mm.; breadth, 45 mm.; probable entire breadth, 80 mm. (Plate xx, fig. 4.)

The South Australian form of *kingicola* is undoubtedly more elongate than the typical one, with the umbones less plicate and may even be specifically separable. For the present it may be called *E. kingicola verconis* subsp. nov., the type from St. Vincent Gulf, South Australia, being 89 mm. long, 69 mm. high, and the conjoined valves 38 mm.

<sup>16</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxix, 1904, p. 199, pl. 10, fig. 39.

<sup>17</sup> Iredale.—Proc. Linn. Soc. N.S.W., xlix, 24 Oct., 1924, p. 202.

At Lord Howe Island there also lives a form very like the Moreton Bay *cumingii*, but the beak is more attenuated, somewhat sinuate on the ventral margin towards the posterior end; the sculpture also is finer, the sulcations are closer together and vanish ventrally. This may be called *E. cumingii baxteri* subsp. nov., the type measuring 64 mm. in length, 52 mm. in height, and the conjoined valves 30 mm.

#### Genera *Cuna* and *Condylocardia*.

The small bivalves classed under *Cuna* and *Condylocardia* are very confusing, and the so called genera present a heterogeneous aspect. The type of *Cuna* was *concentrica*, a small species with concentric sculpture, and closely allied forms do not occur in New South Wales. The nearest form is *Carditella delta* Tate and May, which has a similar form, but has radial sculpture, and the hinge teeth differ in detail. It is here named *Volupicuna*, and may be treated as a subgenus. Hedley's *C. particula* is very different, being oblique in shape, and with a different hinge, as pointed out by Hedley when he described it; the new genus *Saltocuna* is introduced for it. The species *Kellia atkinsoni* Tenison-Woods may be located here as it agrees fairly well. Hedley's *C. pisum* is so different that it was not recognised as a *Cuna* when first noted, being a much larger crass shell with a hinge of a different nature. It is here called *Cunanax*, gen. nov. Hedley has given excellent figures and descriptions of all these species.

The type of *Condylocardia* is *sanctipauli*, a species with radial sculpture, and *ovata* is quite dissimilar, having concentric sculpture and a different hinge formation. Similar to *ovata* are *trifoliata* and *projecta*, and these can be associated in the new genus *Condylocuna*, the species *projecta* being named as type. While *trifoliata* was described from Mast Head Reef, Capricorn Group, Hedley admitted it to the New South Wales list, and Verco included it in the South Australian fauna. Cotton has renamed Verco's *trifoliata*, *isosceles*, and Hedley's New South Wales shells must also be differentiated as *Condylocuna cambrica* nov. being broader, less strongly sculptured, with a protoconch proportionately larger and less notably trifoliolate, the type locality being Chinaman's Beach, Balmoral, Port Jackson. Hedley and May recorded *Condylocardia porrecta* Hedley, from 100 fathoms off Cape Pillar, South Tasmania, giving beautiful figures, and this is here renamed *Radiocondyla arizela* gen. et sp. nov., the typical *porrecta* from Mast Head Reef being larger, more convex, the ribs more triangular and separated, and the hinge more compact. The species *Carditella pectinata* Tate and May may also be placed under *Radiocondyla*, but it may later be separated.

#### Genus *Carditella*.

This genus was introduced by Smith for a small South American mollusc, and later, when he was working out the "Challenger" shells, he added to his genus some Australian shells, but pointed out that they differed essentially in hinge-features. Nevertheless the association has been continued by Australian workers without re-consideration. I now separate Smith's *Carditella angasi* under the new generic name *Carditellona*. Tate and May described a Tasmanian shell as *Carditella elegantula*, and it is included in the New South Wales list under the same name. It is certainly not even congeneric with *C. angasi*, and is therefore differentiated as a new genus, *Carditellopsis*. Smith observed that no portion of the ligament was internal in *C. angasi*, though this was one of the main supports of his genus *Carditella*. In *C. elegantula* the ligament is also external, and the surface sculpture

is not that of the *Carditella* series but somewhat recalls the group *Cunanax*, with which the local specimens have sometimes been confused; the lack of an external ligament in *Cunanax* makes them easily separable. The local *Carditelopsis* is apparently narrower than the typical form, but long series are not available.

***Epicodakia kennethi*, sp. nov.**

(Plate xx, fig. 10.)

Master Kenneth Blacket found on the Narrabeen beach two valves of a rather smooth oblique *Epicodakia*, very unlike any of the described forms. Shell small, convex, oblique, inequilateral, white. The sculpture consists of concentric fine ridges closely packed together, over-ridden at the sides only with a fine radial striation. The form can be seen from the figure, the apex being at about the anterior two-thirds, the teeth being small, the laterals set rather widely apart, and the muscle-scars Lucinid. The hinge is delicate, the impressed lunule of *Epicodakia* practically obsolete, the ligament groove being shallower and probably showing the ligament externally, so that a new subgenus *Talocodakia* is introduced.

Height, 20 mm.; breadth, 25 mm.; depth of single valve, 7 mm. Habitat—Narrabeen, north of Manly, New South Wales. The delicate sculpture, shape and teeth effectually distinguish this species from any other.

***Divalucina*, gen. nov.**

Type—*Lucina cumingii* A. Adams and Angas.

This attractive shell has been placed in *Divaricella*, proposed for a Mauritius species. A shell similar to the Mauritius one occurs in North Australia, but the southern shell, in addition to being larger, with much finer sculpture, has notable lateral teeth, of which there is no sign in the northern species. Moreover, the cardinals in the present species are two in number, one being large and bifid, while in the northern form there are only two small scarcely projecting teeth, a large semi-internal ligament doing most of the hinge work. Further, in the southern genus there is no deep pseudolunule as in the typical *Divaricella*.

Grant and Gale<sup>18</sup> have placed *Divaricella* in the family Ungulinidae on account of its missing laterals, but suggest that the family might be included in the Codakiidae. Mr. B. E. Bardwell has sent a specimen of *Divalucina* from Roebuck Bay, North-West Australia, which agrees quite well in every feature save that the sculpture is finer, sixty waves being counted as against forty in a typical shell of the same size. This apparently represents a distinct subspecies, which may be called *D. cumingii bardwelli* nov.

***Toralimysia*, gen. nov.**

Type—*T. excentrica* sp. nov.

Hedley<sup>19</sup> figured a Sydney shell under the name *Joannisiella sphaericula* Deshayes, but did not compare it with authentic specimens, and no shell was found under the name in the British Museum. The above name is therefore given to the shell Hedley figured, the new generic name being necessary as the type of *Joannisiella* proves, upon autoptic examination, to be different. The Queensland shell named by

<sup>18</sup> Grant and Gale.—Mem. San Diego Soc. Nat. Hist., i, Nov., 1931, p. 295.

<sup>19</sup>Hedley.—Proc. Linn. Soc. N.S.W., xxx, 1906, p. 544, pl. xxxii, figs. 18–21.



Melville and Standen<sup>20</sup> *Diplodonta ethima* appears to be the true *sphaericula* or a very slight variant. Hedley's figures above cited are excellent, and the local shell differs from the type of *Joannisiella* in form and appearance, and especially in lacking the excavate pseudo-escutcheon in which the external ligament is buried. Our shell clearly shows the ligament outside, and has the cardinal teeth more spaced and the lateral grooving obsolete.

### **Borniola filosa** Hedley.

(Plate xxi, fig. 2.)

Three species of *Borniola* occur in New South Wales, *filosa* Hedley from Middle Harbour, *lepida* Hedley from Manly beach, etc., and *radiata* Hedley from deep water, 111 fathoms off Cape Byron, New South Wales.

I introduced the generic name *Borniola*, naming *B. lepida* as type. The species described by Hedley as *Bornia filosa* occurred among the "Triton" dredgings as a very rare shell, and as it is pinched medially on the ventral surface commensalism with a crustacean by means of the byssus is suggested, it may be called *Byssobornia*. Hedley's description<sup>21</sup> is good, but unfortunately the figures of some other shell have been substituted for the correct ones, and so another figure is here given of a shell compared accurately with the previously unique type.

### Genera **Kellia** and **Lasaea**.

For the past forty years these two generic names have been in use for small bivalves, but now Grant and Gale<sup>22</sup> point out that the type of *Kellia* is the same as that of *Lasaea*, and thus *Kellia* will take the place of *Lasaea*. Two species of the latter have been sometimes recognised, as there generally appears to be two different shells around here, but it is not clear what names should be used. Tentatively, until a complete revision can be undertaken, we may admit *Kellia australis* Lamarck<sup>23</sup> and *Kellia scalaris* Philippi<sup>24</sup> without prejudice as to the value of the observed differences.

Four species were ascribed to *Kellya* by Hedley, *adamsi* Angas, *jacksoniana* Smith, *solida* Angas, and *suborbicularis* Montagu, the last named being given a universal distribution, which is scarcely justified under present-day views.

Grant and Gale used *Chironia* Deshayes<sup>25</sup> for the *suborbicularis* series, but there is a prior *Chironius*,<sup>26</sup> as well as a *Chirona*.<sup>27</sup>

As *solida* Angas is very doubtfully congeneric even with *adamsi* Angas, a new generic name *Marikellia* is here proposed, with *solida* as type, and *adamsi* and *jacksoniana* can be placed under it, while *suborbicularis* may be left under *Chironia* until re-investigation settles the various matters as to specific and generic identity.

The New South Wales shell determined as *suborbicularis* differs in detail, and has been recognised by E. A. Smith<sup>28</sup> as *Erycina rotunda* Deshayes,<sup>29</sup> and this specific name may be used in connection with *Marikellia* until these small bivalves are critically examined as to animal characters.

<sup>20</sup> Melville and Standen.—Journ. Linn. Soc. (Lond.), Zool., xxvii, 1899, p. 197, pl. ii, figs. 17–17a.

<sup>21</sup> Hedley.—Proc. Linn. Soc. N.S.W., 1902, p. 7 (not figures pl. ii, figs. 15–17).

<sup>22</sup> Grant and Gale.—Mem. San Diego Soc. Nat. Hist., i, 3 Nov., 1931, p. 301.

<sup>23</sup> Lamarck.—Hist. Anm. S. Vert., v, 1818, p. 560.

<sup>24</sup> Philippi.—Zeitschr. für Malak. (Menke), 1847, p. 72.

<sup>25</sup> Deshayes.—Rev. Zool. (Cuv.), ii, 1839, p. 357.

<sup>26</sup> Fitzinger.—Neue Classif. Rept., 1829, pp. 29, 60.

<sup>27</sup> Lyell.—Phil. Trans., cxxv, 1835, p. 87.

<sup>28</sup> Smith.—Proc. Mal. Soc. (Lond.), v, 1902, p. 163.

<sup>29</sup> Deshayes.—Proc. Zool. Soc. (Lond.), 1855, p. 181, 5 Jan., 1856: Moreton Bay.

**Ambuscintilla**, gen. nov.

(Plate xxi, fig. 4.)

Type.—*A. praemium* sp. nov.

When Whitley and I were searching the Bottle and Glass Rocks, Watson's Bay, recently, a bivalve was found hiding in the burrows made by the prawn, *Crangon*. It was superficially a Scintillid, and upon putting it into water the animal walked with its shell half open, and a long siphon outstretched in front, and one behind with smaller tentacles, quite unlike the animal of *Solecardia cryptozoica* Hedley,<sup>30</sup> though the shell was somewhat similar.

Shell very thin, delicate, translucent, broadly ovate, subequilateral. The muscle scars are connected, but a shallow pallial sinus is developed, and also a smaller muscle scar situated above the anterior adductor scar. The hinge shows a muscular ligament between the umbones and a small cardinal in each valve.

Breadth of largest valve, 9 mm.; height, 6.5 mm.

A similar animal was found in connection with a Scintillid shell at Low Isles, where three different animals were noted, the shells of which were the simple glassy forms associated together under the name *Scintilla*, and which gave little clue to their animal forms.

**Regozara**, gen. nov.Type.—*R. olivifer* sp. nov.

A genus of the Cardiidæ, large, elongate oval, convex, sculptured with strong radial ribs, valves tightly closed, no lunule or escutcheon; teeth strong.

This group of Cardiums is very characteristic, and has been called *Trachycardium*, but that name belongs to a superficially similar American group.

**Regozara olivifer**, sp. nov.

(Plate xx, fig. 8.)

Shell large, thick, elongate oval, very convex. Coloration pale cream to white, mottled and marked with red-brown, the blotches becoming confluent with age.

The sculpture consists of elevated conical ridges, twenty-eight in number, the median ones tall, erect, angulate, and crossed by nodules which tend to coalesce towards the ventral margin. At the sides the nodulation develops into spinose beading, the very narrow interstices showing only growth lines, which appear to link up with the sculpture of the ribs as the shell grows larger.

Internal coloration white, margins strongly angulately toothed. Hinge teeth thick, laterals rather distant, cardinals somewhat separated.

Length of type, 66 mm.; breadth, 56 mm.; depth, 46 mm.; much larger ones occur.

*Habitat*.—Northern New South Wales; type from Sydney Harbour.

This fine species is included in Hedley's list as *Cardium flavum* Linné, but Hanley concluded that Linné's species was indeterminable, and proposed the acceptance of Schröter's identification, a method not now adopted. In any case a local New South Wales shell would be quite unknown to Linné. Then the Lamarekian name *rugosum* has been employed, but he cited Schröter for a shell from the Indian Ocean described as "*immaculata albida*."

<sup>30</sup> Hedley.—Proc. Linn. Soc. N.S.W., xli, 1916 (1917), p. 684, pl. xlvii, fig. 1, pl. li, fig. 40.

The Queensland shells referred to *flavum*, *rugosum*, etc., are under review in another place, and nothing exactly like the present species has been found in North Queensland, though three or four similar species have been determined.

On the other hand the species recorded by Hedley as *Cardium cygnorum* Deshayes and *Cardium oxygonum* Sowerby are not referable to those species, the former West Australian shell not reaching New South Wales, while specimens of the true *oxygonum* from the Philippine Islands, though superficially resembling the local shell, have been found to differ appreciably in detail, and will be described later.

#### Genus **Gafrarium**.

Hedley<sup>31</sup> used *Gafrarium quoyi* Hanley for a common Sydney shell, rejecting *scripta* Linné, and giving reasons for acceptance of Hanley's name. Tomlin<sup>32</sup>, examining specimens in the British Museum, recorded synonyms of *scripta*, and cited *quoyi* as a synonym of *rivularis* Born, a different species.

Examination of Western Australian and Queensland shells referable to these series, which is here classed under *Circe*, indicated many local species, and furthermore caused the recognition of *sugillata* Reeve<sup>33</sup> as undoubtedly the well known local shell.

The Queensland shells and the Western Australian ones will be described later, while the very distinct South Australian shell has been described by Cotton.

#### **Redicirce**, gen. nov.

Type.—*R. mistura* nov.

A comparatively smooth species of the small *Circe*-like series was picked out of the Sydney Harbour dredgings, and upon comparison was found to be quite distinct from any of the recorded species.

Shell small, almost equilateral, rather trigonal in shape, a little convex, sculpture of fine concentric ridges and faint radials at sides. Hinge teeth much weaker than those of *Circe*, the hinge plate quite different and not very much like that of *Crista*, wherein Jukes-Browne has placed somewhat similar shells.

#### **Redicirce mistura**, sp. nov.

(Plate xxi fig. 3.)

Shell small, not very convex, somewhat triangular in shape, umbo almost median. Coloration whitish rayed with orange streaks, an underlying painting of angulate yellow lines being present. The rather shining, almost smooth surface shows a weak concentric ridging, with the distinctive curved radial ribbing almost suppressed and showing only at the edges of the shell towards the umbo. The small hinge plate differs entirely from that of a specimen of *Circe* of the same size and cannot be compared with that of *Crista*, from which genus the whole facies separates it, especially the small area enclosed by the pallial line, which is like that of *Circe*. Breadth, 20 mm. : height, 18 mm. : depth of single valve, 5 mm. Type from Sydney Harbour, New South Wales. Series from North-West Island, Capricorn group, Queensland.

<sup>31</sup> Hedley.—Proc. Linn. Soc. N.S.W., xli, 1916 (1917), p. 688.

<sup>32</sup> Tomlin.—Proc. Mal. Soc. (Lond.), xv, 1923, p. 311.

<sup>33</sup> Reeve.—Conch. Icon., xiv, Oct., 1863, pl. iii, fig. 11.

**Redicirce consola**, sp. nov.

(Plate xxi fig. 5.)

A small valve picked out of shells trawled in 45–55 fathoms off Newcastle, New South Wales, is here named as it apparently represents another tropical series.

Shell very small, stout, a little convex, less triangular than preceding and differing in its corrugated surface, the radial side lines more developed. Coloration white, a couple of fawn blotches near the ventral margin. Internally the space inside the pallial line is pink, the rest white. Interior of margins smooth. Teeth rather like that of preceding, but hinge line comparatively stouter, as if the little shell were mature.

Breadth, 8 mm. : height, 7 mm. : depth of single valve 2 mm. Type locality as given above.

Nothing comparable has yet been seen from Queensland, although the shell has a vague resemblance to some shells of the *sulcata* group.

**Pitarina osmunda**, sp. nov.

(Plate xx, figs. 9, 9a.)

A note after the genus *Pitaria* in the New South Wales check-list reads : “ *Pitaria citrina* was by Deshayes (Cat. Conchif. Brit. Mus. 1853, p. 72) erroneously cited from Sydney.”

A small valve recalling shells collected in Queensland suggested that, even if Deshayes had erred, a species resembling *citrina* had lived here. Two larger valves, curiously enough a right and a left valve, were found at different times by Mr. W. L. Dingeldei, and comparison showed very little distinction from the tropical shells, but Lamarck's *citrina* has been determined by Hedley and recorded by Tomlin<sup>34</sup> as being equal to *Dione ustulata* Reeve<sup>35</sup> from the Swan River, and New Caledonia. The former locality would agree with Shark's Bay, whence Lamarck might have received his specimens. Swan River in Reeve's time included Shark's Bay, and Western specimens agree very closely with Delessert's figure<sup>36</sup> of Lamarck's species.

Queensland shells have the posterior end more rounded and the anterior end also less produced, but the Sydney shells differ from both in that they have the anterior end more produced than in either the Queensland or the Western Australian species and have the posterior end rounded as in the former. Moreover, whereas the extralimital species are smooth, the growth lines notable but not forming separate ridges, the local shell may be described as closely minutely ridged throughout save in its early stages, leaving the umbonal area smoothish. The coloration of the dead shells is dirty white, without and within, whereas the tropical shells are colored, but in generic characters the shells otherwise agree, and are therefore placed in *Pitarina* Jukes-Browne<sup>37</sup>, introduced with type *C. citrina* Lamarck.

The Sydney specimens are 39 mm. long by 32 mm. high, and 38.5 mm. by 31.5 mm., the two valves together having a breadth of 27 mm.

<sup>34</sup> Tomlin.—Proc. Mal. Soc. (Lond.), xv, 1923, 310.

<sup>35</sup> Reeve.—Conch. Icon., xiv, Oct., 1863, pl. xi, fig. 49.

<sup>36</sup> Delessert.—Recueil Coq. Lamarck, 1841, plate 8, fig. 8, a, b, c.

<sup>37</sup> Jukes-Browne.—Proc. Mal. Soc. (Lond.), x, 1913, p. 346.

A number of species appear to plaster the outside of their shells lightly with sand grains, the Queensland "*citrina*" being one, the so-called "*prora* Conrad" of Queensland another, "*australica* Reeve" a third, and thus they lead to the very peculiar genus, *Granicorium* Hedley, the subject of the succeeding note, which covers the whole of its shell with a thick crust of sand.

***Granicorium attonitum*, sp. nov.**

(Plate xx, fig. 17.)

In search of fish the trawlers have been exploiting the Continental Shelf north of Sydney, and Mr. W. L. Dingeldei, keeping in touch with the captains of the trawlers, has brought in many of the common species previously better known from the south. No appreciable difference has been detected in the majority of cases, giving a range of over twelve degrees of latitude. Some strangers from the north have been discovered and more are anticipated.

Mr. H. S. Mort brought in a valve procured by Captain Moller off Wattamolla just south of Sydney in 50–80 fathoms, which is of extraordinary interest, belonging to the genus *Granicorium*, founded by Hedley<sup>38</sup> upon a species dredged in the Capricorn Group. Hedley's largest specimen was 19 x 17 mm., but I was fortunate enough to secure in the same locality valves measuring up to 41 x 39 mm. Mr. Mort's specimen measured 32 x 29 mm., and differed very slightly in shape. Mr. Dingeldei then brought in a larger valve, also collected by Captain Moller off Shoalhaven Bight, New South Wales, in 45 fathoms. This specimen was at sight much more obese than the typical series, with a much larger lunule, and measures 43 mm. by 41 mm. with a depth of 19 mm., as against 14 mm., single valve only. But for the obesity of the shell, the good description given by Hedley is well applicable.

***Katelsysia enigma*, sp. nov.**

(Plate xx, fig. 13.)

A valve picked up by Mr. Ralph Blacket on the Manly Cove Beach is here figured; later he secured a second specimen. Since then Dr. K. K. Spence brought in two valves picked out of some dredgings from Parsley Bay, Port Jackson, and Mr. C. F. Laserson also found one at the same place. All these are dead, and it may be the species is extinct, and that these have been dug out of a layer below the normal Harbour floor. Otherwise it is very difficult to account for its discovery at this late date as it is a notable form. The specimens all agree in form, and differ from the southern species known as *K. strigosa* Lamarck<sup>39</sup> in their more equilateral shape and greater depth. The sculpture is very much the same, though apparently a little more regular in the local shells, but the proportions show that for the same length, 38 mm. the latter is 29.5 mm. in depth, the West Australian only 27.5 mm. The umbo in the local shell is at about the anterior third, whereas in the western shell it is at the anterior fourth. As seen in the figure the posterior end is much more rounded, the dorso-posterior side more curved.

<sup>38</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxxi, 1906, p. 477, pl. xxxviii, figs. 26–27, 19 Nov.

<sup>39</sup> Lamarck.—Hist. Anim. s. Vert., v, 1818, p. 605: King George's Sound, Western Australia.

Genus *Clementia*.

On the New South Wales list two species are included, *crassiplica* Lamarck and *papyracea* Gray, *C. strangei* Deshayes and *C. moretonensis* Deshayes respectively being given as synonyms. These two latter names should replace the two in use, as they were both described from Moreton Bay, South Queensland<sup>40</sup>, and the local shells agree, and differ from the North Queensland species. It may be noted that only *papyracea* Gray is on the Queensland list, so these two should be reinstated.

*Paratapes scordalus*, sp. nov.

(Plate xx, fig. 11.)

Recent acquisitions made necessary the reconsideration of the nomination of the shell listed by Hedley as *Paphia textilis* Gmelin<sup>41</sup>. Gmelin's species has for its references Lister, Knorr and Chemnitz (*textrix*), and localities Malabar Coast and Red Sea. Born<sup>42</sup> had introduced *undulata* for Knorr, Vergn. ii, tab. 28, fig. 4 (locality unknown) years before, and this name has been sometimes used for the same species as Gmelin's *textilis*. Chemnitz<sup>43</sup> was not binomial when he used the name *textrix*, but that name has also been used.

An overlooked name is that given by Meuschen<sup>44</sup> in the Index to Gronov. Zoophyl, who, for his *Venus angulosa*, cites Lister and Gualtieri, with locality Ceylon.

Tomlin<sup>45</sup> has recorded that *Tapes vernicosa* Reeve is the same as *undulata* Born, but Reeve's figure does not agree in anyway with that cited by Born. In chronological order Born, 1780, locality unknown, comes first, then follows Meuschen, 1783, with Ceylon, then *textrix* Chemnitz, 1784, nonbinomial, fig. 442 only, from the Malabar Coast, and then Gmelin, 1791, for the same species citing Malabar Coast and Red Sea.

The Sydney shell may be described thus. Shell elongate, shining, smooth inequilateral. Coloration: early portion of shell pale brownish cream, then pinkish painted with closely set angulate markings of a darker shade, less pronounced medially. The early portion of the shell is smooth, but a series of wavy ridges run along the medial portion of the valve ventrally; these do not reach either end of the shell, approaching the posterior but rather distant from the anterior.

Length, 46 mm.; height, 27 mm.; depth of conjoined valves 16 mm. Type from Sydney Harbour, New South Wales.

A more boldly painted shell from North Queensland is more heavily sculptured, while a similarly colored shell from the North Coast of New Guinea is quite smooth and agrees better with Lister's figure, and might be *undulata*, the latter being also separable by shape from the Sydney shell.

<sup>40</sup> Deshayes.—Proc. Zool. Soc. (Lond.), 1853, 1854, pp. 17-18.

<sup>41</sup> Gmelin.—Syst. Nat. pt. vi, 1791, p. 3230.

<sup>42</sup> Born.—Mus. Caes. Vindob., 1780, p. 67.

<sup>43</sup> Chemnitz.—Conch. Cab., vii, 1784, p. 48, pl. 42, fig. 442-443.

<sup>44</sup> Meuschen.—Index to Gronov. Zoophyl., pp. 671=271, No. 1160, 1783.

<sup>45</sup> Tomlin.—Proc. Mal. Soc. (Lond.), xv, 1923, p. 313.

**Aeritopaphia**, gen. nov.

(Plate xx, fig. 12.)

Type.—*A. transfusa* sp. nov.

Hedley included in the New South Wales list, *Paphia inflata* Deshayes,<sup>46</sup> following Angas' determination, but Deshayes' shell came from Ceylon, and it differs in proportions and sculpture from the local shell, which is therefore here described as new.

Shell large, somewhat obese, elongate, roundly oval, anteriorly produced, posteriorly rounded, ventral margin rounded. Coloration reddish fawn, indistinctly marked with darker angulate streaks, sometimes obsolete. There is a large, smooth lunule, distinctly marked off. The earlier portion of the shell is smooth, then strong concentric ridges are developed on the shell figured amounting to twenty-five, and a few weaker ones. Internally the shell is white, the hinge small, the teeth narrow, bifid, and prominent.

Length, 59 mm.; height, 43 mm.; depth of single valve, 17 mm.

Type from Sydney Harbour, New South Wales.

I proposed to replace *Paphia semirugata* of Hedley's list by *Paratapes polita* Sowerby, but suggested dissent. It now turns out that Sowerby's name is invalid as *Venus polita* Solander is recorded by Dillwyn,<sup>47</sup> as a synonym of *Venus textile* Gmelin = *undulata* Born, a congeneric species. However, from specimens available, Sowerby's shell might equally be the juvenile of the present species, so that, until series of both "*semirugata*" and "*transfusa*" are compared with the type of *polita* that name cannot be utilised. In the meanwhile there are no specimens of *semirugata* in the collection from New South Wales, and it can be entirely expunged from our List.

The only other local species placed under *Paphia* is *turgida* Lamarck, and according to Jukes-Browne this would be referable to *Tapes*, but the well-known specific name seems doubtful, as Lamarck described his species from "L'Océan des grandes indes," and he had few local shells. It appears to have been overlooked that Deshayes,<sup>48</sup> with Lamarck's types before him, pointed out that *Venus dorsata*,<sup>49</sup> described from New Holland, collected by Péron, differed in no essential manner from *turgida*, and had two pages priority. As Péron's collections were mainly western and southern Australian shells, probably *dorsata* = *turgida* is also a western Australian species.

Family **GLAUCONOMYIDÆ.**

This family is included in Hedley's New South Wales list, with the genus *Glauconomya*, and the species *G. angulata* Reeve. A curious series of complications is revealed upon investigation, as *Glauconomya* was credited to Bronn,<sup>50</sup> where it is found to be a *nomen nudum* without explanation. The earliest valid publication appears to be in Potiez and Michaud,<sup>51</sup> where the name is credited to Gray, with Gray's one species. Gray<sup>52</sup> had proposed *Glauconome* for the species *G. chinensis*

<sup>46</sup> Deshayes.—Proc. Zool. Soc. (Lond.), 1853, p. 8, pl. 19, fig. 3, 1854.

<sup>47</sup> Dillwyn.—Descr. Cat. Rec. Shells, 1817, p. 204.

<sup>48</sup> Deshayes.—Hist. Anim. s. Vert. (Lam.), ed. 2, vi, 1835, p. 350, footnote.

<sup>49</sup> Lamarck.—Hist. Anim. s. Vert., v, 1818, p. 593.

<sup>50</sup> Bronn.—Lethæa Geogn., 1838, p. 807.

<sup>51</sup> Potiez and Michaud.—Gal. Mol. de Douai, ii, 1844, p. 193.

<sup>52</sup> Gray.—Spicil. Zool., 1828, p. 6.

from China, and this name has been rejected as anticipated by Goldfuss in 1826, and thus *Glaucomya* came into use. Sherborn has now given us the date of Goldfuss's introduction<sup>53</sup> as being 1829, and thus Gray's *Glaucome* must come back into use.

***Glaucometta plankta*, gen. et. sp. nov.**

(Plate xx, fig. 16.)

Shell small for the family, thin, inequilateral, posteriorly beaked, equivalve, covered with a rather coarse periostracum, eroded at the umbones. Hinge rather strong, cardinals three, anterior largest and strongly bifid, no laterals. The pallial sinus is short, but deep and narrow, with a truncate tip. The external ligament is large and prominent. The anterior end is rounded, the posterior somewhat obliquely truncate, an ill-defined angle leading from the umbones to the lower angle, the ventral edge broadly rounded, subparallel to the dorsal.

Length, 26 mm.; breadth, 14 mm.

*Habitat.*—New South Wales. Type from Parramatta River, Sydney Harbour.

Genus ***Tellinota*, nov.**

(Plate xx, fig. 18.)

Type.—*T. roseola* sp. nov.

The Tellinids have been subdivided into groups, but the fine shell known as *Tellina abinella* Lamarck has not yet received a place. As the type of *Tellina radiata* Linné, is an American shell nothing like our species, that name cannot be used; *Angulus* Megerle may come into use for Hedley's *astula*, but cannot include this; *Tellinella* Gray may be available for the *virgata* Linné series which differs, so that the new genus *Tellinota* is proposed as above.

Shell fairly large, elongately oval, beaked, flattened, almost equilateral, a little inequivalve, surface partly striate, partly smooth; teeth weak, laterals distant, pallial sinus extremely large, running subparallel to the dorsal margin.

Coloration practically always rose, the beak and one-third of the remainder coarsely striate, all medium portion smooth and shining, finely striated at the anterior end.

Length, 65 mm.; height, 36 mm.

*Habitat.*—New South Wales. Type from Byron Bay.

***Pristipagia gemonia*, gen. et. sp. nov.**

(Plate xxi, fig. 6.)

The common Queensland shell known as *Tellina capsoides*<sup>54</sup> was provided by Jousseau<sup>55</sup> with a new (!) generic name *Pristis*, but that name was not new in any sense having been given to a Sawfish<sup>56</sup> many years before.

A curious little shell recalling *Pseudarcopagia botanica* was sorted out of the "Triton" dredgings, but upon investigation was found to be a small degenerate ally of the northern *capsoides*.

<sup>53</sup> Goldfuss.—Petref. Germ., 1, (2), 1829, p. 100.

<sup>54</sup> Lamarck.—Hist. Anim. s. Vert., v, 1818, p. 531.

<sup>55</sup> "Jousseau."—Lamy, Bull. Mus. Nat. Hist. Nat., 1918, pp. 24-29.

<sup>56</sup> Linck 1790, Latham 1794, Muller and Henle 1837, cf. Sherborn.



Shell small, thin, glassy, white, closely concentrically lirated, no radial striae, almost equilateral, strongly beaked. The hinge is strong, the cardinals prominent and the laterals large and widely separated, the external ligament small, a little sunken. The pallial sinus runs from muscle to muscle, subparallel to the dorsal angle of the shell.

Length, 18.5 mm.; height, 15 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour.

***Pinguimacoma hemicilla*, gen. et. sp. nov.**

(Plate xxi, fig. 7.)

Superficially this little shell recalled *Pinguitellina*, but upon examination was found to have no lateral teeth, a character of some importance. Shell small, thin, pinkish-white, inequilateral, a little swollen, smooth, growth lines showing only towards the ventral margin. The short beak is also smooth, and the hinge shows only cardinal teeth; the pallial line appears to agree with that of *Pinguitellina*, but is difficult to observe owing to the thinness of the shell. This is another of the forms which suggest that the loss of lateral teeth is recent, the hinge ligament probably compensating for this loss. From the species of *Pinguitellina* this little shell is separable externally by the short beak and more swollen anterior portion.

Length, 11 mm.; height, 9 mm. Type from Sydney Harbour "Triton" dredgings.

*Habitat*.—New South Wales.

Family **CORBICULIDAE.**

(= **Cyrenidae olim.**)

Master Consett Davies some years ago brought back from the Richmond River, northern New South Wales, a valve of a *Batissa*, which I now record as *Batissa australis* Deshayes<sup>57</sup> (plate xx, fig. 5), so that it may be looked out for. It is also probable that *Geloina* (olim *Cyrena*) may occur in northern New South Wales. The two genera occur together in Queensland, and can be separated by the striated lateral teeth of the *Batissa*.

The local valve measures 70 mm. in length, 57 mm. in height and 18 mm. in depth, and is rather regularly oval, less angulately, posteriorly than in northern specimens, with the cardinals placed together. Interiorly there is a violet tinge very characteristic of the group; this is entirely missing in the shells of the *Geloina* (= *Cyrena*) series.

***Milligaretta venta*, gen. et. sp. nov.**

(Plate xxi, fig. 8.)

Hedley<sup>58</sup> introduced the usage of the name *Psammobia lessoni* Blainville for the species previously known as *P. malaccana* Reeve, but indicated that the local shell differed, while Smith<sup>59</sup> many years before had observed that it should be generically named as it possessed lateral teeth. Shell of medium size for the family, transverse oval, almost equilateral, anteriorly rounded, posteriorly obliquely truncate. Coloration bluish-white with purplish rays, internally reddish-purple.

<sup>57</sup> Deshayes.—Proc. Zool. Soc. (Lond.), 1854, 1855, p. 346.

<sup>58</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxix, 1904, p. 196.

<sup>59</sup> Smith.—Rep. "Challenger," Zool., xiii, p. 93, 1885.

The sculpture consists of spaced concentric fine ridges smoothed anteriorly; with growth these change altogether, the posterior ridges vanishing, leaving a smooth area and the anterior developing strongly and angulately transversing the shell. The two bifid cardinal teeth are small and weak, laterals obsolescent in the Sydney specimen.

Length, 29 mm.; height, 14 mm. Type from Sydney Harbour.

*Habitat*.—New South Wales.

#### Genus *Flavomala*, nov.

Type—*Solen biradiatus* Wood.

Under the generic name *Soletellina*, two species appear in the Check List, *biradiata* Wood and *florida* Gould. In the first place these cannot be regarded as congeneric, and in the second, *florida* Gould is invalid, and neither can be referred to *Soletellina*. The former has been cited under the later name *flavicans* Lamarck as the type of *Psammotella* Blainville, by Kobelt<sup>60</sup>, who added that the type of *Psammotella* Deshayes was *Soletellina philippinensis* Deshayes. However, Blainville<sup>61</sup> did not use the Latin form, but only the French vernacular *Psammotelle*, and the first to latinise the word seems to be Herrmannsen<sup>62</sup>, who gave as the only species *Tellina rufescens* Chem. Curiously enough, this species was excluded by Blainville, though that does not concern us much. The type of *Soletellina* is *diphos*, a long beaked shell, while *biradiata* has no beak at all, but is fairly regularly ovate. The new genus, *Flavomala* (plate xx, fig. 19) is proposed, as *Psammotella* is unavailable. The smaller species, known as *florida* Gould, differs in texture and form, the umbo being much nearer the anterior end, and the teeth being more delicate. The new genus *Florisarka* is introduced, and the new specific name *F. onuphria* given to the type (Plate xx, fig. 14.) Shell of medium size, transversely oval, thin, covered with a thin periostracum. Coloration purplish, the periostracum brownish, the umbones worn whitish, internally purple with whitish blotches, rays obscurely seen externally. The hinge is very small and weak, with two small cardinals and no laterals, but supported by a strong external ligament. The pallial sinus is long and broad, reaching well past the middle of the shell. The umbo is nearly median, the dorsal margin a little angulate, the ventral almost straight. The anterior end is rounded and the posterior is a little truncate but also rounded. The foot is short, thick, and angulately spade-shaped, the siphons long, the inhalent very long and thicker, the orifices plain.

Length, 33 mm.; height, 19 mm. *Habitat*—New South Wales. Type from Manly Lagoon.

#### *Distugonia*, gen. nov.

(Plate xxi figs. 9, 9a.)

Type.—*D. inopinata* sp. nov.

A genus recalling *Tugonia*<sup>63</sup> and *Tugonella*<sup>64</sup>, the latter based on *divaricata* Reeve<sup>65</sup> which Jousseau regarded as different from *elliptica* A. Adams, but which Lamy considered to be the same.

<sup>60</sup> Kobelt.—*Illus. Conchyl.*, p. 328, 1881.

<sup>61</sup> Blainville.—*Dict. Sci. Nat. (Levr.)*, Vol. 52, 1828, p. 541.

<sup>62</sup> Herrmannsen.—*Index Gen. Malac., Suppl.*, Dec., 1852.

<sup>63</sup> Gray.—*Recluz, Rev. Zool.*, ix, 1846, (May), pp. 168, 174.

<sup>64</sup> Jousseau.—*Le Naturaliste*, 13th year, p. 202, 1891.

<sup>65</sup> Reeve.—*Conch. Icon.*, xiv, pl. 1, f. 2, February, 1863: Ceylon.

Shell small, thin, very swollen, tapering posteriorly where the shell gapes. Shell limy white, the only sculpture being rather strong growth lines. The umbonal area shows a small rather regular oblong shell, which develops and swells posteriorly, while the anterior end becomes comparatively more compressed ventrally but does not close. There are no laterals, but medially a large irregular spoon-shaped process is developed carrying the ligament into an internal socket. There is a shallow curved pallial sinus.

Length, 21 mm.; height, 16 mm.; depth of conjoined valves, 15 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

### ***Ensiculus hilaris*, sp. nov.**

(Plate xx, fig. 15.)

For the species included in the check list under the name *Cultellus cultellus* L. the name *Ensiculus hilaris* is proposed. *Cultellus* was introduced by Schumacher<sup>66</sup> for his *C. magnus* = *Solen lacteus* Spengler, which is very different from *Solen cultellus* Linné which H. Adams<sup>67</sup> separated under the generic name *Ensiculus* which should be used. Linné's *cultellus* has for its first reference "Rumph" and Amboina as the locality, and Dunker<sup>68</sup> even separated the Port Essington shell as distinct from that. Sowerby<sup>69</sup>, notoriously careless in the discrimination of species, ranged Dunker's species as a synonym of the Linnean one.

The local shell is more rounded anteriorly and more attenuate posteriorly than the northern one.

The type from Sydney Harbour measures 59 mm. long by 18 mm. high.

### Family TEREDINIDAE.

Hedley recognized only two species in his New South Wales check list, *edax* Hedley and *saulii* Wright, both under the generic name *Nausitoria*. An intensive investigation into the boring organisms attacking harbour piles in Port Jackson carried out by Messrs. Roy Johnson, F. McNeill and myself during the past five years resulted in the recognition of many species in this locality alone. A report has been published by the Sydney Harbour Trust<sup>70</sup>, and in it the following species were described and figured, all from Sydney Harbour:—*Teredo austini* Iredale (p. 29, pl. i, figs. 1–4); *Teredo shawi* (p. 30, pl. i, figs. 5–8); *Teredo balatro* (p. 31, pl. ii, figs. 4–7); *Teredo pertingens* (p. 31, pl. ii, figs. 8–11); *Nototeredo edax* Hedley (p. 32, pl. ii, figs. 1–3); *Nototeredo remifer* Iredale (p. 32, pl. iii, figs. 1–4); *Bankia debenhami* (p. 34, pl. iii, figs. 5–8); *Bankia rosenhali* (p. 35, pl. iii, figs. 9–12); *Bankia archimima* (p. 35, pl. iv, figs. 5–8); *Bankia occasiuncula* (p. 36, pl. iv, figs. 1–4); and *Nausitoria messeli* (p. 37, pl. iv, figs. 9–12).

The subgenera *Pingoteredo* (p. 30) with type *Teredo shawi* Iredale, *Deviobankia* (p. 33) with type *Bankia debenhami* Iredale, and *Inequarista* (p. 37), with type *Nausitoria messeli* Iredale, were also introduced. A subgenus *Dicyathifer* was also proposed for the Queensland shell known as *Nausitoria manni* Wright as determined and figured by Calman.

<sup>66</sup> Schumacher.—Essai nouv. Syst. Test., 1817, pp. 43, 130.

<sup>67</sup> H. Adams.—Proc. Zool. Soc. (Lond.), 1860, 369.

<sup>68</sup> Dunker.—Proc. Zool. Soc. (Lond.), 1861, 423, 7 April, 1862.

<sup>69</sup> Sowerby.—Conch. Icon., (Reeve), xix, 1874, pl. vi, fig. 23.

<sup>70</sup> Iredale, Johnson and McNeill.—Destr. Timber by Marine Organisms, 1932, pp. 24–40, pls. i–iv, 5 text figs.

***Notohaliotis ruber* Leach.**

The invalidity of Martyn's names causes a complication in the case of *Haliotis naevosum*, and it becomes doubtful whether the name can be retained. Gmelin introduced *Haliotis gigantea* from Chemnitz, who confused Japanese and Australian species and synonymised Martyn's plate, giving only New Holland as a locality. The confusion was continued until Deshayes<sup>71</sup> separated the two, allotting *naevosa* to our shell but crediting it to New Zealand. In the meanwhile, however, Leach<sup>72</sup> had described and figured *Haliotis ruber* from New Holland, obviously the Sydney shell.

Cotton and Godfrey<sup>73</sup> have recently subdivided the South Australian *Haliotis* into subgenera, proposing *Notohaliotis*, with type *H. naevosa* Martyn. Their name is here used generically, as there is no definite usage of *Haliotis* yet settled, but in any case it will be inapplicable to this group.

***Minolops gertruda*, sp. nov.**

(Plate xxi, fig. 11.)

Among some shells brought in by Mr. W. L. Dingeldei, collected by Captain Moller from off Cape Hawke, northern New South Wales, in 45-50 fathoms, was this new *Minolops*, a very unexpected find. It recalls *emendata* Iredale, but is more conical, with a narrower umbilicus, the base more strongly concentrically corded and lacks the strong radial threads.

Shell depressedly conical, broader than high, mouth very large, spirally striate throughout. Coloration pale dirty pinkish fawn, flamed with dull crimson, the flames persisting on to the base but not into the umbilical area. On the penultimate whorl seven liræ can be counted below the shoulder, but on the last whorl the subordinate threads increase at the expense of the liræ so that the whole of the whorl is concentrically threaded, even the shoulder, and a dozen or so major threads can be distinguished.

Height, 6.5 mm.; breadth, 10 mm.

*Habitat*.—New South Wales.

***Benthastelena*, gen. nov.**

(Plate xxi, fig. 12.)

Type.—*B. katherina* sp. nov.

Suggesting itself as a deep water representative of *Astelena*, this genus differs at sight in the absence of the umbilicus. Thiele<sup>74</sup> has dismissed the genus *Astelena* because the name reads like *Astele*, a very unscientific procedure, as I had pointed out that there was no real relationship between the two. The present form has also probably little real affinity with *Astelena*, but the general facies suggests that genus.

Shell small, regularly trochoid, imperforate. Coloration deep brownish-fawn, the apical whorls darker (probably animal seen through thin shell), and the base much paler. The apex has the usual raised, rather tilted, smooth initial whorl,

<sup>71</sup> Deshayes.—Hist. Anim. sans Vert. (Lam.), 2nd ed., ix, 1843, p. 34.

<sup>72</sup> Leach.—Zool. Miscell., i, 1814, p. 54, pl. xxiii.

<sup>73</sup> Cotton and Godfrey.—South Austr. Nat., xv, 1933, p. 16, 30 November.

<sup>74</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 49.

succeeded by the adult sculpture, which begins as two strong concentric keels cut into nodules by longitudinal ribs. Almost immediately the upper row increases its nodulation into triangular projections, the lower one on the other hand almost decreasing in strength, which it actually does on the later rows. There are seven adult whorls, and the last one has two strong keels, the upper one encircling the periphery and developing about a dozen triangular subspinose nodules. The lower one has a plain keel, but in between there is a finely crenulated keel, the remains of the original second keel; on each side of it is a spiral thread. The shoulder shows seven fine liræ, two of them larger and nodosely crenulate, four others finer and finely crenulate, but the seventh, the one above the peripheral spinose keel, is quite plain. On the base fifteen flattened liræ can be seen, finely threaded between with growth striæ; the four surrounding the umbilical depression are crenulate, the others plain. The outer lip is thin, the columella a little curved and forming an angular tip with the aperture, the inner lip reflected, entirely closing the umbilicus.

Height, 12 mm.; breadth, 11 mm.

Type from 110 fathoms east of Sydney.

*Habitat*.—New South Wales. On the Continental shelf, in the deeper water.

The only other deep water Trochoid on our list is the *Trochus glyptus* Watson<sup>75</sup>, which Hedley at last located under *Solariellopsis*, but it appears to be really a deep water derivative of the true *Astete*, though obviously generically distinct, and is here named *Mazastele*, the sculpture being very beautiful, and the sutures sunken instead of being shouldered, the umbilicus being also proportionately much wider.

#### *Ninella torquata* Gmelin.

The rejection of Martyn's names necessitates a change in the usage for the extraordinary but common Sydney shell listed by Hedley as *Turbo stamineus*. Erroneously recorded from New Zealand by Martyn, it also appeared in the Portland Catalogue from that locality under the name *Turbo singularis*, "remarkable for the singular shape of its operculum," and Humphrey, in the Mus. Calonn., continuing this specific name, gave the correct locality "Port Jackson, New South Wales" from information received by the early colonists here. Gmelin had, however, named *Turbo torquatus*, citing Martyn's plate, and also referring to Chemn. conch., 10, p. 295, 6, vign. 24, f. AB. This specific name must therefore be used, and the generic name *Ninella* Gray<sup>76</sup> proposed for it alone will be available, so that *Ninella torquata* Gmelin will replace *Turbo stamineus* Martyn, while Thiele (Handb. syst. Weicht., i, p. 68, 1929) has introduced *Subninella*, naming *T. undulatus* Martyn (= *undulatus* Solander) as type.

#### *Partubiola*, gen. nov.

(Plate xxi, fig. 13).

Type.—*P. blancha* sp. nov.

*Tubiola* was introduced by A. Adams<sup>77</sup> for a series of tropical shells, of which the type was fixed by Kobelt<sup>78</sup> as "*nivea* Ch.," but of which the type is given by Thiele<sup>79</sup> as *cornuella* A. Adams, and the genus is cited as a questionable section of

<sup>75</sup> Watson.—Rep. Zool. "Challenger," xv, 1886, p. 75, pl. 6, fig. 6.

<sup>76</sup> Gray.—Figs. Moll. Anim., iv, 1850, p. 87.

<sup>77</sup> A. Adams.—Proc. Zool. Soc. (Lond.), 1863, p. 74.

<sup>78</sup> Kobelt.—Illustr. Conchylienbuch, 1878, p. 154.

<sup>79</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 60.

*Skenea* Fleming, a genus of small British shells, an extraordinary association. Specimens recalling the form of *nivea* have been collected in Queensland, though not yet on record, but a beautiful little shell of similar facies was picked out of the harbour dredgings, and upon critical examination is named as above.

Shell small, discoidal, glassy, spire flattened, widely umbilicate, white. The apex is remarkable, being small and glossy, but consisting of about three whorls of turbinate form, and ending in a varix; there are about three adult whorls with a regular sculpture of spiral liræ, the interstices being threaded with fine growth striæ. These liræ number seven or eight on the penultimate whorl, the suture deep, and on the last whorl sixteen can be counted, of which six are on the base, the last one bounding the umbilical cavity which is large, funnel-shaped, and shows only spiral threads crossed by rather strong growth striæ. The aperture is a little oblique, and the outer lip recedes rather rapidly and sinuously to meet the columella, which curves upward, and makes a thick glaze across the body whorl to meet the lip again.

Major diameter, 5.25 mm.; minor diameter, 4.75 mm.; height, 2 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

#### *Liotina scalaris* Hedley.

(Plate xxi, fig. 15.)

Hedley<sup>80</sup> named a *Liotia tasmanica* var *scalaris* from off the Crookhaven River, 11–15 fathoms, but did not figure the specimen, as the mouth was imperfect. His specimen is now figured, as it is a distinct species, another specimen having been found, also with the mouth incomplete, in 110 fathoms east of Sydney, agreeing in all essential features.

#### *Larinopsis ostensus*, sp. nov.

(Plate xxiv, fig. 17.)

Twenty-five years ago Gatliff and Gabriel<sup>81</sup> described a very strange marine shell dredged from five fathoms in Western Port, Victoria, as *Larina* (?) *turbinata*. As *Larina* was a freshwater genus, Hedley deferred to this location, and suggested the marine genus *Pellilitorina*. The authors of the species rightly objected to this transfer, and proposed instead a new genus *Larinopsis*<sup>82</sup>, but without indicating any family.

Mr. W. L. Dingeldei brought in a beautiful shell trawled by Captain Moller in 65 fathoms off Jarvis Bay, New South Wales, and this provides a second species of the genus, an addition to our list. Unfortunately the animal had decayed before it was received, and the operculum was lost, so that there are no further characters to add to the original description.

Shell of small size, turbinate, uncoiled, thin, transparent, white. Whorls five, the apical one small, incurved, smooth, the succeeding ones showing deep suture which separates after the second adult whorl, the next three being quite free. Only fine growth striæ can be seen. The aperture is a little irregularly circular, the thin edges even a little reflected.

Height, 17 mm.; breadth, 15 mm.

*Habitat*.—New South Wales. On the Continental shelf.

<sup>80</sup> Hedley.—Austr. Mus. Mem., iv, 1902, p. 336, 29 July.

<sup>81</sup> Gatliff and Gabriel.—Proc. Roy. Soc. Vict. (N.S.), xxii, p. 35, pl. xiii, Sept., 1909.

<sup>82</sup> Gatliff and Gabriel.—Proc. Roy. Soc. Vict. (N.S.), xxix, p. 104, Oct., 1916.

Thiele<sup>83</sup> has placed this genus under *Megalomphalus* in the family Fossaridæ, with which it has apparently nothing whatever to do either as to conchological characters or anatomical features. His taxonomic work is just as unsatisfactory, as he includes the family in his "Stirps Amaltheacea" using a family Amaltheidæ based on the genus *Amalthea* Schumacher 1817, though Schumacher's name had been shown to be invalid many years ago<sup>84</sup>.

Genus **Smaragdista**, nov.

(Plate xxi, fig. 14.)

Type.—*S. trigena* sp. nov.

A not uncommon shell among the "Triton" dredgings from Sydney Harbour was a second species of "*Neritina*," which I left as "*Neritina rangiana* auct"<sup>85</sup> noting that I would attend to its correct naming later.

Baker<sup>86</sup> did not mention it specifically, but under *Smaragdina* he gave as range "West Indies; Mediterranean; Indo-Pacific?" the last locality apparently referring to this and allied species. Thiele, lumping through lack of local knowledge and conditions, has given a figure of the radula of "*rangiana* Recluz" as typical of *Smaragdina*, contending that the radular distinctions given by Baker for *Smaragdella* are worthless. However the shells are distinctly separable, and I therefore propose the new generic name *Smaragdista* for the new species *S. trigena* described as follows.—

Shell very small, globose, spire a little elevated, imperforate.

*Coloration*.—Bands of squarish blotches and separate longitudinal marks arranged in parallel, encircling the whorls and sometimes massing into continuity towards the mouth. Ground color generally white or pinkish, the blocks and bands pink and purple. There are no longitudinal streaks so characteristic of *Smaragdella*.

The apical whorl persists as a small glassy tip, then of the next three whorls the first is wound almost planately, the last descending rather rapidly. The whole surface smooth and shining, showing faint growth lines under the lens. Aperture semicircular, outer lip thin, columella straight, with eight small irregular teeth placed medially, the inner lip spread as a heavy smooth glaze almost as large in area as the aperture.

Height, 7 mm. : width, 6 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour.

A dead specimen of the "*oualanensis* Lesson" series was also found, but as it is a very common and attractive shore species of North Queensland, the species will not be admitted without confirmation. It was included by Baker in his *Vittoclython* introduced for *N. meleagris* Linné of the West Indies, but Baker remarked upon the notable differences in the radula. The new generic name *Pictoneritina* is introduced, the species *N. oualanensis* Lesson being named as type. The columellar dentation is very irregular and obscure and the painting consists of streaks.

<sup>83</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 239.

<sup>84</sup> Iredale.—Proc. Mal. Soc. (Lond.), ix, 1911, p. 263.

<sup>85</sup> Iredale.—Rec. Austr. Mus., xvii, 1931, p. 210.

<sup>86</sup> Baker.—Proc. Acad. Nat. Sci. Philad., xxv, 1923, p. 173.

***Cellana tramoserica* Sowerby.**

Comparatively recently the limpet known as *Patella tramoserica* was discussed fully by Hedley<sup>87</sup>, and it was clearly shown that Martyn's *tramoserica* was not the common Sydney shell, but that Chemnitz later used the name for our species. Thereupon Martyn's name was rejected, and Blainville's *variegata* brought into use. The disqualification of Martyn as a binomialist allows the recognition of any later use of the name *tramoserica*. Chemnitz was also not a binomialist, but Sowerby<sup>88</sup> legalized the use of Chemnitz's name prior to Blainville's introduction of *variegata*. Consequently reversion to *tramoserica* seems certain, and the only change will be the use of *Cellana* in place of *Patella* or *Helcioniscus*.

***Bembicium nodulosum* Gray.**

This was given as the name to be used for the Harbour or Mangrove form of *Bembicium*, and it was figured under that name by Musgrave<sup>89</sup> upon my recommendation. Upon re-investigation the name *nodulosum* proved to be a pure *lapsus*, and its first publication appears to have been in Musgrave's article as above cited. There appears however to be a valid earlier name which has not been used, but whose right seems indisputable. In the Zoological Report of the Novara Mollusca a *Risella kielmannseggi* was named and figured by Frauenfeld<sup>90</sup>, having been previously described by Zelebor. Apparently Suter<sup>91</sup> had not access to this account as he cited the name as a synonym of *Astraea sulcata* subsp. *davisii* Stowe, though it had priority, and was localised from New Zealand. Had Suter been able to see the figure he would certainly have rejected the name. The "Novara" called only at Sydney, New South Wales, and Auckland, New Zealand, in our waters. The "Novara" figure is an excellent one of our shell, and is nothing much like the young of the Neozelanic "*Astraea*," i.e., *Cookia*. The "Novara" naturalists collected in Botany Bay where they could easily get this species, which must now be called *Bembicium kielmannseggi* Zelebor.

**Family FOSSARIDÆ.**

Hedley<sup>92</sup> placed in this family a species he described as *Fossarus sydneyensis*, and gave an excellent figure. Our species lives under stones at Long Reef, near Manly, New South Wales, and is obviously not congeneric superficially with the Palearctic true *Fossarus*. It would be better placed in the family Siriidæ. A new generic name *Anafossarus* is introduced for this species alone, and it will be later studied in detail. It recalls some of the shells placed under *Couthouyia*, showing an umbilical chink, but is much more solid.

<sup>87</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxxix, 1914, (1915), p. 714.

<sup>88</sup> Sowerby.—Cat. Shells Tankerville, 1825, p. 30, January.

<sup>89</sup> Musgrave.—Austr. Mus. Mag., iii, 30 April, 1929, p. 344, fig. in text.

<sup>90</sup> Frauenfeld.—Reise Novara, Moll., p. 9, pl. 1, fig. 11.

<sup>91</sup> Suter.—Man. New Zeal. Moll., 1913, p. 168.

<sup>92</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxv, 1900, p. 89, pl. 3, fig. 12.



Genus **Difalaba**, nov.

(Plate xxi, fig. 16.)

Type—*D. opiniosa* sp. nov.

Shell small, elongate, thin, ten-whorled, whorls a little rounded, subvaricose, striate, mouth oval, outer lip thin, columella sinuate, imperforate. Coloration of dead shell white with a few brown streaks. Varices irregular and showing as raised rounded ribs only. The sculpture is really fine grooves with flat-topped liræ, about six on the penultimate whorl and fifteen on the last whorl.

Length, 5.5 mm.; breadth, 2 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

This looks like an elongated "*Diala*," as the name is used in Australia, but that name covers two or three distinct groups. *Alaba* was once used for similar shells, but is now restricted to American shells like the type. Thiele<sup>93</sup> has figured a shell as the type of *Alaba*, *A. melanura* C. B. Adams, which does not seem like the original species.

Genus **Ataxocerithium**.

Under the generic name *Ataxocerithium* Hedley allowed only one species, *serotinum*, ranging *rhodostoma* as a synonym. A. Adams<sup>94</sup> described *Cerithium serotina* from Van Dieman's Land following it with *Cerithium rhodostoma* from unknown locality (fig. 103). The former was elongate with reticulate sculpture, mouth expanded, canal open, with little reflection of inner lip, while the latter was smaller and broader, sculpture coarser, mouth less expanded and canal still open. Whether these are identical or not, two corresponding forms occur throughout New South Wales, one elongate like *serotina*, with much finer sculpture, inner lip much expanded and the canal closed; the other broad like *rhodostoma*, with even finer sculpture and inner lip and outer lip still more expanded, and of shorter growth with fewer whorls.

These, when trawled, show different apices, and constitute a neat problem in the study of protoconchs, as apart from the essential differences seen the shells appear to coincide in every general feature.

**Ataxocerithium conturbatum**, sp. nov.

(Plate xxi, fig. 17.)

Among the "Triton" dredgings in Sydney Harbour were found specimens of a long delicate *Ataxocerithium* which is here described. Shell elongate, narrow, very finely sculptured reticulately, many whorled (thirteen adult whorls) mouth subcircular, canal closed. Coloration cream. Apical whorls four forming a long glassy protoconch succeeded by longitudinal and spiral ribs developing into a fine reticulation. The antepenultimate whorl shows two main spiral ribs with about four subsidiary ones crossed by about twenty longitudinals forming nodules at their intersections. The nodulation becomes obsolete on the last whorl and is missing

<sup>93</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 210.<sup>94</sup> A. Adams.—Thes. Conch. (Sow.), ii, 1855, pl. clxxx, fig. 102.

on the base, where five flat liræ with striated interstices only exists. The columella is straight, the inner lip erected as an upstanding flange, a thick glaze crossing the body whorl to meet the outer lip, which extends in a circle to meet the columella and close the short slightly recurved canal.

Length 16 mm.; breadth 6.5 mm. Type from Sydney Harbour.

*Habitat.*—New South Wales.

**Ataxocerithium seruposum**, sp. nov.

(Plate xxi, fig. 18.)

Shell elongate, thin, resembling the last described, but with the longitudinals fewer and more pronounced and with more tendency to the pagoda-like form seen in the next species. The apical whorls are about three and a half, thin, glassy, the protoconch long and attenuate, the succeeding ones reticulate, the longitudinals more prominent. On the antepenultimate there are about sixteen longitudinals crossing about four major spiral cords with a couple of minor ones below the suture, the nodulation being less marked.

Length, 12 mm.; breadth, 6 mm. Type from 70 fathoms off Green Cape.

*Habitat.*—New South Wales. All along the Continental Shelf.

**Ataxocerithium applenum**, sp. nov.

(Plate xxi, fig. 19.)

Shell very similar to the two preceding but shorter and notably broader, the apex consisting of one tumid whorl with the tip incurved and with only ten succeeding adult whorls. The whorls overhang each other a little, giving a pagoda-like effect, while the base is flattened. The longitudinals are more notable as in the preceding case, but in almost every detail of sculpture, form of mouth, columella, there is agreement with the two former species.

Length, 14 mm.; breadth, 7 mm. Type from 70 fathoms off Green Cape.

*Habitat.*—New South Wales. All along the Continental Shelf.

The occurrence of these species with different apical whorls is interesting, and needs careful investigation, but as protoconch features are regarded as of great importance, this form is made the type of a new subgenus, *Geminataxum*, to keep the matter under review.

**Pyrazus ebeninus** Bruguière.

When Hedley<sup>95</sup> discussed the name for the famous Sydney Whelk, he concluded that Martyn's name *Clava herculea* should be used, but as now Martyn's names are to be rejected, the previously used name *ebeninus* Bruguière will be revived. The generic name *Pyrazus* will, however, be continued for this species alone.

Finlay<sup>96</sup> has published my notes about Neozelanic and Australian species of *Cerithidea*, introducing *Zeacumantus* for *subcarinata* Sowerby, of which *tricarinata* Hutton is a synonym, and recording it from Freshwater, near Manly, New South

<sup>95</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxx, 1905 (1906), p. 529.

<sup>96</sup> Finlay.—Trans. New Zeal. Inst., lvii, (23 Dec., 1926), p. 380.

Wales. This is an extraordinary addition to our fauna, as the Neozelanic species appears to have established itself in our waters without any record of its introduction. It is now certainly acclimatized, though it must have reached here only in recent years, as Angas, Brazier, Hedley and others did not collect it.

*Zeacumantus* includes the Tasmanian *diemenensis* Quoy and Gaimard, but not *australis* Quoy and Gaimard, which is here made the type of a new genus, *Velacumantus*. This genus differs in size and shell features, the mouth being more compressed, both canals less pronounced, and the inner lip not produced over the body whorl. *Cerithium alternatum* Hutton<sup>97</sup> is not Neozelanic, but was based on a shell of this species.

The other species classed by Hedley under *Pyrazus*, *anguliferus* Sowerby, must be rejected, the species apparently being based upon an immature *P. ebeninus*.

Thiele<sup>98</sup> has proposed *Batillariella* for the South Australian *Bittium estuarinum*, and Cotton<sup>99</sup> has since introduced *Paracerithium* for *B. lawleyanum* Crosse, but *Paracerithium* had been used a long time before by Cossmann.<sup>100</sup>

### **Gazameda decoramen**, sp. nov.

(Plate xxi, fig. 20.)

Shell elongate, apex small and attenuate, base comparatively broad. Coloration pale red-brown, the keels white, marked with pale red-brown blotches. Apical whorls and succeeding four, white, the apex consisting of two whorls, the tip inverted, smooth, the four succeeding whorls also smooth. Then the adult sculpture begins with a subsutural ridge and a peripheral stronger one, the intervening space finely concentrically striate and marked by curved growth lines. On the tenth adult whorl, the largest I have, the periphery is girdled with two rounded ridges, and the flattened base is rather coarsely spirally striate. The columella is a little curved, ending in a pseudo-gutter, the aperture rather square, the outer lip thin, deeply sinuate.

Length, 18 mm.; breadth at base, 6.5 mm.

*Habitat*.—Continental Shelf of New South Wales. Type from 65–70 fathoms off Sydney.

Also, as far north, has occurred *Ctenocolpus australis diffidens*, which I<sup>101</sup> described from off Gabo Island, Victoria.

### **Sirius meracus**, sp. nov.

(Plate xxi, fig. 21.)

The genus *Sirius* was erected by Hedley<sup>102</sup> for a shell described as *Raulinia badia* by Tenison-Woods.<sup>103</sup> I<sup>104</sup> have introduced two curious shells from the Harbour dredgings as *Opposirius idoneus* and *Dolichosirius cupiens*, and suggested a family Siriidae to include these. I now add a second species of the genus *Sirius* from the

<sup>97</sup> Hutton.—Cat. Marine Moll. New Zeal., 1873, p. 26.

<sup>98</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 209.

<sup>99</sup> Cotton.—Rec. South Aust. Mus., iv, 1932, p. 539.

<sup>100</sup> Cossmann.—Bull. Soc. Geol. France, ii, 1902, p. 173.

<sup>101</sup> Iredale.—Rec. Austr. Mus., xiv, 1925, p. 267, pl. xliii, fig. 17.

<sup>102</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxv, 1900, p. 88.

<sup>103</sup> Tenison-Woods.—Proc. Linn. Soc. N.S.W., ii, 1876, p. 264.

<sup>104</sup> Iredale.—Rec. Austr. Mus., xviii, 1931, pp. 210–211.

Continental Shelf, and further find that in this case there is a notable geographic variation. The species is easily distinguished from the type by its smaller size, its more pronounced sculpture, and its narrow umbilical fissure.

Shell four-whorled, small, delicate, turbinoid, the minute apex inverted.

Coloration pale fawnish-white, chalky white after death. The apical whorls start off with keels. Four are clearly seen on the second whorl, which becomes shouldered; on the third whorl the shoulder shows a couple of threads with four strong keels, the whole closely, longitudinally, obliquely threaded; while on the base there are half a dozen weaker keels, a narrow umbilical fissure, and a rather strong columellar nodule basally. Outer lip thin, anterior canal only indicated.

Height, 4.5 mm.; breadth, 2.5 mm.

*Habitat.*—Continental Shelf of New South Wales. Type from 70 fathoms off Green Cape.

Specimens from 100 fathoms off Port Macquarie are shorter and broader, the liræ stronger, three on shoulder, all overridden by growth striæ sinuously, canal more pronounced and umbilical chink less developed. The type measures 4 mm. x 3.5 mm., and may be called *S. m. desponsus* subsp. nov.

Specimens from 100 fathoms off Cape Pillar, South Tasmania, are larger, much more elate, with the sculpture much more defined, the longitudinal striæ being well-marked, and the spirals very distinct, umbilical chink smaller. The type measures 6 mm. x 4.5 mm., and is here named *S. m. chrestus* subsp. nov.

At the last moment Master John Laseron brought in a shell dredged in North Harbour, Port Jackson, which is of great interest as being the first representative of the debated *Separatista* group from New South Wales. It differs decidedly from *S. gabrieli* Pritchard and Gatliff, and is much more like, and intermediate between *Trichotropis gracilentia* and *tricarinata* Brazier<sup>105</sup> from Torres Straits, later figured by Hedley.<sup>106</sup> The former measured 5.5 mm. by 2.75 mm., and the latter 5.5 mm. by 4.5 mm., while the Sydney shell measures 5.5 mm. by 3.75 mm., with the mouth attingent, not free as in the lastnamed. It may be named *Separatista fraterna* sp. nov.

#### Genus *Halotapada*, nov.

(Plate xxi, fig. 22.)

Type.—*H. nubila* sp. nov.

This strange little shell has somewhat the appearance of a dead *Succinea*, but shows a marked umbilical chink, recalling that associated with *Couthouyia*.

Shell thin, of rather papery texture, spire short, aperture large oval, complete.

Colour, pale dirty white. Sculpture, strong curved growth lines only, which are pronounced on the last whorl, but on the earlier whorls there appears to be an underlying fine concentric striation. Apex minute, tip shining, whorls four, rounded, sutures deep. The body whorl forms the bulk of the shell. Mouth oval, anteriorly a little pointed, outer edge thin, well curved, columella curved, a little reflected, crossing over as a glaze to join the outer lip. A deep narrow umbilical fissure is present.

Length, 6 mm.; breadth, 4 mm.

*Habitat.*—New South Wales. Type from 65 fathoms of Jervis Bay.

<sup>105</sup> Brazier.—Proc. Linn. Soc. N.S.W., i, 1877, p. 313.

<sup>106</sup> Hedley.—Rec. Austr. Mus., iv, 1901, p. 126, pl. xvii, figs. 22 and 23.

Genus **Tropidorbis**, nov.

(Plate xxiv, fig. 1.)

Type.—*T. mendicus* sp. nov.

The genus *Naricava* was introduced by Hedley<sup>107</sup> for *Adeorbis angasi* A. Adams and Angas, and he included in his genus *A. vincentiana* Angas 1880, *A. angulata* Hedley 1905, and *A. kimberi* Verco 1907. He referred to *Laciniorbis* as being perhaps related, but observed that the peculiar apex of *Naricava* was missing from that group. That characteristic apex was also absent in *A. kimberi*, so that a new generic name must be introduced for the group. The type, named above, seems to be the eastern representative of *A. kimberi*, but is larger and more compact. Shell small, hemispherical, thin, strongly keeled, umbilicate, base flattened. The apex is large, planate, tip inturred, marked off by a varix, smooth. Breadth 5.5 mm.

Pilsbry<sup>108</sup> described *Adeorbis sigaretinus* from Rockhampton, Queensland, and this species is small, thin, discoidal, widely umbilicate, periphery rounded, and is of four to five whorls, the apical whorls very small and glossy and the rest of the shell sculptured with fine concentric lines; this is here made the type of a new genus, *Sigaretornus*.

Thiele<sup>109</sup> has included a family *Adeorbidae*, comprising a somewhat heterogeneous conglomeration of apparently unrelated species. The group-association and nomination are very unsatisfactory, as much systematic work appears to have been overlooked and incongruous attachments made.

Firstly, many years ago, *Tornus*<sup>110</sup> was proved to be the correct name of the group called *Adeorbis*, and has been used by most systematic workers since.

Secondly, *Naricava* Hedley is made an absolute synonym of *Cochiolepis*, an East American group, of which is written "Das Tier ist ähnlich wie bei *Adeorbis*," which does not apply to the Australian mollusc, whose shell features, especially those of the apex, differ. Then, as a sub-genus, *Laciniorbis* is added, but this has no close relationship conchologically with *Naricava*, and the animal is also unknown.

The inclusion of *Mecoliotia*, *Pickworthia* and *Reynellona*, on conchological grounds alone, is indefensible, and Thiele has entirely missed Bavay's<sup>111</sup> indication that *Pickworthia* should be superseded by *Sansonia* Jousseaume<sup>112</sup>, a genus not recorded at all in the Handbuch.

Family **SCALIDAE**.

This family contains very beautiful shells, the famed "*Scala pretiosa*" being one of the most valued of shells of older conchologists, and still a fine acquisition to any collection. It would be surmised that on account of their beauty the species would be well known, and it is surprising to find that the Australian species have been little worked at. The southern Australian forms have been catalogued by May, Pritchard, Gatliff, Gabriel, Verco, Cotton and Godfrey, but the lists of New South Wales and Queensland drawn up by Hedley were compilations only, and do not show the number of existing species. This is mainly due to the fact that Boury made a lifelong study of the group, and his projected work was never completed. Many sections were proposed by Boury, and such, as are applicable, are here made use of. The generic

<sup>107</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxxviii, p. 294, 5 Nov., 1913.

<sup>108</sup> Pilsbry.—Proc. Acad. Nat. Sci. Philad., 1897, p. 363, pl. ix, figs. 4-6.

<sup>109</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 174.

<sup>110</sup> Tredale.—Proc. Malac. Soc. (Lond.), xi, 1914, p. 171.

<sup>111</sup> Bavay.—Journ. de Conch., lxxvi, 1922, p. 155.

<sup>112</sup> Jousseaume.—Ann. Sci. Nat. (Paris), (7), xii, 1892, p. 344.

name *Scala* is preferred to Bolten's *Epitonium*, but the restricted group does not occur in New South Wales, though Queensland specimens closely approximate to *Scala scalaris* (L) of which the type locality is Amboina.

The New South Wales forms only will be here dealt with, as the Queensland ones will be reported upon in another place. Sixty years ago Angas listed five species only as *Scala australis*, *philippinarum*, *jukesiana*, *lineolata* and *scalaris*, a little later adding a new species, *morchi* and then later still, *hyalina* and *clathrus*. Watson, in the Challenger Report, added *aculeata*, apparently confusing two or three species, as he wrote "a very variable species." Whitelegge's list included all the above, three names only being changed, and there were added *granulosa*, *pyramidalis*, *bicarinata* and *delicatula*. Smith described two new species, *ballinensis* and *distincta*, and then Hedley introduced two more from deep water, *bellicosum* and *turrisphari*, and in his Check List allowed three others, *levifoliatum* var. *translucidum*, and *unilaterale*. The last two were errors and must be omitted at present, leaving according to Hedley's List fourteen species of this family in New South Wales waters.

Captain Comtesse, Messrs. E. F. Nash, H. S. Mort and W. L. Dingeldei all became interested in these shells, as they could discriminate so many species in the "Triton" dredgings and at the Dundas dump. Captain K. Moller also sorted out from the trawler's net some beautiful species, and others had been dredged and trawled, so that Hedley's number is now here nearly doubled.

The members of the family can be separated arbitrarily into two series, those having a keel below the periphery seen on the base, and those without. The latter are the true "*Scala*," and the others appear to be a somewhat heterogeneous association, probably with little real relationship. Many are practically smooth between the varices, while others are notably striate or lirate spirally. Generally it will be found that other shell features are available in connection with the above, and that an artificial system can be defined. Another item of interest is the tendency of some species to uncoil, as seen in the typical *Scala*, and curiously enough, the opposite tendency to become very tightly coiled is also strongly marked. The common coincidence of development on similar lines in different countries is well seen in this family, and therefore shell resemblance is of much less value than the factor of geographical distribution. The species appear to have a very restricted range as the tropical species are very easily separable from the temperate forms, even to group value.

#### Genus *Lamelliscala*.

1909. *Lamelliscala* Boury, Journ. de Conch., lvii, p. 258, September 12. Orthotype *Scalaria fasciata* Sowerby.

Shell small to medium, truly scaloid, whorls a little separate but touching, varices simple, few, intervals faintly marked but with no definite striation, not glossy. Lamellæ not rolled back and puckered as in the true species of *Scala*.

#### *Lamelliscala parspeciosa* Iredale.

(Plate xxii, fig. 1.)

1929. *Scala parspeciosa* Iredale, Austr. Zool. v, p. 345, plate xxxviii, fig. 14, March 24. Sydney Harbour.

Recently described as *Scala*, this species seems better placed under this genus, the lamellæ being recurved and thin edged, not puckered. The shell is comparatively broader, and the umbilical cavity wider.

Genus **Mazescala**, nov.

(Plate xxii, fig. 2.)

Type.—*Mazescala thrasys* sp. nov.

This genus is introduced for Scaloid shells with whorls tightly coiled and not umbilicated, lamellæ erect and numerous, apical whorls thin and glassy, whorls numerous, subshouldered.

**Mazescala thrasys**, sp. nov.

(Plate xxii, fig. 2.)

Shell small, thin, elongately awl-shaped, whorls slightly shouldered, rounded, sutures deep, mouth subcircular, coloration white. The apex consists of three and a half glossy subturbinate whorls, pale brownish, with a darker subsutural line. The adult shell is chalky white, ten whorls, the last whorl having twenty erect lamellæ which are peaked above the periphery, suggesting a shoulder, but shell itself rounded. The ribs are not continuous but almost always touching those on the preceding whorl; the interstices are practically smooth. Aperture oval, lips contingent, free, no umbilical chink.

Length, 15.5 mm.; breadth, 5.5 mm. Type from 70 fathoms off Green Cape. Habitat, New South Wales. On the continental shelf.

**Mazescala heloris**, sp. nov.

(Plate xxii, fig. 3.)

Shell small, broadly elongate, strongly sculptured with erect thin lamellæ, which seem to form a spiny shoulder. Coloration white, apex missing. Whorls seven, well rounded, sutures deep. Last whorl with fifteen stout varices, flattened below the suture, forming a pseudo-shoulder, then broadening into an erect spine, which stands out, and the varix succeeding is broader than preceding. The interstices are crossed by spiral lines, closely packed but showing under a strong lens a minute linear striation, the whole interstitial sculpture being very fine. Aperture roundly oval, quite free, lips contingent, strongly variced, no umbilicus but a strong rib formed in place of the fusion of the ribs basally.

Length, 13.5 mm.; breadth, 7 mm. Type from Sydney Harbour dredgings. Habitat, New South Wales.

**Mazescala bellicosa** Hedley.

(Plate xxii, fig. 4.)

This species was described by Hedley<sup>113</sup> from 800 fathoms East of Sydney, and other specimens were secured in 250 fathoms in the same neighbourhood. The shell is well described by Hedley, and the type is refigured as above. It is a smaller shell than the preceding, 7.5 x 3.25 mm., but has the same lamellæ, with the shoulder angulation, the interstices being smooth, the ribs between 16 to 20 on the last whorl; Hedley gives seventeen on the type.

<sup>113</sup> Hedley.—Rec. Austr. Mus., vi, 1907, p. 360, pl. lxxvii, fig. 18.

Genus *Laeviscala*.

1909. *Laeviscala* Boury, Journ. de Conch., lvii, p. 257, September 12. Orthotype  
*Scalaria subauriculata* Sowerbie.

1909. *Graciliscala* Boury, Journ. de Conch., lvii, p. 257, September 12. Orthotype  
*Scalaria gracilis* Sowerby.

Although called "Laevi" the interstices of the type are delicately spirally striate.

*Laeviscala tacita*, sp. nov.

(Plate xxii, fig. 5.)

This species has been commonly known as *Scala aculeata* Sowerby<sup>114</sup>, which was described from Hong Kong as "*laevi*," and in the Thesaurus<sup>115</sup> three species from different localities are figured under this name. In our collection three or more species were also found masquerading under this name, so the common Sydney shell is here described under the name *L. tacita*.

Shell elongate, thin, varices few, umbilicus none, the shell between the lamellæ delicately sculptured. Coloration white, not shining. Whorls eleven, varices eight in number, continuous, rolled back, not lamellar, fusing into a rib basally. Interstices finely striate, longitudinally crossed by rather distant spiral liræ, forming a microscopic reticulation. Mouth oval, lips just meeting to form a complete free aperture, the final varix normal.

Length, 25 mm.; breadth, 9 mm. Type from Sydney Harbour. Habitat, New South Wales.

*Acutiscala minima*, sp. nov.

(Plate xxii, fig. 6.)

This shell has been called *S. philippinarum* Sowerby<sup>116</sup>, a species described from the Philippine Islands, with the whorls separated and the shell coloured. Our species has the whorls closely adjoined and is pure white.

Shell elongate, thin, rather shining, few varices which are rather flattened and some at the suture are broadened and appressed to those of the preceding whorl. Apex missing, ten adult whorls, nine varices on last whorl, not forming a basal rib, the mouth oval, lips continuous, aperture complete. The facies of the shell is straight sided through the contiguous flattening of the varices.

Length, 24 mm.; breadth, 10 mm. Type from Sydney Harbour. Habitat, New South Wales.

The genus *Acutiscala* was introduced by Boury<sup>117</sup> with *S. philippinarum* Sowerby, as type, and is here used. The succeeding species has been called *S. jukesiana* Forbes, but while Forbes gave no locality the novelties were mostly Queensland shells, and his description and figure are not well applicable to the Sydney shell.

<sup>114</sup> Sowerby.—Proc. Zool. Soc. (Lond.), 1844, p. 12.

<sup>115</sup> Sowerby.—Thes. Conch., i, 1844, p. 86 bis., pl. 32, figs. 35-37.

<sup>116</sup> Sowerby.—Thes. Conch., i, 1844, p. 86 bis., pl. 32, figs. 1-3.

<sup>117</sup> Boury.—Journ de Conch., lvii, 1909, p. 257, 12 Sept.



***Acutiscala ampacta*, sp. nov.**

(Plate xxii, fig. 7.)

Shell small, elongate, narrow, many whorled, whorls rounded, sutures deep, closely lamellate, colour white. Apical whorls three, elongately turbinate, smooth, glossy, pale brown, adult whorls nine, adorned with about fifteen upright lamellæ, scarcely recurved, not continuous, and not forming a basal rib; the interstices are smooth and shining. Mouth oval, lips scarcely continuous, attached to body whorl, outer lip not strongly variced, no umbilicus.

Length, 13.5 mm.; breadth, 4.5 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

***Acutiscala fabia*, sp. nov.**

(Plate xxii, fig. 8.)

Shell small, awl shaped, many whorled, whorls rather flattened, sutures rather shallow, lamellæ close and continuous, colour white. Apical whorls missing, eight adult whorls remain, last whorl with twenty lamellæ continuous from whorl to whorl, interstices dull, faintly striate concentrically. Mouth oval, inner lip crossing as a glaze only to meet the outer lip. No umbilicus and no umbilical rib.

Length, 9 mm.; breadth, 4 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

***Acutiscala coreta*, sp. nov.**

(Plate xxii, fig. 9.)

Shell small, elongate, many whorled, whorls rounded, sutures deep, lamellæ few and rather distant, mouth free, no umbilical rib nor umbilicus. Colour white, apical whorls four, elate, turbinate, shining white. Adult whorls eight, adorned with distant upright lamellæ inclined to form a sub-shoulder through peaking above the periphery. Nine lamellæ on last whorl, last forming a strong varix, lips of mouth continuous, a little reflected sub-basally but not producing a basal rib; the interstices between the lamellæ are very faintly striate.

Length, 11 mm.; breadth, 4.5 mm.

*Habitat*.—New South Wales. Type from 70 fathoms off Green Cape.

***Acutiscala christyi*, sp. nov.**

(Plate xxii, fig. 10.)

Shell of medium size, rather broadly elongate, whorls rounded, not separate, lamellæ few and distant, mouth free. Coloration dull white, with brown band. Apex missing, nine adult whorls remain; the lamellæ on the last whorl numbering twelve, continuous, somewhat erect, then recurved and developing a little peak at the shoulder, but not sufficiently to make it a pseudo-shoulder. In between the lamellæ a fine sculpture of concentric liræ is developed, the intervals between which are finely regularly longitudinally striate. There is no basal rib, the mouth being free from the body whorl, oval, and notably varicose.

Length, 17 mm.; breadth, 8 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

Although this species is placed under *Acutiscala* it differs in the freedom of the whorling and the strong striation of the whorls, and therefore a new subgenus *Pudentiscala* is added for it alone.

**Limiscala helicornua**, sp. nov.

(Plate xxii, fig. 11.)

Shell small, elongately broadly oval, thin, varices numerous, whorls very rounded, mouth free, umbilicus present. Coloration pale horn, braided with brown. Apex missing, eight adult whorls sculptured with short ribs, which are flattened on the last whorl, interstices smooth and shining; the ribs are not continuous, and there is no basal chord present. The mouth is oval and free.

Length, 19 mm.; breadth, 9 mm. Type from Sydney Harbour dredgings.

This has been called *tenellum* Hutton, but that Neozelanic shell is smaller, and with fewer ribs and also narrower.

This is placed under the genus *Limiscala* founded by Boury<sup>118</sup> on the *Scalaria lyra* of Sowerby, which recalls the present species in general appearance, and the Queensland relative has been listed under Sowerby's name.

Genus **Obstopalia**, nov.

(Plate xxii, fig. 12.)

Type.—*Obstopalia lixa* sp. nov.

Shell elongate, small, awl-shaped, thin, varicose, longitudinals obsolescent, spiral grooves notable, mouth not complete, glassy white. Apex mamillate.

This shell was at first mistaken for *translucidum*, but does not now appear to belong to this family but rather to be related distantly to *Diffalaba*. The apex is of about one and a half whorls and glassy, the succeeding whorls rather flattened, but sutures impressed. Obscure longitudinal ribs forming varices, which are re-absorbed, disappear with growth, and spiral grooves develop as the shell increases; six or seven grooves on the penultimate whorl and continuing on the rounded base of the last whorl. The mouth is not complete, the outer lip thin, the columella a little twisted, quite imperforate.

Length, 12.5 mm.; breadth, 5 mm. Type from 70 fathoms off Green Cape.

*Habitat*.—New South Wales. On the Continental Shelf.

Genus **Solvaclathrus**, nov.

(Plate xxii, fig. 14.)

Type.—*Solvaclathrus jacobiscala* sp. nov.

Shell small, glassy, uncoiled, distantly ribbed, ribs lamellate, interstices smooth and shining, mouth subcircular, varicose. Apical whorls three, glassy, adult whorls seven, showing seven or eight distant lamellæ, the mouth presenting the last of these as a surrounding varix.

Length, 14 mm.; breadth, 8 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

<sup>118</sup> Boury.—Journ de Conch., lvii, 1909, p. 258, 12 Sept.

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Queensland shells are more elevated, more disjointed, and with fewer ribs, while New Caledonian specimens (probably *paucilobata* Boury) are larger, still more disjointed, and have only six ribs to the whorl. Sowerby's *hyalina*, under which this species has been placed, came from the Philippine Islands, and is much larger, with six *crenulate* varices, while *lavata* has simple but more numerous varices.

**Folaceiscala carchedon**, sp. nov.

(Plate xxii, fig. 13.)

Shell very small, thin, elongate, varicose as well as lamellate, interstices strongly concentrically lirate, non-umbilicate, mouth nearly free.

*Colour*.—Cream. Apical whorls missing, nine adult whorls showing erect lamellæ with a small peak below the suture, too high to form a shoulder, suggesting more a canaliculate suture, one or two varices present on each whorl. Twenty lamellæ, including three varices, may be counted on the last whorl, all discontinuous; the varices are irregular, from half to three quarters of a whorl apart. A dozen spiral liræ may be seen on the penultimate whorl. The mouth is oval, complete, varicose.

Length, 8.5 mm. : breadth, 3 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

The genus *Folaceiscala* was introduced by Boury<sup>119</sup>, with *S. dubia* Sowerby as type, and is here used for the species with the interstices spirally lirate, the whorls being well rounded.

**Folaceiscala barissa**, sp. nov.

(Plate xxii, fig. 15.)

Shell of medium size, elegantly awl-shaped, thin, closely finely lamellate; whorls, many, rounded, perforate, mouth barely complete and free. Colour, dirty white. Apex of three elongate glassy whorls, ten adult whorls, the sculpture of fine longitudinal lamellæ, the interstices crossed by numerous flat liræ. The last whorl shows thirty-five to forty lamellæ, which are of different strength, some fine, others large and recurved, while still others approach varices in size: about thirty concentric liræ appear on the last whorl and between these may be seen five longitudinal threads. The mouth is oval, and the inner lip reflected a little before it joins the outer to form a complete aperture. The umbilicus is narrow but distinct.

Length, 18 mm. : breadth, 8 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

The lamellæ in this shell are delicate and often get broken, but there appears to be another species with the lamellæ even more fragile and tending to obsolescence.

**Folaceiscala antisoa**, sp. nov.

(Plate xxii, fig. 16.)

Shell elongate, awl-shaped, thin, lamellæ short and distant, spiral liræ large and notable, mouth free, umbilicus present. Apical whorls missing, adult whorls nine, white and glassy, the lamellæ rather insignificant and far apart, sixteen on the

<sup>119</sup> Boury.—Journ de Conch., ix, 1912, p. 93, 15 Dec.

last whorl; below the suture is a smooth patch, then eleven flat liræ cross the penultimate whorl without any longitudinal striations; on the last whorl these concentric liræ also stop on the base, leaving the umbilicus smooth save for the longitudinals.

Mouth oval, regular, free, the outer lip almost variced by the last lamella.

Length, 19 mm. : breadth, 7.5 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

Contrary to the preceding species, this shell has strong and distant lamellæ, and the concentric liræ are also stronger and more pronounced.

### **Folaceiscala pindasa**, sp. nov.

(Plate xxii, fig. 17.)

Shell small, broadly awl-shaped, strongly lamellate, finely concentrically liræ, mouth complete, umbilicus closed by basal rib. Colour, white. Apex broken, apparently long, smooth and glassy, seven and a half adult whorls. Sculpture of stout lamellæ recurved and crenulated, peaked a little just below the suture, not continuous, but separate, basally running together into a stout rib, which closes the umbilicus. The spiral liræ are difficult to count (about nine on the penultimate whorl) as they have subordinate spiral threads between them. The mouth is roundly oval and complete, the last lamella forming a varix for the outer lip.

Length, 14 mm. : breadth, 7 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

This species shows so many differences, the closed umbilicus, the crenulated lamellæ, and the dense spiral sculpture, that a new subgenus *Crenuliscala* is here proposed for it.

### Genus **Narvaliscala**, nov.

(Plate xxii, fig. 18.)

Type.—*Narvaliscala dorysa* sp. nov.

Shell of medium size, elongate, acuminate, strongly variced, mouth almost circular, pronounced basal rib, imperforate. Sculpture of rounded longitudinal ribs overridden by a few threads with strong varices present. The apex is missing, fifteen whorls remain, each of which is completed by a varix. The last whorl, from varix to varix, shows twenty low rounded ribs overridden by six concentric threads, the base flattened, granulose, showing neither longitudinal ribs nor spiral threads. The varices are very large and round, and overridden by the spiral threads also, the mouth circular and attached to the base.

Length, 27 mm. : breadth, 7 mm. Type from 150–200 fathoms off Gabo Island.

*Caloscala* was proposed by Tate<sup>120</sup> for a fossil *Scala*, and its relatives may turn up in the deeper waters off the Coast, while Boury<sup>121</sup> introduced *Mammiscala* for a Muddy Creek shell, but the bulbous *striate* apex is a stumbling block at present.

<sup>120</sup> Tate.—Southern Science Record, 1885, p. 3. Orthotype, *Caloscala marie*, Tate.

<sup>121</sup> Boury.—Journ. de Conch., lvii, 1909, p. 255, 12 Sept. Orthotype, *S. ralphi* = *pachypleura*, Tate, non Conrad.

**Murdochella macrina**, sp. nov.

(Plate xxii, fig. 19.)

Shell minute, elongate, longitudinally wrinkle sculptured, apex stout, outer lip thin. Coloration dirty white.

Apex striate, apparently stopped by a varix, longitudinally ribbed, tip incurved : adult whorls with longitudinal wrinkles overriding a couple of concentric ridges, on the last whorl increasing to four, the lowest being a bounding rib encircling the base, which is flattened and a little excavate, smooth, save for growth striæ. There are seven and a half adult whorls, well rounded, sutures fairly deep, but no varices, the outer lip being thin and sharp, basally flattened by the basal cord; the columella is practically straight and almost forms a canal-like projection with the basal cord.

Length, 5 mm. : breadth, 1.25 mm. Type from 80 fathoms, 22 miles east of Narrabeen.

*Habitat*.—New South Wales. On the Continental Shelf.

The genus *Murdochella*<sup>122</sup> was introduced by Finlay for *Scala laevifoliata* Murdoch and Suter, a Neozelanic deepwater shell, with which the present shell was at the time confused, but subsequently Neozelanic species have been added, and probably some more Australian species occur. A doubtful member of this family.

Genus **Dissopalia**, nov.

(Plate xxii, fig. 20.)

Type.—*Scala turrisphari* Hedley.

Shell minute, elongate, whorls strongly shouldered, sutures very deep, mouth almost free, sculpture of longitudinal ribs, but apex non-Scaloid, being large, pupoid, rather bulbous at the tip and strongly spirally lirate. The apical features will probably determine the rejection of this genus from this family, but the subcircular mouth gives no clue to any other location at present. When Hedley<sup>123</sup> introduced this species he also gave a figure (fig. 19) of *Scala minutula* Tate and May, also with a sculptured apex. Cotton and Godfrey<sup>124</sup> have proposed a genus *Parascal* for this latter species (*minutula*), but Hedley had previously transferred it to the Rissoïdæ, under his genus *Attenuata*, based on his *Rissoa integella*, while I<sup>125</sup> had separated it generically even from that, naming it *Cænaculum*, and indicating that it was not referable to the family.

Genus **Plastiscala**, nov.

(Plate xxii, fig. 21.)

Type.—*Scala morchi* Angas.

Shell small, awl-shaped, solid, apex mamillate, sculpture weak longitudinal ribs and strong concentric liræ, varicose, mouth roundly oval, imperforate. Whorls eight and a half, plus one and a half smooth mamillate whorls, the adult sculpture showing about twenty rounded depressed longitudinal ribs overridden by stout cords, about six on the penultimate whorl extending on to the base on the last whorl, where there is an indistinct encircling basal cord.

<sup>122</sup> Finlay.—Trans. New Zeal. Inst., lvii, 1926-27, p. 402 (separate, 23 December, 1926. Volume, 10 March, 1927).

<sup>123</sup> Hedley.—Rec. Austr. Mus., vi, 1905, p. 52, fig. 18 in text.

<sup>124</sup> Cotton and Godfrey.—South Austr. Nat., xiii, 1931, p. 7.

<sup>125</sup> Iredale.—Proc. Linn. Soc. N.S.W., xlix, 1924, p. 244.

From 54–59 fathoms off Wattamolla, New South Wales, a larger, more slender shell with more rounded whorls was secured; the longitudinals are more sharply cut and the spiral cords are finer and more distinct; the basal cord is more definite and the basal liræ more crowded. This may be called *Platiscala morchi bentha* subsp. nov. (Plate xxii, fig. 23.)

From 250 fathoms 23 miles east of Sydney, a still more slender form was dredged, and in this case the sculpture is much weaker, the longitudinal ribs notably so, while the concentric cording is also much less defined and the varices more flattened. This form is here named *Platiscala morchi profundior* subsp. nov. (Plate xxii, fig. 22.)

#### Genus *Pomiscala*, nov.

(Plate xxii, fig. 24.)

Type.—*Scala perplicata* Iredale.

Shell of medium size, somewhat obese basally, nonumbilicate, columella reflected, mouth oval, not continuous, a faint basal cord overridden by longitudinal lamellæ, the lamellæ continuous from whorl to whorl, interstices practically smooth.

The type species was described<sup>126</sup>, as it had been known as *S. perplexa* Pease, a Hawaiian shell with a superficial facies. The shell, on account of the basal cord, falls into the "*Cirsotrema*" series, but in every other respect seems to belong to the "*Scala*" group. Overlooking that "essential" feature, I described a *Cirsotrema kelea*<sup>127</sup> from Queensland, without a basal cord, and this must now be removed to *Variscala Boury*<sup>128</sup>, which has for type, *Scalaria varicosta* Lamarck<sup>129</sup>, a closely related species.

#### Genus *Dannevigena*, nov.

(Plate xxii, fig. 25.)

Type.—*Dannevigena martyr* sp. nov.

Shell fairly large, subulate, sutures well impressed, non-umbilicate, strongly basally ridged, sculpture of wrinkled lamellose ribs, interstices striate.

The single specimen measures 38 mm. in length, and 15 mm. in breadth, and was taken by the "Endeavour" in 115–145 fathoms 55 miles south of Gabo Island, Bass Strait.

The apical whorls are missing, and 9½ adult whorls remain, the last whorl showing sixteen rather closely set ribs, each rib formed of fine lamellæ packed against each other and then recurved so that the rib is longitudinally closely frilled and the ribs appear broader than the interstices; at the base of the ribs the interstices are much broader than the ribs. The interstices are faintly concentrically striate. The base is flattened and the ribs flatten towards the aperture, forming a basal pseudo-rib in place of the umbilicus; the inner lip extends across to the outer, and completes the aperture, the outer lip being lamellately varicose by the presence of the last longitudinal rib. The mouth is roundly oval, almost subcircular.

<sup>126</sup> Iredale.—Austr. Zool., v, 1929, p. 344.

<sup>127</sup> Iredale.—Mem. Queenld. Mus., x, 1930, p. 87, pl. ix, fig. 16, 28 August: Michaelmas Cay, Q.

<sup>128</sup> Boury.—Journ. de Conch., lvii, 1902, p. 258, 12 September.

<sup>129</sup> Lamarck.—Hist. Anim. s. Vert., vi, (2), 1822, p. 228.

Genus **Opalia**.

1853. *Opalia* H. and A. Adams, Gen. Rec. Moll., i, p. 222, November. New name for *Clathrus* Gray, non Oken. Orthotype *Scalaria australis* Lamarck.

[1876. *Psychrosoma* Tapparone-Canefri, Journ. de Conch., xxiv, 154 (April 1). New name for *Opalia* Carpenter 1865, not H. and A. Adams 1858, has for haplotype, *Opalia bullata* Carpenter, and is not a synonym.]

Medium carinate Scaloid shells, turreted, rather straight whorls, imperforate, boldly distantly ribbed, ribs not continuous, mouth small, oval, base flattened, ten ribs to a whorl, interstices microscopically scratched.

**Opalia australis** Lamarck.

(Plate xxii, fig. 26.)

Described from the seas of New Holland, sent by Macleay; Port Jackson, New South Wales, may be selected as the restricted type locality.

Genus **Nodiscala**.

1889. *Nodiscala* Boury, Bull. Soc. Mal. Ital., xiv, p. 161. Orthotype, *Scalaria bicarinata* Sowerby.

Although Boury, at the place cited, was dealing with Italian fossils, he named as type of his new genus *Nodiscala*, the recent shell *Scalaria bicarinata* Sowerby. This shell is small, very solid, few whorled, the suture crenulated, the mouth very much thickened and the sculpture cancellate.

**Nodiscala apostolorum**, sp. nov.

(Plate xxii, fig. 27.)

Although Hedley ruled out the record of *Scala bicarinata*, the species thus named appears to be very close to the Philippine shell in generic features. Shell small, stout, whorls rather flattened, sutures not crenulate in this shell, the pseudo-crenulation being the junction of the longitudinal ribs with the preceding whorl, strong basal keel, mouth oval, surrounded by a large flattened varix, imperforate. The apex is stout and incurved, apparently smooth, half a whorl only, the succeeding whorls six in number, longitudinally ribbed, ribs rounded, flattened at the suture, and resting on the base of the rib of the preceding whorl, ribs numbering twelve, overridden by a fine threading throughout; on the last whorl above the basal keel another weaker rib encircles the shell above the periphery, making the last whorl imperfectly bicarinate. The mouth is oval, not separated from the body whorl, and with a broad flattened varix, showing the strong threading of the whorls.

Length, 7 mm.; breadth, 2 mm. Dredged off Ball's Head, Sydney Harbour.

*Habitat*.—New South Wales.

Genus **Rectacirsa**, nov.

(Plate xxii, fig. 28.)

Type.—*R. fregata* sp. nov.

Shell small, solid, few whorled, strong basal keel and stoutly varicose aperture. The apex consists of three and a half smooth whorls, elongate, stopped by a varix, and a little tilted; the succeeding whorls are six in number, sculptured with longitudinal ribs, the intervals finely concentrically striate; the ribs are separated, elevated, eleven on the last whorl but not continuing on the base. There are about ten concentric striæ on the last, again none on the base. The whorls are well rounded, the sutures deep, the ribs distant and sharply cut. The mouth is roundly oval, protected by a strong flattened varix and there is no umbilical chink.

Length, 4 mm.; breadth, 1.5 mm. Type from 250 fathoms off Sydney.

*Habitat*.—New South Wales. On the Continental Shelf in deeper water.

This was regarded by Hedley as *S. distincta* Smith, but see succeeding note. Hedley also included *S. translucida* Gatliff<sup>130</sup>, from off Narrabeen, in 80 fathoms, but the shell is too imperfect to describe, though it is certainly not Gatliff's species, which has been made the type of a new genus *Propescala* by Cotton and Godfrey<sup>131</sup>.

The inclusion in Hedley's Checklist of Marten's *unilaterale* was due to an error made by Boury in the reference cited by Hedley. In that place Boury inadvertently wrote "Sidney, 410 fath.," "Challenger," "Coll Tomlin," but on the next page he states that Tomlin's specimen came from Singapore.

Genus **Scalaria distincta** Smith.

(Plate xxii, fig. 29.)

This species was described by Smith<sup>132</sup> from some dredgings supposed to have been secured by the "Challenger" at Station 164B, somewhere off Sydney in 410 fathoms. At first Hedley suggested the total rejection of this "haul," as it proved to show a large number of deepwater Atlantic shells. Then some of the new species were recovered in shallower water about the same place and rehabilitated. This one was thus allowed to enter the authentic New South Wales list, but the specimens so determined do not agree at all well. Consequently, a copy of the original figure is here given for reference at a later date.

Genus **Granuliscala**.

1909. *Granuliscala* Boury, Journ. de Conch., lvii, p. 256, Sept. 12. Orthotype, *Scalaria granulosa* = *S. granosa* Quoy and Gaimard.

Shell medium, elongately conical, whorls a little flattened, longitudinal sculpture marked on early whorls, becoming obsolete on later, interstices minutely striate and roughened so as to appear granulose; whorls many, ribs eight to a whorl, mouth broadly oval, not complete nor varicose, inner lip reflected, forming a pseudo-canalicate basal lip with the outer lip.

<sup>130</sup> Gatliff.—Proc. Roy. Soc. Vict. (N.S.), xix, 1906, p. 2, pl. 1, figs. 3, 4.<sup>131</sup> Cotton and Godfrey.—South Austr. Nat., xiii, 1931, p. 7, 31 December.<sup>132</sup> Smith.—Proc. Zool. Soc. (Lond.), 1891, p. 441, pl. 35, fig. 15.



**Granuliscala ballinensis** Smith.

(Plate xxii, fig. 30.)

Smith<sup>133</sup> described this species from Ballina, northern New South Wales, and it is easily separated from the West Australian *granosa* Quoy and Gaimard.

The New South Wales members of the family Scalidæ will now read: *Lamelliscala parspeciosa* Iredale, *Mazescala thrasys* Iredale, *Mazescala heloris* Iredale, *Mazescala bellicosa* Hedley, *Laeviscala tacita* Iredale, *Acutiscala minoa* Iredale, *Acutiscala ampacta* Iredale, *Acutiscala fabia* Iredale, *Acutiscala coreta* Iredale, *Acutiscala (Pudentiscala) christyi* Iredale, *Limiscala helicornua* Iredale, *Obstopalia lixa* Iredale, *Solvaclathrus jacobiscala* Iredale, *Folaceiscala carchedon* Iredale, *Folaceiscala barissa* Iredale, *Folaceiscala antisoa* Iredale, *Folaceiscala (Crenuliscala) pindasa* Iredale, *Narvaliscala dorysa* Iredale, *Murdochella macrina* Iredale, *Dissopalnia turrisphari* Hedley, *Plastiscala morehi* Angas, *P. m. bentha* Iredale, *P. m. profundior* Iredale, *Pomiscala perplicata* Iredale, *Dannevigena martyr* Iredale, *Opalia australis* Lamareck, *Nodiscala apostolorum* Iredale, *Rectacirsa fregata* Iredale, *Scalaria distincta* Smith, *Granuliscala ballinensis* Smith. All are here figured on Plate xxii.

Family **CYMATIIDÆ**.

When I introduced the genus *Cymatona*, I<sup>134</sup> did not make any remark about the large nucleus, which was one of the outstanding features of the shell. Since then specimens have turned up showing this nucleus in a new light, and a figure is here given. It is somewhat globosely turbinate and has a notable hairy periostracum arranged in lines.

Many years ago Kesteven<sup>135</sup> studied the apices of the Australian members of this family, and I have been accumulating all the material possible dealing with this matter. Recently Finlay<sup>136</sup> devoted some time to this subject in connection with the Neozelanic species, and more recently Powell<sup>137</sup> has also contributed some ideas, but the family characters seem even more complex than these have concluded. Powell apparently accepts Finlay's diagnoses of the apical characters, but the first specimen picked up, *Charonia rubicunda* Perry, showed an apex disagreeing with Finlay's data "polished, white and shining, with no trace of horny envelope" as it was dull, pale red, and covered with a thin periostracum. However, upon investigating a series of *Austrosassia*, upon which Finlay based his work, I find that the "shining white apex" is covered at first with a thick hairy periostracum as in the apex of *Cymatona* here figured. This nullifies the whole of Finlay's separation, and, while the series he has indicated may be differentiated, general features of the apex cannot be utilized as absolute characters.

In 1929, I<sup>138</sup> listed the New South Wales members of the family, and placed under the genus *Cymatium* the following species, with the proviso that I would rearrange them later: *caudatum*, *exaratum*, *gemmatum*, *labiosum*, *australasia*, *sinense*, *waterhousei frigidulum*; *spengleri*, (*spengleri*) *procerum*, *boltenianum*, *pyrum*, *zimara* and *nicobaricum*. Using Dall's classification, we can place *pyrum* and *sinense* under *Ranularia*, *caudatum* under *Tritonocauda*, *nicobarica* under *Lampusia*, *australasia* under *Monoplex*, but the remaining ones do not fall under any of the named groups. The *spengleri* series has been located under *Cabestana* by Finlay and Powell, but they

<sup>133</sup> Smith.—Ann. Mag. Nat. Hist. (6), vii, 1891, p. 139.

<sup>134</sup> Iredale.—Rec. Austr. Mus., xvii, p. 177, 4 September, 1929.

<sup>135</sup> Kesteven.—Proc. Linn. Soc. N.S.W., xxvii, 1902, pp. 443-483, pl. xvii.

<sup>136</sup> Finlay.—Trans. New Zeal. Inst., lxii, 1931, p. 10.

<sup>137</sup> Powell.—Trans. New Zeal. Inst., lxiii, 1932, pp. 154-164, 28 February, 1933.

<sup>138</sup> Iredale.—Rec. Austr. Mus., xvii, 1929, p. 178.

are certainly not congeneric with the tropical type, *cutaceus* Linné, and the new genus *Cymatilesta* is here introduced, the type species being *spengleri* Perry. Many juveniles are before me, and the shell begins as a four-whorled turbinate horny envelope, adorned with rows of hairs as figured for *Cymatona*, but not so pronounced. A short canal with a thickened outer lip is present, and inside this horny envelope a shelly replica is formed, and as the shell itself follows, the horny outside wears off, leaving a shining, polished, white apex. The species *waterhousei* appears to have a similar protoconch; it has been found among the Harbour dredgings, and the form is still narrow like the deepwater *frigidulum*. Powell has named a New Zealand shell *C. waterhousei segregata*, classing with it the Kermadec shell, and also the Tasmanian one, a very unwise association. My series of Kermadec shells does not look at all like Powell's figure, being narrower and more like the New South Wales shells. Tasmanian shells are more like the typical *waterhousei*, the small specimen figured by Powell from South Australia being rather atypical.

The species *exaratum* is rather difficult to place, as it shows the long horn-covered apex, and is conchologically not unlike *cutaceus*, the type of *Cabestana*, but it is somewhat variable, and the forms lead away from that group, so that it will be better to differentiate it as *Cabestanimorpha* until the animals are closely studied.

Powell has figured a strange looking Neozelanic shell as *labiosum* Wood, separating it from *strangei*, the New South Wales form. Upon reinvestigating this matter I find that I was misled in accepting the British Museum locality of West Indies for *labiosum*, as Wood<sup>139</sup> figured it from Mrs. Mawe's Cabinet from an unknown locality, and the figure is very like the Sydney shell. However, that matter cannot be definitely settled here, so we may continue the undoubtedly correct name *strangei* for the local shell, but my Kermadec series is definitely not separable, with the few Sydney shells available. The small size, few varices, short, rather recurved canal, indicate the distinction of this little shell, but the apex is rather like that of *Bursa*, horny and variced and generally notably tilted. Thus it must be separated as *Particymatium*, gen. nov., the type being *strangei* Angas. Angas<sup>140</sup> recorded *Tritonium gemmatum* Reeve from Cape Banks, Botany Bay, and this species has not since been found in this locality although a similar shell is not uncommon in Queensland. Recently Mr. Ralph Blacket found a strange shell at Nielsen Park, near Watson's Bay, Port Jackson, and this is here figured, as it resembles *gemmatum* sufficiently to have been mistaken for it. As it is undoubtedly distinct it is here called *Septa ? blacketi* sp. nov. (Plate xxiii, fig. 3). The shell is rather small, but larger and broader than *S. rubecula*, with the ribs *not* nodulose. It is dead and faded, but is now creamy, and shows darker brown bands varied by white on the varix, as in *rubecula*. The mouth is a little more open, but otherwise the general facies links this species up with the tropical shell. The apical whorls are missing, but otherwise the shell is in good condition. Four adult whorls remain, with three varices on the last two whorls, the first two showing none. On the last whorl about eleven spiral cords encircle the whorl, the cords being flattened, and separated by wide interspaces, which are finely longitudinally striate; the preceding whorls show three cords. The varix is solid and broad, and is regularly strongly denticulate on its inner border. The inner lip is strongly wrinkled, exactly as in *S. rubecula*, and the canal is short and open.

Height, 40 mm.; breadth, 25 mm.

*Habitat*.—New South Wales.

This will allow the elimination of *gemmatum* Reeve from our list.

<sup>139</sup> Wood.—Suppl. Index Test., 1828, (preface, 17 May), p. 15, pl. 5, fig. 18.

<sup>140</sup> Angas.—Proc. Zool. Soc. (Lond.), 1877, p. 179.

In rearranging the species it will be better to call the small specimens of *waterhousei*, *C. waterhousei tepida* subsp. nov. as comparatively they are broader than the deepwater shell and have the spiral liræ more distant, and notably more nodulous on the periphery, about five strong nodules being counted between each varix. The type measures 43 mm. in height by 23 in breadth, and was picked out of the "Triton" dredgings by Mr. E. F. Nash.

Although the list of Cymatiid shells is becoming so large there appears to be still more, as among the *exaratum* series a thinner shell with a finer ornament, rounder whorls, and a somewhat different facies occurs, but its status is not yet determined.

A sufficient series of *sinensis* has now been accumulated to enable the separation of the "Triton" specimens as *R. sinensis defrenata* subsp. nov. (Plate xxiii, fig. 2) Our form is obviously broader, with a shorter spire and a shorter canal, the mouth being more open and the inner lip less strongly wrinkled.

Height, 63 mm.; breadth, 35 mm.

*Habitat.*—New South Wales. Type from Sydney Harbour.

In the case of *caudatum*, our local specimens differ in the same manner, being smaller, with more depressed spire, shorter canal and mouth more open and are here named *Tritonocauda caudata vulticula* subsp. nov. (Plate xxiii, fig. 1).

Height, 50 mm.; breadth, 28 mm.

*Habitat.*—New South Wales. Type from Sydney Harbour.

I<sup>141</sup> noted that *Charonia pumilio* Hedley had not turned up again, and that it might be the juvenile of a large form. Two more, collected many years ago by Brazier at the Black Rocks, Richmond River, are now before me, and agreeing exactly with the type, the species may be accepted as adult, but it cannot be classed under *Charonia*, the apex being of two (smooth) whorls, dome-shaped, and succeeded by longitudinal ribs, crossed by spiral liræ, entirely lacking the cancellation of the *rubicunda* juvenile. For the present it may be placed alongside *Charonia* under the new generic name, *Vernotriton*.

### ***Negyryna subdistorta* Lamarck.**

I<sup>142</sup> recently added this species to the New South Wales List by means of a specimen trawled off Montague Island, in 55–60 fathoms, and was therefore surprised to see it brought in by Mr. H. S. Mort from the Rose Bay spoil, deposited from the "Triton" dredgings. It was, however, astonishing to find it had been recorded from Port Jackson many years ago, and had been included in Whitelegge's List, but later written off as an unreliable record. Simultaneously with my proposal of *Negyryna*, Thiele<sup>143</sup> had introduced *Charoniella* for the same species, but later acknowledged that my name had a slight priority.

The species described by Hedley and May as *Septa petulans* was later transferred by May to *Eugyryna*, using that name for *subdistorta* Lamarck. Examination of the type suggests that the relationship may be with *subdistorta*, so that *petulans* may be included in the genus *Negyryna*; the apex is decollate and missing at a very early stage.

<sup>141</sup> Iredale.—Rec. Austr. Mus., xvii, 1929, p. 178.

<sup>142</sup> Iredale.—Rec. Austr. Mus., xvii, 1929, p. 177.

<sup>143</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 283; ii, 1931, p. 739.

Genus **Phanozesta**, nov.

(Plate xxiii, fig. 4.)

Type.—*P. remensa* sp. nov.

A genus of the Cymatiidae, recalling *Cymatona* at first sight, but this is a stouter shell with the outer lip lirate within; the apex is notably smaller, and is turbinate, of three and a half whorls, tip planate, not variced, outer edge straight, covered with a fine glossy horny periostracum with raised longitudinal lines, becoming more crowded towards the aperture and crossed by a couple of concentric similar raised lines (Plate xxiv, fig. 5). This appears to be an essential difference in apical features, as Dall records the *Cymatona* style from very different shells. Adult whorls five and a half, consisting of many concentric ridges and threads overridden by a few longitudinal ribs, causing sharp nodulation and multitudinous fine longitudinal threads, making a very fine reticulation. About twelve concentric ridges, with half a dozen threads between each ornament on the last whorl, the longitudinal nodules being about eight. The canal is a little lengthened, and recurved slightly, and the outer lip is fortified by a strong varix, similar varices preceding this about every three-quarters of a whorl, the outer lip with six or seven strong denticles within.

Length, 28 mm.; breadth, 14 mm. Type from 110 fathoms east of Sydney.

*Habitat*.—New South Wales, on the deeper edge of the Continental ShelfGenus **Apollon**.

As still another species was picked out of the "Triton" dredgings the opportunity is taken of fixing the name of the species hitherto regarded as *pusilla*. The generic name was shown to be *Apollon*<sup>144</sup>, a subgeneric name, if necessary, being *Gyrinella*. It is now possible that the latter will come into use, as two closely allied species are living in Queensland, hitherto classed as *pusilla*. Mr. Melbourne Ward sent me down some shells picked out of a dredging made in 8 fathoms off Lindeman Island, and there were obviously two species. Upon re-examination of the material already in the Museum, the two were easily differentiated. My colleague, Mr. G. P. Whitley brought back some shells from Rarotonga, and among them was "*pusilla*," certainly distinct from the Australian shells and like the typical "*pusilla*" from Lord Hood's Island.

Tryon<sup>145</sup> lumped under the name *pusilla* the species *concinna* Dunker, *rosea* Reeve, and *polychloros* Tapp-Canefri. Probably many species will now be allowed, as these named seem easily distinguishable. The shell most like "*pusilla*" is here named *facetus*, and the one confused is named *deliberatus*. The larger *gyrinus* is very like *facetus*, but has larger nodulation and strikingly different coloration.

**Apollon facetus**, sp. nov.

(Plate xxiv, fig. 3.)

Shell small, broad, laterally a little compressed and apparently twisted, the varices continuous along each side running slightly backwards. The dead Sydney shell has the earlier whorls brownish, the later ones bleached white. The apical whorls are about two and a half, smooth, turbinate, but not variced, the succeeding whorls, five and a half in number, are sculptured by means of strong concentric cords which become nodulous through the intersection of longitudinal rounded ribs. As

<sup>144</sup> Iredale.—Rec. Austr. Mus., xviii, p. 213, 29 June, 1931.<sup>145</sup> Tryon.—Man. Conch., iii, p. 44, 31 December, 1880.

there is a varix each half whorl, the ribs can be easily counted; on the first there are six cutting three cords, and on the last half whorl, ten distinct cords are seen, with spiral threads between, and these are noduled by nine longitudinal ribs, giving a fine reticulate effect. The external varix is well spread out, broad and flattened, showing the ten cords and intermediate threading clearly; the outer lip itself projects a little from the internal edge of the varix, and in the interior are denticulations corresponding to the intervals between the external cords. The inner lip is only slightly shown as a glaze, but on the anterior portion of the columella there are some nodules. The canal is moderately short and narrow.

Height, 19 mm.; breadth, 14 mm. Type from Sydney Harbour.

*Habitat*.—New South Wales, Queensland.

### **Apollon deliberatus, sp. nov.**

(Plate xxiv, fig. 4.)

Shell similar to the preceding, but it apparently grows to a larger size, and is easily distinguished by the obsolescence of the reticulate sculpture on the last whorl, which is accompanied by a slight distortion of the body whorl, the varix especially showing the vanishing of the cording.

Coloration of living shell apparently uniform brown, the mouth being a beautiful rose. The early whorls seem very like those of the preceding, but the varices appear to be more closely welded to one another, the nodulation less pronounced, and the sutures not so deep. About the fourth whorl the sculpture becomes definitely weaker, and the last one shows an upward swelling crowding the suture and a depressing basally. By this growth the reticulation is eliminated, and only the concentric threads remain on the upper part of the whorl, a weaker cancellation still persists on the lower part, but even this tends to disappear. The varix encroaches on the preceding higher one and also loses its cording, a longitudinal threading taking its place on the upper half. The upstanding outer edge of the lip inside the varix has about eight denticles. The inner lip is well reflected over the columella and extends in a glaze across the body whorl to the outer lip. Canal rather short and very narrow.

Height, 19 mm.; breadth, 14 mm. Larger specimen 25 mm. x 16 mm.

*Habitat*.—Queensland. Dredged off Lindeman Island, Whitsunday Passage, in about 8 fathoms, associated with the preceding species.

These species, though resembling the "Ranellid" shells, are more closely related to the Cymatiid forms and enter the family Cymatiidae, not the Bursidae.

### **Annaperenna verrucosa Sowerby.**

Captain Comtesse brought in some shells for examination and among them was a small immature shell which, he explained, he had almost thrown away as valueless. It was one of the most interesting (to me) of the very many valuable finds he has made.

At the Kermadecs I collected a very striking shell, which became one of the gems of the collection, as it was recognised as a species named some eighty years previously and not rediscovered in the meanwhile. In my record I<sup>146</sup> used the name *Argobuccinum papilla* Wood, but the supposed synonym *verrucosa* Sowerby is now

<sup>146</sup> Iredale.—Proc. Mal. Soc. (Lond.), ix, p. 73, March, 1910.

known to have been published earlier than Wood's name. The generic location was quite incorrect, but the species does not fall easily either into *Bursa* or *Trutufa*, so the new generic name *Annaperenna* is proposed for *Ranella verrucosa* Sowerby<sup>147</sup>.

This is one of the most striking of shells, with a very restricted and curious distribution as far as yet known. Described from unknown locality in 1825, it was not again met with until I secured specimens in 1908 at the Kermadecs. Then Roy Bell, who had collected it at the Kermadecs, found specimens at Lord Howe Island and at Norfolk Island, and now I record it from the Sydney Harbour dredgings. The logical conclusion is that the original specimen came from Norfolk Island.

While the appearance is very distinct, the details recall those of *Lampasopsis*, but it has a very short anal gutter placed in front of the heavy varix, and thus almost obliterated on the earlier whorls, whereas in *Lampasopsis* the gutter is always prominent. The columella is strongly wrinkled and a very strongly developed inner lip is also wrinkled with colored lines.

#### Family NATICIDAE.

The Naticoid shells included under the genus *Natica* from New South Wales by Hedley read: *N. alapapilionis* Bolten, *N. euzona* Recluz, *N. gualteriana* Recluz, *N. sagittata* Menke and *N. subcostata* Ten-Woods. He rejected *collei* recorded by Angas, and replaced Angas' *areolata* by *euzona*.

I<sup>148</sup> added *N. shorehami* Prit. and Gatliff and noted that the opercular characters "shelly, smooth, with an obscure marginal sulcus"—would place it in *Cochlis* Bolten, with type *albula* Bolten, the typical *Natica* having a completely sulcate operculum.

So far as can be worked out here, the traditional type of *Natica* has now been altered to *vitellus*, which is said to have a similar smooth operculum, and *Naticarius* Dumeril has been utilized for the series with the operculum strongly sulcate. On account of the similarity of shell appearance, most workers have become perplexed as to the treatment of this family.

*N. alapapilionis* Bolten has a very thick irregularly coarsely sulcate operculum, and from shell features may be classed under *Naticarius*, but the little *N. subcostata* Tenison-Woods has a regularly sulcate operculum, and the umbilical features with the small entering funicle separate it, so it may be regarded as a subgenus, *Quantonatica*.

Powell<sup>149</sup> has distinguished the Neozelanic "*gualteriana*" as *migratoria*, and included thereunder the New South Wales shells so-called, but Finlay<sup>150</sup> has separated the latter as *vafer*, the type being from Shellharbour. Powell<sup>151</sup> has rejected this dissociation, and introduced the new genus *Notocochlis* for his own species.

There are many specimens available from Queensland, and while the operculum shows only one marginal ridge as figured by Powell, its nucleus shows more definite coiling.

The two names on Hedley's List, *euzona* Recluz and *sagittata* Menke, refer to the same thing, and neither are applicable, the former being given to a Philippine Island

<sup>147</sup> Sowerby.—Cat. Shells Tankerville Coll., Jan., 1825, App. p. xviii.

<sup>148</sup> Iredale.—Proc. Linn. Soc. N.S.W., xlix, 1924, p. 254.

<sup>149</sup> Powell.—Trans. New Zeal. Inst., lvii, 1927, p. 560.

<sup>150</sup> Finlay.—Trans. New Zeal. Inst. lxi, 1930, p. 232.

<sup>151</sup> Powell.—Trans. New Zeal. Inst., lxiii, 1933, p. 166, figs. 16, 17, 22.

species, whose types I have examined, and the latter is a West Australian shell, so the local shell is here described as

**Notocochlis cothurnata**, sp. nov.

(Plate xxiv, fig. 6.)

Shell subglobose, thin, spire a little exsert, shining, aperture semilunar, small umbilical funicle, umbilicus almost hidden, operculum shelly.

*Coloration*.—Below the suture is a row of brown dots succeeded by wavy lines, which develop strong thickened curved apices with thin shallow intervals, the base surrounded by a series of brown spots, the ground colour being white. The apical whorl is small, smooth, planate, not differentiated from the succeeding four to five adult whorls, which are smooth, with only the finest of growth striæ.

Height, 15 mm.; breadth, 14 mm.

*Habitat*.—New South Wales. Type from Kurnell, Botany Bay.

This species may be later found to be referable to *Tanea* introduced by Marwick<sup>152</sup> for the Neozelanic *zelandica* Quoy and Gaimard, but its radula must be examined first, especially as the local species has been confused with species from the Philippine Islands, which are scarcely likely to be congeneric with the Neozelanic shells. The operculum of the Sydney species is very thin, shelly, smooth, with two marginal sulcations enclosing a raised rib.

**Notocochlis schoutanica diatheca**, subsp. nov.

(Plate xxiv, fig. 7.)

From a trawling in 45 fathoms off Crowdy Head, north of Port Stephens, New South Wales, Mr. Dingeldei brought in some small shells picked off the trawl lines by Captain Moller. These were very similar to specimens from the extreme south, though a little Naticoid recalled a northern tropical shell, but upon critical examination it turned out to be a form of *Natica schoutanica* May<sup>153</sup>, described from 40 fathoms, off Schouten Island, south Tasmania, a distance of over one thousand miles in a straight line. The operculum is still unknown, but as the generic name *Natica* is unavailable, it is placed under *Notocochlis* until more details are secured. May compared it with the Neozelanic *N. australis* Hutton, for which Powell<sup>154</sup> introduced the genus *Proxiuber*. Our specimens do not agree absolutely with typical *schoutanica* in the formation of the umbilical funicle, and the strong spiral grooving of the umbilicus so are differentiated as above.

**Mammilla plumatilis**, sp. nov.

(Plate xxiii, fig. 18.)

I<sup>155</sup> described *M. propesimiae* from the Sydney Harbour dredgings, and, much later, looking through a series collected by Mr. E. F. Nash I detected the very beautiful shell now named.

Shell globose, spire very short, aperture very large, thin, finely sculptured.

*Coloration*.—White, with two interrupted brown bands, columella pale flesh-coloured.

<sup>152</sup> Marwick.—Trans. New Zeal. Geol. Survey, Pal. Bull. 13, 1931, p. 98.

<sup>153</sup> May.—Proc. Roy. Soc. Tasm., 1912, p. 45, pl. 2, fig. 3.

<sup>154</sup> Powell.—Trans. New Zeal. Inst., lxxiii, 1933, p. 167.

<sup>155</sup> Iredale.—Austr. Zool., v, 1929, p. 341, pl. xxxviii, fig. 5.

The apical whorls are small and shining, then the succeeding four and a half crossed by fine wavy concentric ridges with radial growth lines reticulating them very delicately. The umbilicus is narrow and deep, an indistinct ridge outlining the umbilical area. The columella is fairly straight and a little reflected, only a faint glaze connecting it with the outer lip.

Height, 35 mm.; breadth, 30 mm. Type from Sydney Harbour.

*Habitat*.—New South Wales.

An immature shell, apparently of the same species, had been previously collected by Captain Comtesse, who had regarded it as distinct, but it seemed too young to describe.

### **Marseniopsis innominatus**, sp. nov.

(Plate xxiv, fig. 8.)

As No. 705 in Hedley's Check list was included "*Marseniopsis* sp., *Lamellaria indica*, Angas, Proc. Zool. Soc., 1867, p. 199." Although the animal has not yet been recovered, shells are not uncommon, so that it is necessary to give a name to the species for reference, and it is here named *Marseniopsis innominatus* sp. nov.

Shell small, thin, glassy, white, of two whorls, the second very rapidly increasing and descending, the general facies being loosely naticoid. The glossy surface shows no sculpture.

Height, 7 mm.; breadth, 7 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

### **Volva volva cumulata** Iredale.

(Plate xxiii, fig. 8.)

This shell was named<sup>156</sup>, but no figure given, so the above will show the differential characters of the southern form. Comparison with numerous specimens from northern localities show that the local shells are all consistently broader and generally smoother, and striæ, when showing, are weaker and more crowded.

Length, 95 mm.; breadth, 31 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

Queensland specimens have a breadth of 23–25 mm., and other Pacific Island shells are similarly narrow.

### **Diminovula manifesta**, sp. nov.

(Plate xxiv, fig. 10.)

The type of *Diminovula verepunctata* Iredale<sup>157</sup> was from Caloundra, Queensland, and a living shell brought in from 55–60 fathoms 10 miles east of Sydney showed the same coloration and form. Upon comparison the local shell was found to be smooth, as well as smaller and narrower. Shell narrowly ovate, surface shining, thin, outer lip denticulate all its length; inner lip quite smooth, a nodule at the posterior (apex)

<sup>156</sup> Iredale.—Rec. Austr. Mus., xviii, 1931, p. 222.

<sup>157</sup> Iredale.—Mem. Queensl'd. Mus., x, 1930, p. 85.



end, and a rather prominent columellar tooth in front of the short canal. Coloration glassy white, with three rows of brown blotches, the ends each being marked with brown, the outer lip medially unmarked. There are about thirty crenulations on the outer lip, which is a little variced, and the denticulations cross this pseudovarix.

Length, 9 mm.; breadth, 5.5 mm.

*Habitat*.—New South Wales. On the Continental Shelf.

Genus **Relegamoria**, nov.

(Plate xxiii, fig. 10.)

Type.—*R. molleri* sp. nov.

Captain Moller brought in a very fine Volute trawled off Manly, New South Wales, in about 85 fathoms.

It is of medium size, 76 mm. long by 33 mm. wide, and the back view presents a beautiful golden brown shining surface, the penultimate and antepenultimate showing a slight white overlying glaze, the apical whorls being four and clear brown in colour. The last two whorls show clearly a pale orange zone followed by a darker brown below the suture. There is a faint lining reminiscent of the marking of *undulata*, but not the same. The whole of the front surface, excepting the apical four whorls, is covered with a thin white glaze, the interior of the mouth also showing the glaze. The four columellar plaits are thickened, and the posterior two show a large double tooth as well. The apical whorls distinguish this species from *Amorena*, and also from *Amoria*, though it seems nearer the latter tropical genus than the former, the local genus of southern Australia.

Genus **Ancillista**, nov.

Type.—*A. velesiana* sp. nov.

A genus of the Ancillidæ of fairly large size, thin texture, open mouth, little enamelling on suture, spire elate, shorter than the aperture, basal canal wide.

**Ancillista velesiana**, sp. nov.

(Plate xxiii, fig. 9.)

Shell large, thin, elongate oval, spire a little acuminate, shorter than the body-whorl, whorls convex, sutures distinctly marked, last whorl swollen. Whorls six, apex almost planate, outer lip thin.

*Coloration*.—Initial whorls shining white, the third showing a creamy tinge, darkening into a beautiful golden brown glaze, which vanishes a little in front of the aperture, the last three-quarters of the whorl being non-shining pale yellowish brown. As the glaze practically covers the preceding whorls the real coloration can be seen only on the last whorl; below the suture is a broad white band, and round the base is a deep brown band, succeeded anteriorly by a paler band, the columella itself being white. A delicate striation of growth lines is crossed by an indistinct spiral scratching, seen only on the last whorl, the glaze obliterating it previously. A raised thread runs just above the suture and a slight ridge bounds the basal brown band.

Length, 71 mm.; breadth, 32 mm.; length of spire, 21 mm.

*Habitat*.—Northern New South Wales. Type dredged off Cape Hawke, in 45-50 fathoms.

This species occurs in Hedley's list as *Ancilla cingulata* Sowerby, a species described from Cape York, North Queensland. The local shell had been separated as long ago as 1864 under the name *A. angasi* by Cox, who, however, never published any description, and the name was sunk as an absolute synonym of the northern form.

The species here described is consistently broader, and the Queensland shell, which measures 72 mm. by 30 mm., with a spire length of 24 mm., has a second broad brown band above the deep brown one seen in the southern species, and this is followed by a sharp ridge, which is missing in the latter case.

### Family COLUMBARIIDAE.

This family, proposed by Tomlin, can be accepted, and may be placed near the *Fusinidae*, but there are many more species than have yet been described. The genus *Columbarium* was introduced by Martens<sup>158</sup> for a species collected by the "Gazelle," off Moreton Bay, 76 Faden. Through a curious error it was placed in the genus *Pleurotoma*, being named *P. spinicincta*, and figured on plate 21, fig. 1-3.

A few months later Watson<sup>159</sup> described another species from off Sydney, New South Wales, in 410 fathoms, but he placed it in the genus *Fusus*, calling it *F. pagodoides*, and remarking that Tenison-Woods<sup>160</sup> had used the same name for a fossil, but without description, and that this might even be the same species. Although Watson pointed out the differences between his species and that described by Martens, these have been incorrectly synonymized by some later workers.

Captain K. Moller brought in from 85 fathoms off Manly a broken shell, and as this seemed different he looked out for more, and half a dozen more or less broken specimens have been secured from 70-110 fathoms off Sydney.

Hedley had dredged two good specimens from 250 fathoms 23 miles east of Sydney, and these proved to differ not only from Captain Moller's shells, but also from "Challenger," specimens from the 410 fathom depth. Consequently, four species can easily be distinguished as follows:—

*spinicinctum* Martens.—Spinose and prickly, quite unlike the southern shells.

*pagodoides* Watson, 410 fathoms.—Peripheral flange entire, upturned, three ridges below periphery.

*hedleyi* nov., 250 fathoms.—Peripheral flange strongly toothed, shell thin, two ridges below periphery.

*trabeatum* nov., 70-110 fathoms.—Peripheral flange weakly toothed, shell stout, three or more post-peripheral ridges.

The latter two are more fully described below, but it may be mentioned that there are many species belonging to this family from the fossil beds of Victoria, Tasmania, and South Australia, but the ones already described do not appear to be comparable with the recent ones above noted, and careful work may reveal some more closely related forms.

<sup>158</sup> Martens.—Conch. Mitth., ii, p. 105, December, 1881.

<sup>159</sup> Watson.—Journ. Linn. Soc. (Lond.), Zool., xvi, p. 383, 12 June, 1882.

<sup>160</sup> Tenison-Woods.—Proc. Roy. Soc. N.S.W., xi, 1877, p. 72, 1878, ex McCoy M.S. *nom. nud.*

**Columbarium hedleyi**, sp. nov.

(Plate xxiv, figs. 18, 18a.)

Shell comparatively large for this family, thin, spire moderately elevated, canal very long. Coloration of dead shell, dirty white. The nucleus is about a whorl, very swollen and not differentiated from the succeeding adult whorls. The type has five adult whorls, and is 51 mm. long, but a broken specimen has the canal alone as long. The sculpture begins as a peripheral keel, which almost immediately develops a toothed flange, the teeth being larger and more prominent as the shell increases, the last whorl showing long, flattened, hollow, tube-like processes, recalling the tubes of the Typhinid Murices. The steep shoulder above the periphery is marked only with growth lines, but the base below is adorned with two parallel ridges of very fine prickles, the canal showing similar very obscure prickling becoming obsolete very quickly. The canal is tortuous and narrow. The outer lip is thin, the inner lip reflected as a thick upright glaze.

Length, 51 mm.; breadth, 24 mm. Type from 250 fathoms 23 miles east of Sydney, New South Wales.

**Columbarium trabeatum**, sp. nov.

(Plate xxiii, fig. 17.)

Differs from the preceding in a few details, but generally the shells are much alike. Coloration, pale to dark brown, uniformly coloured. Peripheral girdle less strongly toothed, but below the periphery at least four strong rows of minute prickles succeeded on the canal by similar series of prickles, which become obsolete towards the end. The type is 60 mm. long and 27 mm. wide. In one specimen with the canal broken, the dark coloration of the shell shows white growth lines, and the peripheral teeth are all whitish; below, the prickly rows are close together, and the shell is stouter, as if it might have come out of shallower water, perhaps the 70 fathom line. Another one with the canal broken right off is very pale and has only three very distinct rows of prickles approaching the deeper water form, and has the inner lip so developed that the mouth has become free.

*Habitat*.—New South Wales. Deeper water of the Continental Shelf. Type from 110 fathoms east of Sydney, New South Wales.

**Colus genticus**, sp. nov.

(Plate xxiii, fig. 5.)

When naming *Colus sinovellus* I stated, "It did not agree with the species known as *turrispictus* Martyn, which was included in Hedley's Check List, nor with specimens so determined from northern New South Wales." Mr. W. L. Dingeldei has since brought in from the Dundas dump a specimen of the *turrispictus* group, quite like Martyn's figure, but Martyn's name is unacceptable and our shell is more nodulose. Shell large, white (dead), elongately fusiform, spire long, canal long. Apex missing, but six adult whorls remain, each notably keeled at the periphery. On the last whorl the keel is formed of fourteen angulate nodules, thirteen on the preceding one, twelve on the antepenultimate, and so on. The spiral liræ which dominate the shell vary in strength and number, about eighteen appearing on the shoulder of the last whorl,

of which six are large, the rest smaller. Below the periphery on the body whorl about nine large and many smaller ones occur, the whole being crossed by fine radials, which do not decussate the spirals, but are subordinate to them.

Length, 111 mm.; breadth, 39 mm.

**Fractolatirus**, gen. nov.

Type.—*F. normalis* sp. nov.

A curious little shell was included in the New South Wales list by Hedley in the family Fasciolaridae under the name *Latirofuscus spiceri* Ten.-Woods, of which *L. nigrofuscus* Tate was treated as a synonym.

Tenison-Woods<sup>161</sup> described this species from King Island as *Fusus spenceri*, and Tate<sup>162</sup> had introduced his *Latirofuscus nigrofuscus* from Edithburgh, South Australia, making use of a genus proposed by Cossmann<sup>163</sup> for a Parisian Eocene fossil. However, when Cossmann<sup>164</sup> wrote his great work, and figured his type species, he sank his own name *Latirofuscus* in favour of *Dolicholatyrus* Bellardi 1883. The figure shows a shell quite unlike ours in form, apertural characters and sculpture, and ours may be diagnosed: Shell elongately fusiform, spire longer than aperture, canal moderately long, columella two plicate, outer lip lirate within, sculpture of longitudinal broad ribs.

**Fractolatirus normalis**, sp. nov.

(Plate xxiv, fig. 19.)

Shell small, elongate fusiform, spire attenuate, canal long, but apertural length less than that of spire, columella with two plaits, outer lip thick, lirate within. Coloration, uniform brown.

The apex is worn, but seven adult whorls remain; the sculpture consists of longitudinal ribs, which are comparatively few in number, broad and rounded, and these are crossed by fine concentric ridges separated by intervals of two or three times the thickness of the ridges. On the penultimate whorl about fifteen ridges can be counted, and nine longitudinal ribs. On the last whorl the ribs are about the same number, showing, however, strong growth stages between. The aperture is narrow, the outer lip showing about eight long liræ inside, the canal moderately long, straight and narrow. The columella has two somewhat indistinct plaits, and the inner lip is shown as a thick glaze passing to the outer lip, where there appears on the body whorl a slight nodule.

Length, 26 mm.; breadth, 9 mm.; length of aperture, 12 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour.

**Benthindsia**, gen. nov.

Type.—*B. problematica* sp. nov.

A deepwater genus recalling *Hindsia* of the tropics, but lacking the lateral compression and much recurved canal.

<sup>161</sup> Tenison-Woods.—Papers Proc. Roy. Soc. Tasm., 1875, p. 137, 21 March, 1876.

<sup>162</sup> Tate.—Proc. Roy. Soc. South Austr., xiv, p. 258, pl. xi, fig. 3, December, 1891.

<sup>163</sup> Cossmann.—Annales Soc. Roy. Malac. Belg., xxiv, p. 175, 1889.

<sup>164</sup> Cossmann.—Essais Paleconch. comp., livr. iv, p. 22, pl. 1, fig. 5, October, 1901.

**Benthindsia problematica**, sp. nov.

(Plate xxiii, fig. 7.)

Shell broadly fusiform with a long spire, open mouth and short canal, sculpture of longitudinal ribs and spiral cords, mouth variced. Coloration, uniform brown.

Whorls eight, apical one and a half, smooth, small, adult sculpture appearing at once; the last whorl shows nine longitudinal, distant, rounded ribs, the preceding one the same number or one more, and the antepenultimate ten or eleven; the sutures are rather deeply impressed. The longitudinal ribs are overridden by spiral cords of varying strength, the larger ones crossing the ribs making a sub-nodulation. The last rib forms a strong varix, the aperture being smooth internally. The inner lip reflected as a strong glazed pillar.

Length, 28 mm.; breadth, 15 mm. Type from 110 fathoms off Sydney, New South Wales.

*Habitat*.—New South Wales.

**Sydaphera obnixa**, sp. nov.

(Plate xxiii, fig. 6.)

Apparently the variation in this group is geographically recognisable at sight, as specimens from northern New South Wales are separable at a glance, being less shouldered and more closely ribbed.

Shell of medium size, spire elevated, about as long as the aperture, mouth fairly open, quite imperforate, shoulder rounded.

Coloration fawnish with red brown bands, a subsutural one most notable. The apex is, as usual, smooth, tumid, a little planate, five adult whorls ornamented by longitudinal ribs crossed by irregular cords, the ribs becoming more distant on the last whorl. About eighteen are there seen, while on the previous whorl at least twenty can be counted, all much more flattened than in the southern shell. The cording is variable in strength, a dozen showing on the penultimate whorl, all finely longitudinally striated. The mouth is lirate within, and the columella three-plaited.

Height, 26 mm.; breadth, 16 mm.

*Habitat*.—Northern New South Wales. Type from the Richmond River beach.

Genus **Arizelostoma**, nov.

(Plate xxiv, fig. 9.)

Type.—*A. laseroni* sp. nov.

Ten years ago I saw this generic type in the collection of the late Mr. G. MacAndrew, of Shellharbour, New South Wales, but was unable to get the specimen. Mr. C. F. Laseron, who was interested in the Mollusca some years ago, has again taken up the group with his son John, and visiting Shellharbour was fortunate in finding the specimen now described. It belongs to the *Trigonostoma* series, but is rather unlike the tropical type of that genus, and is easily separated by the columella having only two plaits, the true *Trigonostoma* having three. There is a genus *Ventrihia* Jousseaume<sup>165</sup> which, according to Thiele, is similar with only two plaits, but otherwise is American, and quite unlike the present species, hereafter described.

<sup>165</sup> Jousseaume.—Le Naturaliste, ix, 1887, pp. 164-194.

Shell short and broad, spire not much elevated, with very deeply excavate shoulder and wide open umbilicus, columella two-plaited.

Coloration of dead shell, dirty white. Apical whorl, one, tumid, succeeding whorl three. Sculpture of distant rounded longitudinal ribs which crenulate the shoulder; this excavate shoulder shows only growth lines, while the body whorl is encircled by five major cords, and about twenty minor ones. The umbilical cavity penetrates funnelwise to the apex, and is bounded basally by a thickened rib. The columella is almost perpendicular, with two transverse plaits, the aperture practically free and trigonal in shape, and the outer lip thin.

Height, 7 mm.; breadth, 7 mm.

*Habitat*.—New South Wales. Type from Shellharbour.

Consideration of the species described as *Trigonostoma vinnulum*<sup>166</sup> necessitates its transference from the genus *Trigonostoma* (Tautotype, *T. trigonostoma*), differing in its more compact form, less triangular mouth, which is not free and the minute perforation; these contrast greatly, and demand the new generic term, *Trigonaphera*.

It may also be noted that Jousseaume<sup>167</sup> provided a generic name for the South Australian Cancellarid *spirata* Lamarck, introducing *Nevia* for the species *C. excavata* Sowerby, an absolute synonym of Lamarck's shell.

#### **Benthofascis**, gen. nov.

Type.—*Bathytoma biconica* Hedley.

When I<sup>168</sup> reinstated *Teleocheilus* in its correct application I promised emendation of its misuse in connection with *Bathytoma sarcinula* Hedley and *B. biconica* Hedley. Recent acquisitions from the trawlers have indicated that these two names refer to the same species, though it is possible that they may serve for geographical races. Hedley first described these species as *Bathytoma*, then he transferred them to *Teleocheilus*, and Gatliff and Gabriel relegated them to *Conorbis*. It may be here remarked that *Teleocheilus* is altogether missing from Thiele's Handb. syst. Weicht. so that we cannot record his opinion.

Shell biconical, the apertural length a little longer than that of the spire, the apex small, planate, the tip almost incurved and smooth, but spiral ridges begin almost at once, continuing as the adult sculpture. The aperture is long and narrow, the columella a little twisted, the outer lip with a shallow anterior canal, and a rather broad posterior one, the lip thin and sinuous.

Another shell Hedley and Petterd described under *Bathytoma agnata* was left there by Hedley, but it also requires separation. Hedley's specimens came from 250 fathoms off Sydney, and shells from 110 fathoms in the same locality are not very different, but some from 200–250 fathoms off Gabo Island, Bass Straits, are much larger.

Shell more sharply biconical than the previous one, the spire generally longer than the aperture, the apex being of one and a half globose, shining, smooth whorls, the succeeding sculpture is clearly differentiated, the semi-keel of nodules being a notable feature, formed along the line of the posterior channel, which is separated from the body whorl; the anterior canal is short and broad, and the columella is scarcely twisted, the inner lip strongly glazed. The new generic name, *Micantapea*, is given, with *B. agnata* Hedley as type.

<sup>166</sup> Iredale.—Rec. Austr. Mus., xiv, 1925, p. 263, pl. xliii, fig. 18.

<sup>167</sup> Jousseaume.—Le Naturaliste, ix, 1887, p. 222.

<sup>168</sup> Iredale.—Proc. Linn. Soc. N.S.W., xlix, p. 264, 1924.

Hedley and Petterd also introduced *Pleurotoma casearia* from the same 250 fathom dredging, and later Hedley placed it under *Leucosyrinx* Dall, a genus which appears to me quite different. Specimens from 110 fathoms off Sydney are much larger and show wavy lines below the periphery, a feature absent in the typical form. These may rank as a sub-species, while as the apex is shining, elevated, smooth, two whorled, and the nodulous keel of the preceding has developed into a spinose one, and the posterior canal is much longer a genus is also provided, the long posterior canal making the aperture longer than the spire.

The name *Lucerapex casearia regilla* is given to the 110 fathom shell, 21 mm. long.

#### Family MITRIDAE.

The dark-colored Mitre shells from New South Wales are puzzling, five species being allowed in Hedley's list, viz., *carbonaria* Swainson, *cookii* Sowerby, *glabra* Swainson, *rhodia* Reeve and *solida* Reeve. Hedley<sup>169</sup> discussed the species *carbonaria*, *rhodia*, and *cookii*, and I have dealt with *solida*, but the so-called *glabra* has been ignored.

The local shell differs from *carbonaria* in its longer, more attenuate spire, and its proportionately less capacious body whorl. The dead shell here figured is pale fawn, encircled by red lines, but the living shell is covered with a thick brown periostracum through which darker lines show, but, as the animal lives among rocks between, or just below, tide marks, it is always much worn away and the first few whorls missing. The figures will show the differences between the two species, and the so-called *glabra* probably grows to a much greater length, one before me from Twofold Bay measuring 96 mm. long by 24 mm. wide, the figured one from Sydney being 74 mm. by 19 mm. The aperture is of course, comparatively, smaller than that of *carbonaria*, but the columellar plaits are not unlike, being a little stronger and more transverse but of the same number, five or six. The surface is not smooth, as implied by the name *glabra*, but is cut by concentric punctate grooved lines. Swainson's *glabra* had rounded whorls, and the present species has very straight whorls, so that the Sydney shell is here named *Vicimitra exposita* sp. nov. (Plate xxiii, fig. 16.)

Upon reconsidering the matter, the figure of *glabra* seemed to suit better the description of *carbonaria*, and then it was found that the names were published simultaneously for specimens in the Bligh Collection, and consequently almost undoubtedly were synonymous. The name *glabra* was published in December, 1821, and the name *carbonaria* probably in April, 1822, so that the former name would be the valid one. The locality "New South Wales" was given in connection with the latter, and the name was taken from Humphrey's MS., which suggests Tasmania as probably the place whence the species was received. Tasmanian specimens are broader than local ones and have the whorls a little rounded, so that they agree better with the figures and description of *glabra* and *carbonaria*, and until the type or types are recovered I propose to use *Vicimitra glabra* Swainson=*carbonaria* Swainson for the Tasmanian species. This leaves the shell from Sydney, which has been known as *carbonaria*, nameless, and it is here called *Vicimitra contermina*. (Plate 4, fig. 15.)

<sup>169</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxxviii, 1913, pp. 312-314.

Shell rather large, spire attenuate, a little longer than the aperture, but body whorl large, swollen, much longer than the spire, mouth elongate. The apex is missing, eight adult whorls remain, the early whorls regularly spirally grooved, the grooves punctate, the grooves becoming obsolescent as growth proceeds, the penultimate whorl showing from twelve to twenty grooves vanishing on the lower part of the whorl; the last whorl only allows indications below the suture and around the base. The whole shell is uniform dark brown, the aperture purplish, the columella brownish-pink. The outer lip is thickened, simple, a little sinuate, canal short, broad, and open; the columella has six sloping sharply cut plaits, the anterior one smallest. The inner lip is reflected as a slight glaze extending to the posterior angle of the aperture. There are no signs of an umbilicus.

Length, 71 mm.; breadth, 28 mm.; length of aperture, 31 mm.; of body whorl, 46 mm. Type from Sydney Harbour. Animal, creamy white. Habitat, New South Wales.

#### Family NASSARIIDAE.

All the New South Wales members of this family were classed by Hedley in the one genus *Nassarius*, but obviously several distinct groups were represented. The difficulty of determining the groupnames to be used probably was the reason for the policy adopted. I have used *Niotha* for the species Hedley called *N. gemmulatus*, and *Nassarius* may be continued for *particeps* and *spiratus*, but the remainder demand adjustment. Firstly, *coronatus* Bruguière is invalid, and the record of its introduction into the local fauna needs confirmation before any name change can be made, so that for the present it might be omitted from our list. I have been unable to trace any other record of *muricatus* Quoy and Gaimard than in the Check List itself, and conclude its admission was due to some mistake, and for the present it must be rejected. The generic name *Hebra* H. and A. Adams, is available for it or its ally, when refound and re-admitted. When I<sup>170</sup> added *tasmanicus* and discussed *semigranosus* I accepted Hedley's conclusion that *nigella* Reeve was referable to the latter. Among the "Triton" dredgings from Sydney Harbour many specimens of these small "Nassas" were picked out. A small glassy shell was detected, which turned out to be *peritrema*, described from this place, but otherwise commonly known only from the Richmond River beaches. Comparison of the other shells, however, showed that the so-called "tasmanica" were undoubtedly Reeve's *nigella*, and that the so-called *semigranosa* (= *nigella* of the paper cited above) must take the name *optata* Gould. Tasmanian shells may retain the name *tasmanica* in a subspecific sense as their sculpture is more pronounced, while the southern representatives of *optata* may be subspecifically differentiated as *munieriana* as they are apparently larger, with more excentric growth, and the mouth always unarmed, whereas in the Sydney *optata* the outer lip develops armature with age. The group seems to be confined to extratropical Australia, and the genus *Tavaniiotha* is proposed, *optata* being type. Two small species found living on weeds in estuaries and lagoons are recorded as *burchardi* Philippi and *jonasi* Dunker. These are continually being confused, but the *jonasi* is the larger shell with striæ between the ribs, the mouth unarmed and the callus spreading over the body whorl. No locality was known when the species was described, but the figure agrees fairly well with the Sydney shell. Hedley cited *labecula* A. Adams, from the Philippines, as a synonym, but that name can be rejected without hesitation. Reeve named a *mangelioides*<sup>171</sup>,

<sup>170</sup> Iredale.—Proc. Linn. Soc. N.S.W., xlix, 24 October, 1924, pp. 270-271.

<sup>171</sup> Reeve.—Conch. Icon., viii, 1853, Nassa. pl. xxiii., sp. 152, December.



which has been cited here, and from the description and figure it may be regarded as a synonym. Philippi's *burchardi* was described from Adelaide, and our shells differ from the figure and description, and may be called *ellana* sp. nov. the shell being small, longitudinally ribbed, interstices smooth, mouth open, outer lip toothed, lower edge of columella nodulose, a genus *Parcanassa* being provided for this series, which recalls the *thersites* group for which Thiele<sup>172</sup> has proposed the name *Plicarcularia*, but they are of smaller size, stouter build, with less open mouth.

The group around *pauperus* Gould also appears to be nameless, though it is well known; the species are small, corded, more or less longitudinally ribbed, the mouth subcircular, very little inner lip, and outer lip regularly toothed. The new generic name *Reticunassa* is proposed, the Sydney *pauperus* Gould being type. Hedley and May described *Arcularia mobilis*<sup>173</sup> from 100 fathoms, seven miles east of Cape Pillar, Tasmania. A specimen superficially recalling that species was brought in by Mr. Dingeldei, collected by Captain Moller off Newcastle Heads, New South Wales in 40 fathoms. Although agreeing in size and form it was found to be corded not grooved, thirteen cords being counted on the body whorl, and eight on the penultimate, the intervals between the cords broad and faintly longitudinally striate; on the earlier whorls longitudinal ribs occur, succeeding the smooth turbinate two-whorled protoconch. The longitudinals vary from twelve on the post-embryonal whorl to eighteen on the penultimate, vanishing on the last whorl. The outer lid is also toothed, the teeth numbering thirteen agreeing with the cords, which over-run the very large varix. Dimensions, height, 7.5 mm.; breadth, 3.5 mm. This may be named *Reticunassa mobilis plankta* sub. sp. nov., and Hedley's *A. dipsacoides*, from still deeper water, may be placed in the same genus for the present. An overlooked local species is *Nassa mucronata* A. Adams<sup>174</sup>, which Mr. R. Blacket brought in from Long Reef, north of Manly, where I had previously found it without recognizing that it was missing from the New South Wales list, as it was a very familiar tropical shell. It is easily recognized by its flattened whorls and somewhat attenuate spire, and rather patulous mouth without any spinose ornament. It has been placed under *Zeuxis*, but it does not correlate with *taenia* Gmelin, the type of *Zeuxis*, while Tryon placed it in *Alectrion* along with *suturalis*, with which it does not agree. It is therefore here made the type of a new subgenus, *Tarazeuxis*.

After the elimination of *coronatus*, *muricatus*, and *pauperatus* the New South Wales list would read: *Nassarius particeps* Hedley, *N. spiratus* A. Adams, *N. (Tarazeuxis) mucronatus* A. Adams, *Tavaniotha nigella* Reeve, *T. n. tasmanica* Ten-Woods, *T. optata* Gould, *T. o. munieriana* Crosse, *T. peritrema* Ten-Woods, *Parcanassa jonasi* Dunker, *P. ellana* Iredale, *Reticunassa paupera* Gould, *R. mobilis plankta* Iredale, *R. dipsacoides* Hedley, *Niotha comtessei* Iredale and a new species *Niotha hawleyi* described below.

### *Niotha hawleyi*, sp. nov.

(Plate xxiv, fig. 11.)

Shell small, granulose, buccinoid, spire elate, sutures canaliculate, mouth rather open, outer lip slightly denticulate. Coloration: white, marked with brown. Apical whorls about three, glossy, white, ending in a curved varix suggesting a *Sinusugera*. The adult sculpture begins at once, closely packed longitudinal ribs being cut by spirals into evenly spaced pearls. On the penultimate whorl five rows

<sup>172</sup> Thiele.—Handb. syst. Weicht., i, 1929, p. 324.

<sup>173</sup> Hedley and May.—Rec. Austr. Mus., vii, 1908, p. 121, pl. xxiii, fig. 16.

<sup>174</sup> A. Adams.—Proc. Zool. Soc. (Lond.), 1851, p. 105.

of pearls can be counted, the number of pearls in a row being about thirty-three, the subsutural row showing these the most plainly. On the last whorl eleven rows appear, the pearls being more squarely cut. The inner lip is only reflected basally, and extends across the body whorl as a very fine glaze only. The outer lip sweeps rather backward to an open short canal, the outer edge is denticulate and internally about fifteen liræ are present.

Height, 14 mm.; breadth, 8.5 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour dredgings.

### ***Pterochelus duffusi*, sp. nov.**

(Plate xxiii, fig. 11.)

The fine shell listed by Hedley as *Murex acanthopterus* Lamarck, had been separated later as needing description, Lamarck's species being a distinct Western Australian shell. When Captain Comtesse picked out a specimen from the harbour dredgings he asked that it might be named as above. The genera of the family Muricidæ were discussed<sup>175</sup>, and the supergenera determined from the series in the British Museum (Natural History), but field collecting has proven the sections to be even better distinguished in nature than in museums. Thus, from Hedley's comparison of his *permaestus* to *capucinus*, it might have been regarded as a *Triplex*, whereas upon actual examination it is found to be a *Naquetia* form.

In the present instance, although *Pterochilus*, which is invalid, was earlier written, the emendation *Pterochelus*, a different word, can be utilised. Shell triangularly fusoid, spire a little shorter than aperture, anterior and posterior canals long and open, tri-varicose, varices flattened but not frondose. Dead shell white and rather chalky. Apex missing, six whorls remaining. Sculpture fairly fine striæ only, but subspiral ribs running along to the posterior varix, and a couple more indistinct on the body whorl. Aperture triangularly ovate, with an open canal anteriorly and posteriorly. Columella nearly straight, inner lip reflected as a strong glaze, thickened towards the posterior canal. Varix thin, widely spread, crenulate, outer lip upstanding, smooth within.

Length, 50 mm.; breadth, 41 mm.

*Habitat*.—New South Wales. Type from Broken Bay.

The Western Australian shell, which is regarded as the true *acanthopterus* Lamarck<sup>176</sup> is larger, more boldly sculptured, especially as regards the varices which are closely frilled, and while the anterior canal is open, the posterior canal is closed.

### Genus ***Torvamurex*, nov.**

(Plate xxiii, fig. 13.)

Type.—*Murex denudatus* Perry.

For *Murex palmiferus* recorded by Angas, Hedley utilized Perry's name of *denudatus*, a name somewhat descriptive of the common Sydney shell. Captain Comtesse sorted out some specimens with well developed frills on the varices, and a very beautiful specimen he contended could not be the same species as the

<sup>175</sup> Iredale.—Trans. New Zeal. Inst., xlvii, 1914, p. 469, 1915.

<sup>176</sup> Lamarck.—Encycl. Meth. Vers, Planche, 417, fig. 2, a, b, Liste, p. 4, 1816.

“denuded” shell. As Perry’s species<sup>177</sup> was localised from Van Dieman’s Land, and the shell from Victoria most resembles his figure, the name is here restricted to the southern shell, and the common shore shell here may be regarded as a geographical form which is a little more compressed, the nodules between the varices tending to resolve themselves into one large one instead of two smaller ones. The extreme form, which is here named *Torvamurex extraneus* (Plate iv, fig. 12), has developed the frilling of the varices to an abnormal extent, and is distinguished in order to have this development on record. Such a beautiful foliation as is here seen is associated theoretically with still-water conditions. It differs from the typical *denudatus* from Victoria in the presence of only one large nodule between the varices whereas the southern type has definitely two. The frilling is large and the fronds well separated, but in details the finer sculpture and general form resemble those of *denudatus*.

Length, 49 mm.; breadth, 30 mm. Type from Sydney Harbour dredgings.

On the continental shell Murices occur, and these show generally the features of still-water shells, but in this case a form of *denudatus* is found in which the shell is much smaller and the frondose varices obsolescent, thus exactly contrary to theory. It appears narrower, with the spire longer, the canal longer and more open, and showing the single inter-variceal nodule of the shore shells. It is here named *Torvamurex denudatus immunitus* subsp. nov. (Plate xxiii, fig. 14), the type measuring 28 mm. in length and 15 mm. in breadth, collected from 70 fathoms east of Sydney. Mr. W. Dingeldei brought in similar shells from 45 fathoms off Crowdy Head, north of Sydney, and it also occurs off Green Cape, so that it ranges all along the continental shelf of New South Wales.

### ***Typhina pavlova*, sp. nov.**

(Plate xxiv, fig. 12.)

Among the shells brought in by Captain Moller from trawling in 110 fathoms east of Sydney was a beautiful *Typhina*, characterised by a very long canal and a very long posterior tube.

Shell of medium size, body whorl rather globose, spire short, canal very long. Coloration pinkish, the tubes brownish-red, the same colour occurring basally. Apical whorls missing, five adult whorls, each furnished with four tubes, the last one on the last whorl produced into a long thin tube, the preceding ones being short and squat and somewhat compressed below into an obscure longitudinal rounded rib, only growth striæ showing. The mouth is almost circular, surrounded by an upstanding rim, making the mouth completely free. The posterior tube measures about 10 mm. in length and the anterior canal 13 mm.

Length, 22 mm.; breadth, 8 mm. Type from 110 fathoms east of Sydney. Habitat, New South Wales. On the Continental Shelf, deeper water.

The new subgenus *Choreotyphis* is introduced for this aberrant form.

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<sup>177</sup> Perry.—Conchology, 1811, pl. vii, fig. 2.

**Cyphonocheilus generosus**, sp. nov.

(Plate xxiv, fig. 13.)

Hedley<sup>178</sup> described *Typhis syringianus* from off Cape Three Points, New South Wales, in 45–50 fathoms, a small shell measuring 9 x 5.5 mm., with a very short canal. At the southern end of the Continental Shelf larger specimens occur, which have a longer canal with more regular tube formation. A small rounded dome-like apex, smooth, is succeeded by five whorls, each bearing four tubes preceded by a varicose rib. These tubes fall regularly into line, and there is little sculpture, the growth lines being rather obscure, and only an obsolete spiral striation occurs. The mouth is oval and complete, encircled by an upturned rim, the canal being completely closed, forming a tube.

Length, 12 mm.; breadth, 6 mm. Type from 70–85 fathoms off Green Cape, New South Wales.

*Habitat*.—New South Wales. On the Continental Shelf, in deeper water.

**Dicathais orbita** Gmelin.

Again confusion in Martyn between New Zealand and New South Wales occurred in connection with the common shore-living "Whelks," known in both countries until recently as *Purpura succincta*. Martyn localized his species as from New Zealand, but undoubtedly it came from New South Wales. Unfortunately, Martyn's names must be rejected, and in this case Gmelin introduced *Buccinum orbita* for Martyn's species, transferring Martyn's selection to a different shell.

I introduced *Neothais* for the small shells associated with this large species, and advocated its usage, but it may be as well, now that the radular features have been investigated and found to differ, to propose *Dicathais* nov., naming the Sydney species as type. Consequently *Dicathais orbita* will be the name for *Thais succincta* of Hedley's Check List. There appears to be another species in New South Wales, but sufficient material is not yet available to decide.

**Architectonica perspectiva** Linné.

(Plate xxiii, fig. 20.)

In my last notes I dealt with some species of Architectonicids and rejected *perspectiva*, as the record was apparently based on the species I described as *A. grandiosa*. Almost immediately Mr. Nash brought me in a specimen of the true *perspectiva*, which he had secured at Dundas and separated from his other shells (*grandiosa*) on account of its different coloration. Upon careful comparison this shell was found to agree generally with the Linnean species, but it differed in having an additional subsutural brown band, and the outer keel is regularly spotted on the underside; the sculpture throughout is less pronounced, and the grooves are a little more distant, vanishing on the last whorl. As the coloration seems a constant feature, this shell is named *A. perspectiva fressa* subsp. nov. It measures 39 mm. across, the minor measurement being 35 mm. and is 21 mm. in height.

<sup>178</sup> Hedley.—Mem. Austr. Mus., iv, 1903, p. 331, fig. 94.

**Architectonica relata**, sp. nov.

(Plate xxiii, fig. 19.)

From 75–85 fathoms, off Bateman's Bay, among some shells trawled were some young and one adult specimen, recalling *Solatisonax injussa*, but upon examination it proved to be a deepwater representative of *Architectonica offlexa*, being more depressed and with obsolescent radial sculpture.

Shell of medium size, conical, base flattened, umbilicus wide, more than one-third the width of the shell. The apex is darker, the coloration being fawnish-white. The longitudinal sculpture is softened, so that it becomes practically obsolete on the last whorl. Spiral grooves, however, become more prominent, and two strong ones persist on the last whorl. The crenulation of the umbilical rib is also much weaker, as is the nodulation of the peripheral keels. The umbilicus is comparatively wider.

Breadth, 25 mm.; height, 12 mm. Continental Shelf of New South Wales.

Family **MANGONUIDÆ**.

Next to *Architectonica* in the same family Hedley placed the genera *Heliacus* and *Discohelix*, though it was well known that the animal of *Heliacus* was very unlike that of *Architectonica* in radular and opercular characters. Years ago I suggested that *Omalaxis meridionalis* Hedley was not referable to *Omalaxis*, and proposed its transference to *Discohelix*, which Hedley adopted. Miss Mestayer<sup>179</sup> has described a near ally of *meridionalis* under the name *Mangonua bollonsi*, and associated our species in the new genus there proposed, the orthotype being the Neozelanic species. At the same time she suggested that it might represent a distinct family, a solution here accepted. Further, she proposed another genus, *Awarua*, for the species Murdoch and Suter had introduced as *Omalaxis amœna*, and which I had recorded as apparently being merely a juvenile *Heliacus*, using that generic name in a broad sense.

A perfect specimen of Hedley's *meridionalis* was brought in by Dingeldei, picked off the trawl lines by Captain Möller, and two others of a very beautiful shell recalling *amœna*. It was then found that Chapman<sup>180</sup> had described *Homalaxis præmeridionalis* from the Tertiary of Victoria, which is very close to the recent species.

The shell Hedley<sup>181</sup> named *Omalaxis radiata*, from Mast Head Reef, Queensland, has nothing whatever to do with this family, and is here referred to the family Liotiidæ with the new generic name *Liotiaxis*.

Comparisons with the known forms of Heliacoid shells demands the restriction of *Awarua* to the *amœna* type, and provision of a new genus for the shell sometimes known as *Heliacus stramineus*, another for the one above mentioned recalling *amœna*, which is very distinct and beautiful.

<sup>179</sup> Mestayer.—Trans. New Zeal. Inst., lxi, p. 144, 29–31 May, 1930.

<sup>180</sup> Chapman.—Proc. Roy. Soc. Vict. (N.S.), xxv, August, 1912, p. 189, pl. xii, figs. 4–6.

<sup>181</sup> Hedley.—Proc. Linn. Soc. N.S.W., xxxii, 1907, p. 506, pl. xx, figs. 53–55.

Genus *Torinista*, nov.

(Plate xxiv, fig. 15.)

Type.—*T. popula* sp. nov.

Shell small, subdiscoidal, or perhaps better lentiform, apex anastrophe, umbilicus wide, perspective, about one-third the major diameter of the shell. Coloration of dead shell pale brown. The sculpture of the last whorl may be thus described. Following the suture is a narrow gutter, succeeded by a strong rib cut into lozenges; the periphery is encircled by another stout rib cut into finer lozenges, and between, forming the upper surface of the whorl, lie strong radial liræ cut imperfectly by two encircling grooves. Below the peripheral keel is another similar but weaker keel with a deep groove between; then on the base are four somewhat similar ridges, a little flattened, with wide spaces between and all overridden by strong threads, which almost develop into liræ. The umbilicus is encircled by a thick broad rib, strongly crenulated but not cut into lozenges. The columella is almost perpendicular, ending in a small pseudo-canal; a thin glaze crosses the body whorl to the outer lip which is thin, the mouth circular.

Major diameter, 9.5 mm.; minor diameter, 8 mm.; height, 5 mm.

*Habitat*.—New South Wales. Type from Sydney Harbour.

Just after this was completed Messrs. C. F. and J. Laseron brought in a smaller shell dredged in a couple of fathoms in North Harbour, Port Jackson. It is flatter, with a wider umbilicus, showing a canaliculate suture through the lower peripheral keel being longer than the upper, and the succeeding whorl joining on it. The sculpture of the under surface is also bolder, so that it is here named *Torinista laseronorum* sp. nov., the shell measuring 6 mm. by 4.5 mm. by 3 mm. It will be figured later.

*Claraxis illustris*, gen. et. sp. nov.

(Plate xxiv, fig. 16.)

Shell flatly lentiform, sharply angled peripherally, widely openly umbilicate, elegantly sculptured, coloration white. Apex anastrophe, four and a half adult whorls. The sculpture of the last whorl is as follows. Subsuturally there are three ridges, rather weak, then a bold median one, successively a minor one, and then two major, the last forming an angulate keel for the periphery; the base is a little flattened just below this peripheral keel, then swells out into a rounded whorl carrying seven or eight bold ridges right into the umbilical cavity. The ridges of the upper surface are finely cut into lozenges, the outer peripheral keel being very finely closely crenulate; the ridges of the lower surface are more widely spaced, threaded between, and roundly nodulose. The outer lip shows the peripheral keel to be hollow, and then the aperture becomes circular, the columella short, basally rounded, showing no signs of a canal.

Major diameter, 8.5 mm.; minor diameter, 7.5 mm.; height, 4 mm.

*Habitat*.—Continental shelf of New South Wales. Type from 45 fathoms off Crowdy Head, near Manning River.

Family **ELLOBIIDÆ**.

The determination of the common little "estuarine" species allowed the discrimination of three species of *Ophicardelus*<sup>182</sup> along the eastern coast of Australia from Port Curtis, Queensland, to Victoria and Tasmania. From the Triton dredgings Mr. E. F. Nash picked out another shell which recalled a small member of this family I had collected at Low Isles, North Queensland. This necessitated re-examination of the other species, and much confusion was found. A similar shell (a distinct species) had been named *Cassidula zonata* by H. and A. Adams from Sydney, and this had been catalogued by Hedley under *Rhodostoma*. That genus was proposed for the large *auris-felis* Linné whose congener, *angulifera* Petit, I had also secured at Low Isles. The small Sydney shell seemed more closely related to some of the species classed in *Ophicardelus*, and, though Gray introduced a number of names for small shells of this family, none seems applicable to our shell, which is here named *Melosidula*, type *C. zonata* H. and A. Adams. The shell, picked out by Nash, agreed fairly well in sculpture with the Low Isles' shells, which appeared to be *granosa*, but is longer in the spire, and with the mouth as in *Melosidula*, the outer lip thickened and with a strong median tooth; it is 8.5 mm. long and 5 mm. broad, the spire nearly as long as the aperture. It is here named *Melosidula granosula* sp. nov. (Plate xxiv, fig. 22).

Connolly<sup>183</sup> showed that *xanthostoma* could not be classed under *Marinula*, which was equivalent to the genus *Cremmobates* as used by Hedley and Suter. The new generic name *Maripythia* is therefore proposed. The generic name *Plectotrema* was shown to be invalid by Sykes<sup>184</sup> when he reviewed the species, but the alternative *Laemodonta* Philippi<sup>185</sup> was introduced for a Sandwich Island shell *striata*, with which our shell does not appear to be congeneric. Apparently *Plectotrema* may be still employed for our species, as Sykes regarded *lirata* as almost inseparable from *typicum*, the orthotype of *Plectotrema*.

Genus **Limulatys**, nov.

(Plate xxiv, fig. 20.)

Type.—*L. reliquus* sp. nov.

Shell small, shining, thin, elongate oval, not pinched apically, no apical umbilicus, but umbilical fissure at opposite end. Coloration white, with milky spiral lines, towards the ends a faint ridging agreeing with these lines, but otherwise smooth. The apical depression is not perforate, the outer lip longer than the body of the shell, joining the apical hollow with a downward twist. Columella a little sinuate, thin, but umbilical chink clearly shown. Outer lip thin, aperture narrow, a little broadened anteriorly.

Length, 7 mm.; breadth, 4 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

Another specimen is larger, with the outer lip broken and is white with no milky lines. The shell is sub-keeled medially, the ends of the shell strongly grooved, the grooves more closely packed around the apical depression, which is quite imperforate, the middle section of the shell being smooth. The aperture is longer than the body-whorl, the descending continuation into the apex being strongly twisted. The

<sup>182</sup> Iredale.—Vict. Naturalist, xlii, March, 1926, pp. 268-270, figs. in text.<sup>183</sup> Connolly.—Ann. S. Afr. Mus., xii, 1915, p. 116.<sup>184</sup> Sykes.—Proc. Mal. Soc. (Lond.), i, March, 1895, p. 241.<sup>185</sup> Philippi.—Zeits. für Malak., 1846, p. 98.

columella is subdentate and strongly plectect over the narrow but distinct umbilicus. Length, 9 mm.; breadth, 4 mm. This may be called *Tepidatys tremens* gen. et sp. nov. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

Brazier<sup>186</sup> described *Atys cheverti* from Darnley Island and this was figured by Hedley<sup>187</sup>; this species seems to approach the above in general features. Hedley<sup>188</sup> introduced *Atys pransa*, from 100 fathoms off Wollongong, New South Wales, but it was omitted from his Checklist. It is a curious little solid shell, perforate above and below, the apical lip continuation not twisted, the outer lip thickened, sinuate, the columella also thickened; both perforations are deep and the shell is pinched apically and swollen basally. It may not be at all closely related to *Atys*, and the new genus *Spissitydeus* is introduced for it. I mentioned that *Dinia* H. and A. Adams<sup>189</sup> was available for *dentifera* A. Adams, but it proves to have been anticipated by Walker<sup>190</sup> some three months earlier. The new generic name *Diniatys* is introduced to replace Adams' name.

#### Family ACTEONIDAE.

Under this name Hedley included the genera *Acteon* Montfort 1810, and *Pupa* Bolten 1798, but the latter being earlier the name should be *Pupidæ*. Under the generic name *Pupa* he included three species, *affinis* A. Adams, *coccinata* Reeve, and *nivea* Angas, only the last named having been described from Australian waters.

*Solidula affinis* A. Adams was described from China Seas, and the type has been recognized by Smith as merely a small form of *solidula* Linné. Apparently the type has not been figured, as when Watson<sup>191</sup> used the name for a Sydney shell he probably gave an illustration of our species. In any case there appears to be a name for the local shell, as Reeve<sup>192</sup> described *Tornatella fumata* from Australia, and this figure seems applicable to our shell. While Reeve described it as "transversely densely linearly grooved throughout," and this is the normal state (Plate xxiv, fig. 26) specimens may be found almost smooth medially (Plate xxiv, fig. 24). The variation in the sculpture is common in this group, as some shells of *nivea* from Sydney Harbour dredgings also show this state, and thus mimic *intermedia* A. Adams, the South Australian species.

The coloration of *fumata* is fairly constant, some lacking the white lines running round the body whorl, others showing them rather boldly, but the general appearance of a series is uniform. In form some are a little more elongate than others but none are as attenuate as *nivea*, nor swollen as "*coccinata*." The sculpture does not vary much either, as there are generally six flat-topped liræ on the penultimate whorl separated by narrow grooves. On the body whorl these are normally about twenty-five equal liræ, but these may break up into two in an irregular, and therefore easily noted, fashion and consequently number up to forty unequal liræ. A medium-sized specimen will measure 18 mm. long by 8 mm. broad, the largest 23 mm. by 10 mm. Many specimens were sorted out of the "Triton" dredgings in Sydney Harbour, while it was found alive burrowing in the sand at Gunnamatta Bay, Port Hacking, making a track in the sand like that of the Naticoid shells, but of course very much smaller. The animal had an operculum.

<sup>186</sup> Brazier.—Proc. Linn. Soc. N.S.W., ii, 1877, p. 83.

<sup>187</sup> Hedley.—Rec. Austr. Mus., iv, 1901, pt. 30, pl. xvii, fig. 38.

<sup>188</sup> Hedley.—Proc. Linn. Soc. N.S.W., 1904, p. 191, pl. ix, figs. 21–22.

<sup>189</sup> H. and A. Adams.—Gen. Rec. Moll., ii, September, 1854, p. 20.

<sup>190</sup> Walker.—List Lepid. Brit. Mus., i, ante 1 May, 1854, p. 189.

<sup>191</sup> Watson.—Rep. Sci. Res. Challenger Zool., xv, 1886, p. 630, pl. 47, fig. 1.

<sup>192</sup> Reeve.—Conch. Icon., xv, June, 1865, pl. iii, fig. 10.



**Acteon dolichoroseus**, sp. nov.

(Plate xxiv, fig. 27.)

Shell medium, elongate oval, spire acuminate as long as the aperture; whorls seven with initial one smooth; coloration rosy, with subsutural band of white. Sculpture of flattened liræ, narrow, not much broader than interspaces; on last whorl thirty are easily counted, of which some are in duplicate; threads over-ride the whole but are indistinct and do not lattice the interstices of the liræ clearly; on the penultimate whorl eight liræ can be counted and seven on the preceding; the sutures definite but not shouldered. Outer lip thin, sinuate, columella with fold and glaze crossing body to edge of outer lip. Umbilical chink present.

Length, 18.5 mm.; breadth, 8.5 mm.; length of spire, 9 mm. Sydney Harbour dredgings ex "Triton."

*Habitat*.—New South Wales.

Along with this was a specimen of *roseus* measuring 22 mm. by 13 mm. with spire length 8 mm.

**Acteon subroseus**, sp. nov.

(Plate xxiv, fig. 25.)

Shell of medium size, elongate oval, spire acuminate, shorter than aperture; whorls seven with initial whorl unsculptured; coloration of living shell brownish white; dead shells chalkwhite.

Sculpture of flat liræ, broader than the interspaces, twenty-five on last whorl, basal ones over-ridden by longitudinal threads which appear in the interstices only on the main part of the whorl, liræ fairly evenly spaced, some of the lower ones divided by a median line; one below suture smaller; seven liræ on penultimate whorl, six on preceding. Outer lip thin, sinuate, columella showing a slight fold, glaze connecting it with the outer lip. No umbilical chink present.

Length, 13 mm.; breadth, 9 mm.; length of aperture, 7 mm.

Continental Shelf from Green Cape to Cape Hawke; type from off Montague Island, 60-70 fathoms. The Continental Shelf *Acteon* was included in Hedley's New South Wales list under the name *austrinus* Watson, but that species was based on a juvenile shell of a *Leucotina*, as Hedley recognized when comparing the type at the British Museum.

**Acteon fructuosus**, sp. nov.

(Plate xxiv, fig. 28.)

Shell small, oval, spire a little acuminate, shorter than aperture, shining, whorls five, with a smooth tilted apex; coloration white.

Sculpture of flat-topped liræ, crowded, so that interstices appear as linear grooves only: on body whorl there are about thirty, the basal half dozen rounded and separate, showing longitudinal threads, which on the main portion of the whorl are indistinct and negligible. The penultimate whorl shows four broad liræ, with lines between; preceding one, three, with indistinct lining; sutures well impressed, almost canaliculate. Outer lip thin, with columella, showing slight fold and weak glaze connecting with outer lip. Umbilicus deep and narrow.

Length, 8 mm.; breadth, 5.5 mm.

Continental Shelf from Cape Everard northwards to off Sydney. Type from 70 fathoms off Green Cape, southern New South Wales.

Apparently closely related to *Actaeon retusus* Verco<sup>193</sup>, from South Australian deep-waters.

***Pupa roseomaculata*, sp. nov.**

(Plate xxiv, fig. 29.)

Fifty years ago Brazier<sup>194</sup>, in dredging inside Port Jackson Heads in 5 fathoms found ten specimens of a shell he determined as *Buccinulus coccinatus* Reeve. Since then it had not been met with until Captain Comtesse and Mr. E. F. Nash sorted out three specimens from the Triton dredgings. Reeve described his species from the island of Mindanao, Philippines, and this has been regarded by Smith and Pilsbry as a variation only of *solidula* Linné. The local shell does not agree with Reeve's figure, and is certainly not a variety of Linné's species, so it must be described as new.

Shell of medium size, oval, spire short, body swollen but not obese. Coloration, white with red spots, the spots being spaced on the concentric ridges and arranged more or less linearly in series. Whorls seven, spire not concave sided, less than one-third the length of the aperture.

Sculpture, on penultimate whorl five flat-topped liræ with rather wide interstices, which are crossed by longitudinal threads; on the bodywhorl about twenty-two equal broad flat-topped liræ can be counted, the threaded interspaces being here very narrow. The columellar fold is large and strongly bifid, while the upper parietal fold is prominent and noticeable; only a very fine glaze occurs on the bodywhorl, connecting with the outer lip, which is thin and sharp.

Length, 18 mm.; breadth, 10 mm.: length of aperture, 14 mm. Type from Sydney Harbour dredgings ex "Triton."

***Pupa tragulata*, sp. nov.**

(Plate xxiv, fig. 23.)

Shell small, oval, spire medium, sculptured with coarse flat-topped liræ. Coloration white. Whorls six, spire a little shorter than the aperture. Sculpture of flat-topped liræ separated by comparatively wide grooves, which show distinct longitudinal threading. On the penultimate whorl there are only four liræ, with grooves of equal width, while on the bodywhorl there are about twenty, the basal half dozen being small and more crowded. The shell is more solid than either *nivea* or *fumata*, the outer lip sharp. Columellar lower fold pronounced, upper one notable, a thick glaze crossing to the outer lip.

Length, 10 mm.; breadth, 5.5 mm. Type from off Sydney 75-85 fathoms.

*Habitat*.—New South Wales. All along the continental shelf.

<sup>193</sup> Verco.—Trans. Roy. Soc. South Austr., xxxi, p. 309, pl. xxix, fig. 12, 1907.

<sup>194</sup> Brazier.—Proc. Linn. Soc. N.S.W., iv, p. 429, 1880.

***Colosyrnola decolorata*, sp. nov.**

(Plate xxiv, fig. 14.)

Shell elongate, awl-shaped, shining, twelve whorls, apical ones missing, coloration white, with a golden brown peripheral band. Whorls very narrow, very finely microscopically scratched, sutures well impressed although whorls are straight sided, the sutural crenulation subobsolete. Columella with two plaits, the posterior one prominent, the anterior one indistinct, inner lip reflected, umbilicus narrow, outer lip thin, smooth inside.

Length, 13.5 mm.; breath, 5 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

Genus ***Rhizorus***.

Hedley included two species under the genus *Rhizorus*, *rostratus* A. Adams (from Port Lincoln, South Australia) and *tragula* Hedley. Hedley<sup>195</sup> figured the New South Wales shell as *rostrata*, but pointed out the differences, so that the name *Volvulella parata* is here given to the figured specimen, as *Rhizorus* was given to a different Mediterranean shell. Thiele<sup>196</sup> has used *Volvula* A. Adams 1850 (Synonym, *Volvulella* R. B. Newton 1891), for the Mediterranean species, overlooking Montfort's *Rhizorus* altogether. *Volvula* A. Adams was rejected by R. B. Newton on account of a prior *Volvulus*, but Pilsbry demurred and used *Volvula* even as Thiele has done. There is, however, a prior *Volvula* Gistel<sup>197</sup> which settles all arguments, and as Bucquoy, Dautzenberg, and Dollfus named *rostrata* as type of *Volvula* A. Adams, Newton's alternative must be used for the Australian shell.

Genus ***Ringiculadda***, nov.

Type.—*Ringicula semisculpta* Hedley.

When Hedley<sup>198</sup> introduced *Ringicula semisculpta* from 100 fathoms 40 miles south of Cape Wiles, South Australia, he also recorded it from 80 fathoms off Narrabeen, and 300 fathoms off Sydney, New South Wales, but omitted it by accident from his New South Wales Checklist.

Specimens are being found among the recent trawled material, and these prove upon comparison to be proportionately narrower but otherwise similar, so that they may be named *Ringiculadda semisculpta frigidula* subsp. nov., the type being from 110 fathoms off Sydney, 4.5 mm. in height by 3 mm. wide. The type of *Ringicula* is a fossil, *R. ringens*, and Morlet<sup>199</sup> monographed the species of the genus, and the fossil is not much like our forms, which are smaller, with less callus on the bodywhorl, the teeth less notable, especially the parietal one, which is often missing, and the outer lip less variced.

<sup>195</sup> Hedley.—Mem. Austr. Mus., iv, 1903, p. 394, fig. 109.

<sup>196</sup> Thiele.—Handb. syst. Weicht., ii, 1931, p. 390.

<sup>197</sup> Gistel.—Nat. Thierr. hoh. Schulen., 1848, p. viii.

<sup>198</sup> Hedley.—Zool. Res. Endeavour, 1909-10, i, 1911, p. 113, pl. xx, figs. 39-40, 22 December.

<sup>199</sup> Morlet.—Journ. de Conch., xxvi, 1878, pp. 113-133, April, and pp. 251-295, 1 July.

Genus *Ventomnestia*, nov.

(Plate xxiv, fig. 21.)

Type.—*V. colorata* sp. nov.

Mr. H. S. Mort picked out of the Harbour dredgings a small Cylichnid, which, bearing grooves, is at once separable from the New South Wales species, and, recalling the Queensland shells known as *Cylichna bizona* A. Adams, was compared and found to agree. Mr. Dingeldei at the same time found a second specimen.

*Bulla bizona* was described by A. Adams<sup>200</sup> from the China Sea, and Australian specimens, though superficially resembling them, are not reticulately sculptured as Adams described, so that they cannot be regarded as identical.

In 1854, H. and A. Adams<sup>201</sup> proposed *Mnestia* for *bizona* A. Adams and *marmorata* A. Adams. In the *Illustr. Conch.*, Kobelt<sup>202</sup> misspelt the name *Morestia*, and named as type, *marmorata* A. Adams,<sup>203</sup> which is quite different from our species, and certainly not congeneric with *bizona*. This action must be confirmed by definitely stating that *Bulla marmorata* is the type of *Mnestia*, and naming the group to which *bizona* is referable.

The Sydney shell may be described as follows:—Shell small, cylindrical, narrowly deeply perforate, columella straight, inner lip reflected, outer lip extending above the apex. The coloration of the dead shell is cream, with a broad pale brown band. The sculpture consists of wavy concentric grooves, rather irregularly spaced, the apical umbilicus smooth.

Length, 6 mm.; breadth, 2.5 mm. Type from Sydney Harbour dredgings.

*Habitat*.—New South Wales.

Quite unlike the local Cylichnids, such as *C. thetidis* Hedley and "*C. arachis* Q. and G.," which are larger, thinner, smoother and with a definite twist on the columella. The New South Wales shell known as *C. arachis* differs from the West Australian type in the apical umbilicus, which is much narrower. The radular characters have been recorded as approaching those of *Haminœa* more than those of *Cylichna*, so the new generic name *Adamnestia* is introduced, the New South Wales form being named *Adamnestia peroniana* and selected as type.

Family **HYDATINIDÆ.**

This name has priority over Hedley's choice Aplustridæ, and the species Hedley included under the genus *Aplustrum* is so different that Pilsbry<sup>204</sup> introduced the name *Austrodiaphana*, which must now be utilized, while Pilsbry placed it in his family Scaphandridæ.

Through the rejection of Martyn's names, *circulata* Martyn must now give way to *zonata* Solander,<sup>205</sup> a name given to the shell figured by Born<sup>206</sup> as *Bulla amplustre* Linné, but which was not the Linnean species. Born's locality was "Asia," but Solander gives "China," where it may occur.

<sup>200</sup> A. Adams.—*Thes. Conch. (Sow.)*, pt. xi, (Vol. ii), p. 595, pl. 125, fig. 148, 1850.

<sup>201</sup> H. and A. Adams.—*Gen. Rec. Moll.*, ii, p. 10, 1854.

<sup>202</sup> Kobelt.—*Illustr. Conchyl.*, Iief. 6, p. 172, 1878.

<sup>203</sup> A. Adams.—*Thes. Conch. (Sow.)*, pt. xi, (Vol. ii), p. 594, pl. 125, fig. 145, 1850.

<sup>204</sup> Pilsbry.—*Man. Conch. (Tryon)*, xv, 1893, p. 287.

<sup>205</sup> Solander.—*Cat. Portland Museum*, (ante 24 April) 1786, p. 164, lot 3561; p. 175, lot 3758.

<sup>206</sup> Born.—*Mus. Cæs. Vindob.*, 1780, p. 204, pl. ix, fig. 1.

A few years later Gmelin<sup>207</sup> introduced *Bulla velum*, giving for references Martin neust Mannig, p. 409, t. 1, f. 10, and Chemn. Conch., 10, t. 146, f. 1348, 1349, the locality of the latter reference being Tranquebar.

There is a conchological difference between the shells of *cinctoria* Perry and *zonata* Solander, when compared with that of the type of *Hydatina, physis* Linné, and comparison of the animals will most probably indicate greater differences. A subgeneric name *Hydatoria* is here provided, *cinctoria* Perry being named as type. It may be noted that the somewhat variable shell of "*physis* Linné" has defied separation on conchological characters, but animal features may provide a solution. Thus Risbec<sup>208</sup> has published a drawing of the egg-string of the New Caledonian "*physis*," which looks very unlike that<sup>209</sup> of the local shell called "*physis*."

The curious little shell which Hedley<sup>210</sup> called *Hydatina exigua* is obviously not congeneric with the preceding species, and is here distinguished generically with the new name *Noalda*. It is less than two millimetres in length and breadth, and the apex is quite different from that of *Hydatina*, the body whorl being also comparatively smaller, the mouth consequently more open.

A list of new names proposed in this essay follows hereunder :—

- Destacar* gen. nov. Type *Arca metella* Hedley.  
*Samacar* gen. nov. Type *Arca strabo* Hedley.  
*Lopha hyotis notina* subsp. nov.  
*Saxostrea* gen. nov. Type *Ostrea commercialis* Iredale and Roughley.  
*Dimyarina* gen. nov. Type *Dimya corrugata* Hedley.  
*Monia deliciosa* sp. nov.  
*Anomia descripta* sp. nov.  
*Musculus ulmus* sp. nov.  
*Quendreda* gen. nov. Type *Dacrydium fabale* Hedley.  
*Eucrassatella cumingii wardiana* subsp. nov.  
     *baxteri* subsp. nov.  
     *kingicola verconis* subsp. nov.  
     *genuina* sp. nov.  
*Volupicuna* subgen. nov. Type *Carditella delta* Tate and May.  
*Saltocuna* gen. nov. Type *Cuna particula* Hedley.  
*Cunanax* gen. nov. Type *Cuna pisum* Hedley.  
*Condylocuna* gen. nov. Type *Condylocardia projecta* Hedley.  
     *cambrica* sp. nov.  
*Radiocondyla* gen. nov. Type *Radiocondyla arizela* Iredale.  
     *arizela* sp. nov.  
*Carditellona* gen. nov. Type *Carditella angasi* Smith.  
*Carditellopsis* gen. nov. Type *Carditella elegantula* Tate and May.  
*Talocodakia* subgen. nov. Type *Epicodakia kennethi* Iredale.  
*Epicodakia kennethi* sp. nov.  
*Divalucina* gen. nov. Type *Lucina cumingii* A. Adams and Angas.  
     *cumingii bardwelli* subsp. nov.  
*Toralimysia* gen. nov. Type *Toralimysia excentrica* Iredale.  
     *excentrica* sp. nov.

<sup>207</sup> Gmelin.—Syst. Nat., pt. vi, 1791, p. 3433.

<sup>208</sup> Risbec.—Arch. Mus. d' Hist. Nat. (Paris), (6), iii, 1928, p. 40, text fig. 6.

<sup>209</sup> McNeill and Livingstone.—Austr. Mus. Mag., iii, 1928, p. 240, fig. in text

<sup>210</sup> Hedley.—Rec. Aust. Mus., viii, 1912, p. 158, pl. 45, fig. 46.

- Byssobornia* subgen. nov. Type *Bornia filosa* Hedley.  
*Marikellia* gen. nov. Type *Kellia solida* Angas.  
*Ambuscintilla* gen. nov. Type *Ambuscintilla præmium* Iredale.  
     *præmium* sp. nov.  
*Regozara* gen. nov. Type *Regozara olivifer* Iredale.  
     *olivifer* sp. nov.  
*Redicirce* gen. nov. Type *Redicirce mistura* Iredale.  
*Redicirce mistura* sp. nov.  
     *consola* sp. nov.  
*Pitarina osmunda* sp. nov.  
*Granicorium attonitum* sp. nov.  
*Katelsia enigma* sp. nov.  
*Parataptes scordalus* sp. nov.  
*Acritopaphia* gen. nov. Type *Acritopaphia transfusa* Iredale.  
     *transfusa* sp. nov.  
*Glaucometta* gen. nov. Type *Glaucometta plankta* Iredale.  
     *plankta* sp. nov.  
*Tellinota* gen. nov. Type *Tellinota roseola* Iredale.  
     *roseola* sp. nov.  
*Pristipagia* gen. nov. Type *Pristipagia gemonia* Iredale.  
     *gemonia* sp. nov.  
*Pinguimacoma* gen. nov. Type *Pinguimacoma hemicilla* Iredale.  
     *hemicilla* sp. nov.  
*Milligaretta* gen. nov. Type *Milligaretta venta* Iredale.  
     *venta* sp. nov.  
*Flavomala* gen. nov. Type *Solen biradiatus* Wood.  
*Florisarka* gen. nov. Type *Florisarka onuphria* Iredale.  
     *onuphria* sp. nov.  
*Distugonia* gen. nov. Type *Distugonia inopinata* Iredale.  
     *inopinata* sp. nov.  
*Ensiculus hilaris* sp. nov.  
*Minolops gertruda* sp. nov.  
*Benthastelena* gen. nov. Type *Benthastelena katherina* Iredale.  
     *katherina* sp. nov.  
*Mazastele* gen. nov. Type *Trochus glyptus* Watson.  
*Partubiola* gen. nov. Type *Partubiola blancha* Iredale.  
     *blancha* sp. nov.  
*Larinopsis ostensus* sp. nov.  
*Smaragdista* gen. nov. Type *Smaragdista tragena* Iredale.  
     *tragena* sp. nov.  
*Pictoneritina* gen. nov. Type *Neritina oualanensis* Lesson.  
*Anafossarus* gen. nov. Type *Fossarus sydneyensis* Hedley.  
*Difalaba* gen. nov. Type *Difalaba opiniosa* Iredale.  
     *opiniosa* sp. nov.  
*Ataxocerithium conturbatum* sp. nov.  
     *scruposum* sp. nov.  
     *applenium* sp. nov.  
*Geminataxum* subgen. nov. Type *Ataxocerithium applenium* Iredale.  
*Velacumantus* gen. nov. Type *Cerithium australe* Quoy and Gaimard.  
*Gazameda decoramen* sp. nov.

- Sirius meracus* sp. nov.  
     *desponsus* subsp. nov.  
     *chrestus* subsp. nov.
- Separatista fraterna* sp. nov.
- Halotapada* gen. nov. Type *Halotapada nubila* Iredale.  
     *nubila* sp. nov.
- Tropidorbis* gen. nov. Type *Tropidorbis mendicus* Iredale.  
     *mendicus* sp. nov.
- Sigaretornus* gen. nov. Type *Adeorbis sigaretinus* Pilsbry.
- Mazescala* gen. nov. Type *Mazescala thrasys* Iredale.  
     *thrasys* sp. nov.  
     *heloris* sp. nov.
- Laeviscala tacita* sp. nov.
- Acutiscala minoa* sp. nov.  
     *ampacta* sp. nov.  
     *fabia* sp. nov.  
     *coreta* sp. nov.  
     *christyi* sp. nov.
- Pudentiscala* subgen. nov. Type *Acutiscala christyi* Iredale.
- Limiscala helicornua* sp. nov.
- Obstopalia* gen. nov. Type *Obstopalia lixa* Iredale.  
     *lixa* sp. nov.
- Solvaclathrus* gen. nov. Type *Solvaclathrus jacobiscala* Iredale.  
     *jacobiscala* sp. nov.
- Folaceiscala carchedon* sp. nov.  
     *barissa* sp. nov.  
     *antisoa* sp. nov.  
     *pindasa* sp. nov.
- Crenuliscala* subgen. nov. Type *Folaceiscala pindasa* Iredale.
- Narvaliscala* gen. nov. Type *Narvaliscala dorysa* Iredale.  
     *dorysa* sp. nov.
- Murdochella macrina* sp. nov.
- Dissopalia* gen. nov. Type *Scala turrisphari* Hedley.
- Plastiscala* gen. nov. Type *Scala morchi* Angas.  
     *morchi bentha* subsp. nov.  
     *profundior* subsp. nov.
- Pomiscala* gen. nov. Type *Scala perplicata* Iredale.
- Dannevigena* gen. nov. Type *Dannevigena martyr* Iredale.  
     *martyr* sp. nov.
- Nodiscala apostolorum* sp. nov.
- Rectacirsa* gen. nov. Type *Rectacirsa fregata* Iredale.
- Rectacirsa fregata* sp. nov.
- Cymatilesta* gen. nov. Type *Septa spengleri* Perry.
- Cabestanimorpha* gen. nov. Type *Triton exaratus* Reeve.
- Particymatium* gen. nov. Type *Tritonium strangei* A. Adams and Angas.
- Septa?* *blacketi* sp. nov.
- Cymatilesta waterhousei tepida* subsp. nov.
- Ranularia sinensis defrenata* subsp. nov.
- Tritonocauda caudata vulticula* subsp. nov.
- Vernotriton* gen. nov. Type *Lotorium pumilio* Hedley.
- Phanozesta* gen. nov. Type *Phanozesta remensa* Iredale.

- Phanozesta remensa* sp. nov.  
*Apollon facetus* sp. nov.  
*Apollon deliberatus* sp. nov.  
*Annaperenna* gen. nov. Type *Ranella verrucosa* Sowerby.  
*Quantonatica* subgen. nov. Type *Natica subcostata* Tenison-Woods.  
*Notocochlis cothurnata* sp. nov.  
*Notocochlis schoutanica diatheca* subsp. nov.  
*Mammilla plumatilis* sp. nov.  
*Marseniopsis innominatus* sp. nov.  
*Diminovula manifesta* sp. nov.  
*Relegamoria* gen. nov. Type *Relegamoria molleri* Iredale.  
*molleri* sp. nov.  
*Ancillista* gen. nov. Type *Ancillista velesiana* Iredale.  
*velesiana* sp. nov.  
*Columbarium hedleyi* sp. nov.  
*trabeatum* sp. nov.  
*Colus genticus* sp. nov.  
*Fractolatirus* gen. nov. Type *Fractolatirus normalis* Iredale.  
*normalis* sp. nov.  
*Benthindsia* gen. nov. Type *Benthindsia problematica* Iredale.  
*problematica* sp. nov.  
*Sydaphera obnixa* sp. nov.  
*Arizelostoma* gen. nov. Type *Arizelostoma laseroni* Iredale.  
*laseroni* sp. nov.  
*Trigonaphera* gen. nov. Type *Trigonostoma vinnulum* Iredale.  
*Benthofascis* gen. nov. Type *Bathytoma biconica* Hedley.  
*Micantapex* gen. nov. Type *Bathytoma agnata* Hedley.  
*Lucerapex* gen. nov. Type *Pleurotoma casearia* Hedley.  
*casearia regilla* subsp. nov.  
*Vicimitra exposita* sp. nov.  
*contermina* sp. nov.  
*Tavaniotha* gen. nov. Type *Nassa optata* Gould.  
*Parcanassa* gen. nov. Type *Parcanassa ellana* Iredale.  
*ellana* sp. nov.  
*Reticunassa* gen. nov. Type *Nassa paupera* Gould.  
*mobilis plankta* subsp. nov.  
*Tarazeuxis* subgen. nov. Type *Nassa mucronata* A. Adams.  
*Niotha hawleyi* sp. nov.  
*Pterochelus duffusi* sp. nov.  
*Torvamurex* gen. nov. Type *Murex denudatus* Perry.  
*extraneus* sp. nov.  
*denudatus immunitus* subsp. nov.  
*Typhina pavlova* sp. nov.  
*Choreotyphis* subgen. nov. Type *Typhina pavlova* Iredale.  
*Cyphonochelus generosus* sp. nov.  
*Dicathais* gen. nov. Type *Buccinum orbita* Gmelin.  
*Architectonica perspectiva fressa* subsp. nov.  
*relata* sp. nov.  
*Liotiaxis* gen. nov. Type *Omalaxis radiata* Hedley.  
*Torinista* gen. nov. Type *Torinista popula* Iredale.  
*popula* sp. nov.



- Torinista laseronorum* sp. nov.  
*Claraxis* gen. nov. Type *Claraxis illustris* Iredale.  
*illustris* sp. nov.  
*Melosidula* gen. nov. Type *Cassidula zonata* H. and A. Adams.  
*granosula* sp. nov.  
*Maripythia* gen. nov. Type *Marinula xanthostoma* H. and A. Adams.  
*Limulatys* gen. nov. Type *Limulatys reliquus* Iredale.  
*reliquus* sp. nov.  
*Tepidatys* gen. nov. Type *Tepidatys tremens* Iredale.  
*tremens* sp. nov.  
*Spissitydeus* gen. nov. Type *Atys pransa* Hedley.  
*Diniatys* gen. nov. Type *Atys dentifera* A. Adams.  
*Acteon dolichoroseus* sp. nov.  
*subroseus* sp. nov.  
*fructuosus* sp. nov.  
*Pupa roseomaculata* sp. nov.  
*tragulata* sp. nov.  
*Colsyrnola decolorata* sp. nov.  
*Volvulella parata* sp. nov.  
*Ringiculadda* gen. nov. Type *Ringicula semisculpta* Hedley.  
*semisculpta frigidula* subsp. nov.  
*Ventomnestia* gen. nov. Type *Ventomnestia colorata* Iredale.  
*colorata* sp. nov.  
*Adamnestia* gen. nov. Type *Adamnestia peroniana* Iredale.  
*peroniana* sp. nov.  
*Hydatoria* subgen. nov. Type *Bulla cinctoria* Perry.  
*Noalda* gen. nov. Type *Hydatina exigua* Hedley.

## EXPLANATIONS OF PLATES.

## PLATE XX.

- Fig. 1.—*Cucullaea vaga* Iredale.  
 Fig. 2.—*Lopha hyotis notina* Iredale.  
 Fig. 3.—*Decatopecten strangei* Reeve.  
 Fig. 4.—*Eucrassatella genuina* Iredale.  
 Fig. 5.—*Batissa australis* Deshayes.  
 Fig. 6.—*Anomia descripta* Iredale.  
 Figs. 7, 7a.—*Monia deliciosa* Iredale.  
 Fig. 8.—*Regozara olivifer* Iredale.  
 Figs. 9, 9a.—*Pitarina osmunda* Iredale.  
 Fig. 10.—*Epicodakia kennethi* Iredale.  
 Fig. 11.—*Parataptes scordalus* Iredale.  
 Fig. 12.—*Acritopaphia transfusa* Iredale.  
 Fig. 13.—*Katelysia enigma* Iredale.  
 Fig. 14.—*Florisarka onuphria* Iredale.  
 Fig. 15.—*Ensiculus hilaris* Iredale.  
 Fig. 16.—*Glauconometta plankta* Iredale.  
 Fig. 17.—*Granitorium attonitum* Iredale.  
 Fig. 18.—*Tellinota roseola* Iredale.  
 Fig. 19.—*Flavomata biradiata* Wood.

## PLATE XXI.

- Fig. 1.—*Musculus cumingianus* Reeve.  
 Fig. 2.—*Borniola filosa* Hedley.  
 Fig. 3.—*Redicirce mistura* Iredale.  
 Fig. 4.—*Ambuscintilla praemium* Iredale.  
 Fig. 5.—*Redicirce consola* Iredale.  
 Fig. 6.—*Pristipagia gemonia* Iredale.  
 Fig. 7.—*Pingvimacoma hemicilla* Iredale.  
 Fig. 8.—*Milligareta venta* Iredale.  
 Figs. 9, 9a.—*Distugonia inopinata* Iredale.  
 Fig. 10.—*Musculus ulmus* Iredale.  
 Fig. 11.—*Minolops gertruda* Iredale.  
 Fig. 12.—*Benthastelena katherina* Iredale.  
 Fig. 13.—*Partubiola blancha* Iredale.  
 Fig. 14.—*Smaragdista tragensis* Iredale.  
 Fig. 15.—*Liotina scalaris* Hedley.  
 Fig. 16.—*Diffalaba opiniosa* Iredale.  
 Fig. 17.—*Ataxocerithium conturbatum* Iredale.  
 Fig. 18.—*Ataxocerithium scruposum* Iredale.  
 Fig. 19.—*Ataxocerithium applanum* Iredale.  
 Fig. 20.—*Gazameda decoramen* Iredale.  
 Fig. 21.—*Sirius meracus* Iredale.  
 Fig. 22.—*Halotapada nubila* Iredale.

## PLATE XXII.

- Fig. 1.—*Lamelliscala parspectiosa* Iredale.  
 Fig. 2.—*Mazescala thrasys* Iredale.  
 Fig. 3.—*Mazescala heloris* Iredale.  
 Fig. 4.—*Mazescala bellicosa* Hedley.  
 Fig. 5.—*Laeviscala tacita* Iredale.  
 Fig. 6.—*Acutiscala minoa* Iredale.  
 Fig. 7.—*Acutiscala ampacta* Iredale.  
 Fig. 8.—*Acutiscala fabia* Iredale.  
 Fig. 9.—*Acutiscala coreta* Iredale.  
 Fig. 10.—*Acutiscala christyi* Iredale.  
 Fig. 11.—*Limiscala helicornua* Iredale.  
 Fig. 12.—*Obstopalia lixa* Iredale.  
 Fig. 13.—*Folaceiscala carchedon* Iredale.  
 Fig. 14.—*Solvaclathrus jacobiscala* Iredale.  
 Fig. 15.—*Folaceiscala barissa* Iredale.  
 Fig. 16.—*Folaceiscala antisoa* Iredale.  
 Fig. 17.—*Folaceiscala pindasa* Iredale.  
 Fig. 18.—*Narvaliscala dorysa* Iredale.  
 Fig. 19.—*Murdochella macrina* Iredale.  
 Fig. 20.—*Dissopalialia turrisphari* Hedley.  
 Fig. 21.—*Plastiscala morchi* Angas.  
 Fig. 22.—*Plastiscala morchi profundior* Iredale.  
 Fig. 23.—*Plastiscala morchi bentha* Iredale.  
 Fig. 24.—*Pomiscala perpicata* Iredale.  
 Fig. 25.—*Dannevigena martyr* Iredale.  
 Fig. 26.—*Opalia australis* Lamarck.  
 Fig. 27.—*Nodiscala apostolorum* Iredale.  
 Fig. 28.—*Nodiscala fregata* Iredale.  
 Fig. 29.—*Scalaria distincta* Smith.  
 Fig. 30.—*Granuliscala ballinensis* Smith.

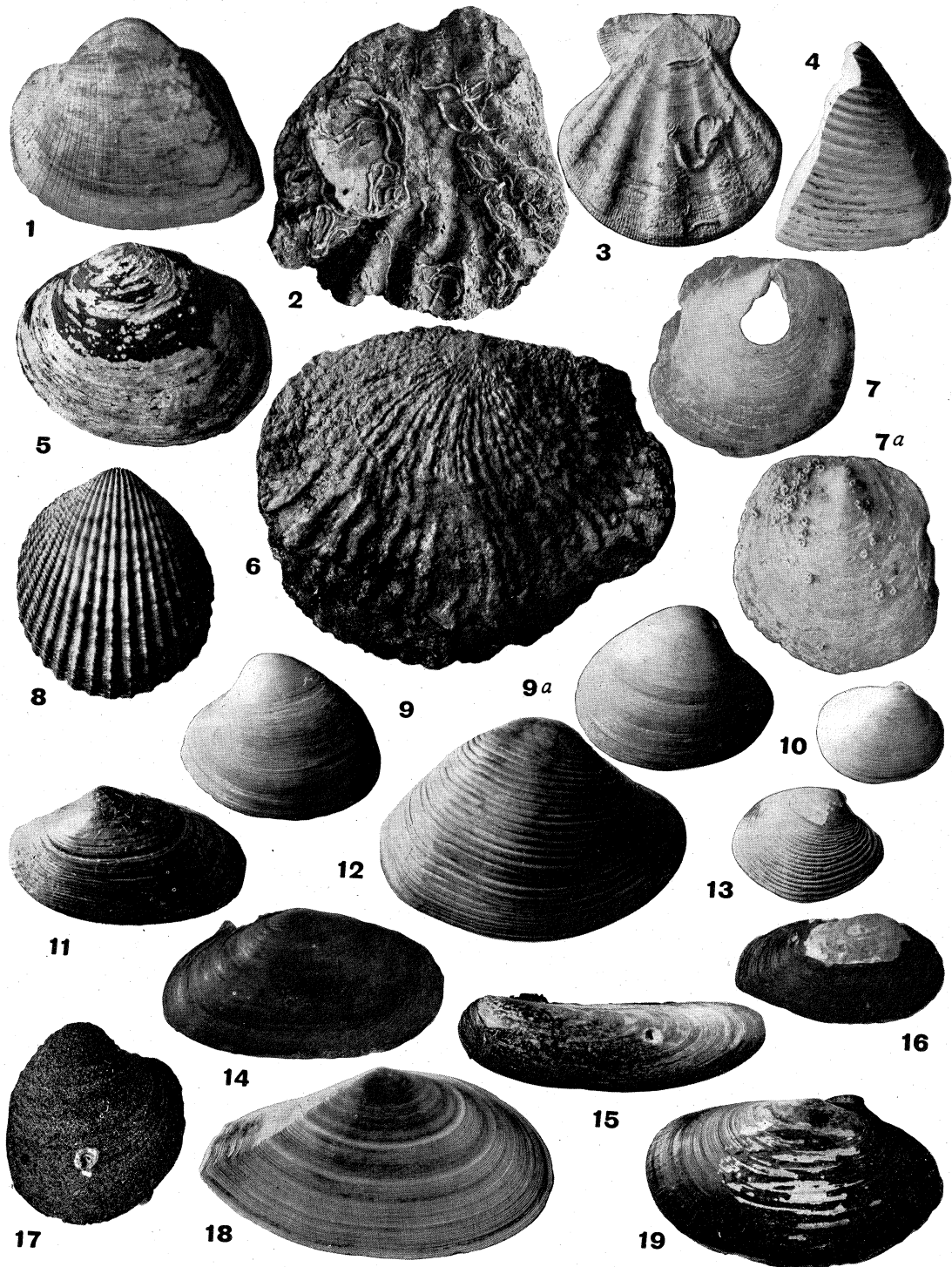
## PLATE XXIII.

- Fig. 1.—*Tritonocauda caudata vulticula* Iredale  
 Fig. 2.—*Ranularia sinensis defrenata* Iredale.  
 Fig. 3.—*Septa ? blacketi* Iredale.  
 Fig. 4.—*Phanozesta remensa* Iredale.

- Fig. 5.—*Colus genticus* Iredale.  
 Fig. 6.—*Sydaphera obnixa* Iredale.  
 Fig. 7.—*Benthindsia problematica* Iredale.  
 Fig. 8.—*Volva volva cumulata* Iredale.  
 Fig. 9.—*Ancillista velesiana* Iredale.  
 Fig. 10.—*Relegamoria molleri* Iredale.  
 Fig. 11.—*Pterochelus duffusi* Iredale.  
 Fig. 12.—*Torvamurex extraneus* Iredale.  
 Fig. 13.—*Torvamurex denudatus* Perry.  
 Fig. 14.—*Torvamurex denudatus immunitus* Iredale.  
 Fig. 15.—*Vicimitra contermina* Iredale.  
 Fig. 16.—*Vicimitra exposita* Iredale.  
 Fig. 17.—*Columbarium trabeatum* Iredale.  
 Fig. 18.—*Mammilla plumatilis* Iredale.  
 Fig. 19.—*Architectonica relata* Iredale.  
 Fig. 20.—*Architectonica perspectiva fressa* Iredale.

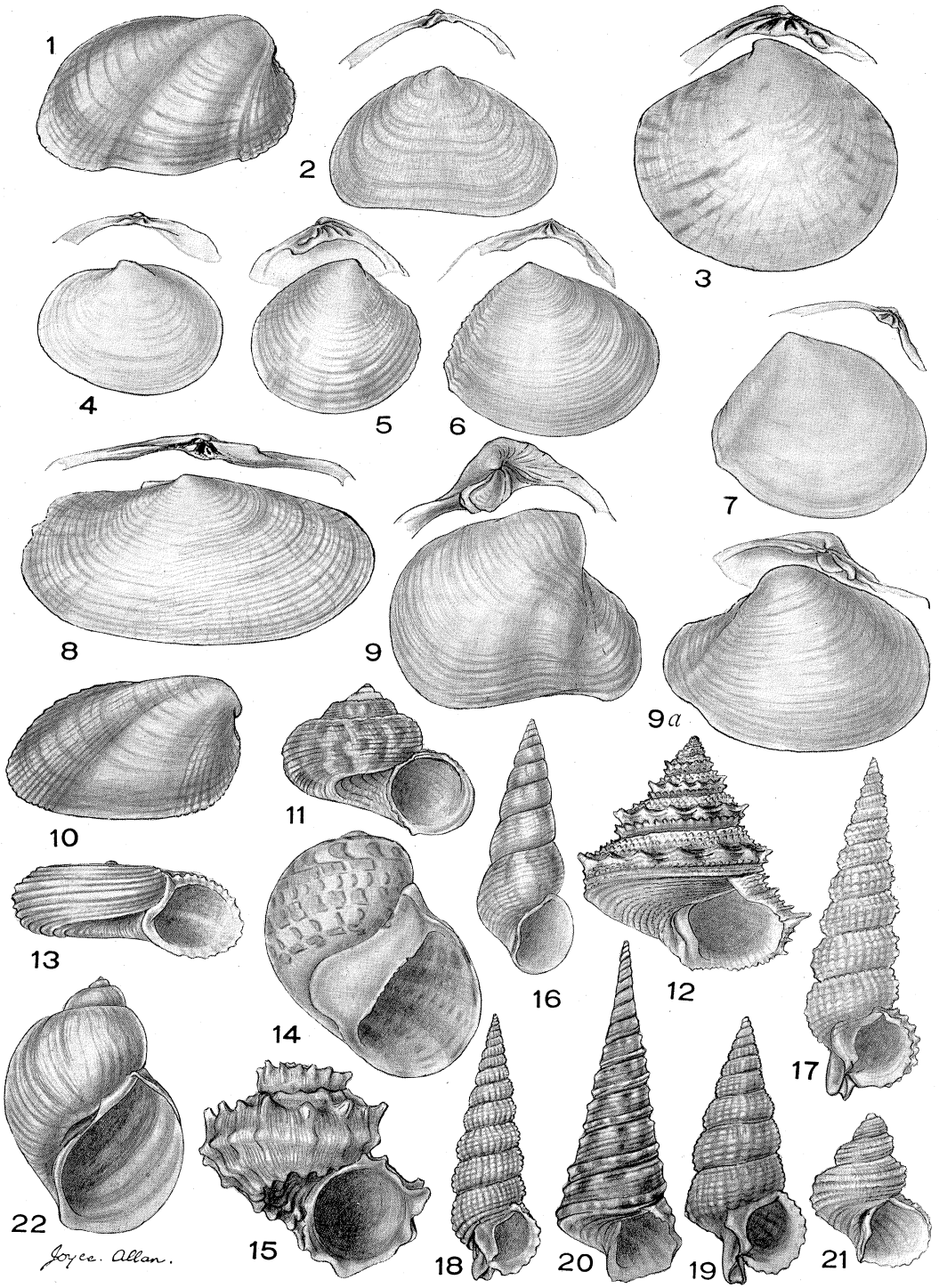
## PLATE XXIV.

- Fig. 1.—*Tropidorbis mendicus* Iredale.  
 Fig. 2.—*Cymatona kampyla* Watson; apical whorls.  
 Fig. 3.—*Apollon facetus* Iredale.  
 Fig. 4.—*Apollon deliberatus* Iredale.  
 Fig. 5.—*Phanozesta remensa* Iredale; apical whorls.  
 Fig. 6.—*Notocochlis cothurnata* Iredale.  
 Fig. 7.—*Notocochlis schoutanica diatheca* Iredale.  
 Fig. 8.—*Marseniopsis innominatus* Iredale.  
 Fig. 9.—*Arizelostoma laseroni* Iredale.  
 Fig. 10.—*Diminovula manifesta* Iredale.  
 Fig. 11.—*Niotha hawleyi* Iredale.  
 Fig. 12.—*Typhina pavlova* Iredale.  
 Fig. 13.—*Cyphonochelus generosus* Iredale.  
 Fig. 14.—*Colsyrnola decolorata* Iredale.  
 Fig. 15.—*Torinista popula* Iredale.  
 Fig. 16.—*Claraxis illustris* Iredale.  
 Fig. 17.—*Larinopsis ostensus* Iredale.  
 Figs. 18, 18a.—*Columbarium hedleyi* Iredale.  
 Fig. 19.—*Fractolaturus normalis* Iredale.  
 Fig. 20.—*Limulatys reliquus* Iredale.  
 Fig. 21.—*Ventomnestia colorata* Iredale.  
 Fig. 22.—*Melosidula granosula* Iredale.  
 Fig. 23.—*Pupa tragulata* Iredale.  
 Fig. 24.—*Pupa fumata* Reeve; medially smooth.  
 Fig. 25.—*Acteon subroseus* Iredale.  
 Fig. 26.—*Pupa fumata* Reeve; completely grooved.  
 Fig. 27.—*Acteon dolichoroseus* Iredale.  
 Fig. 28.—*Acteon fructuosus* Iredale.  
 Fig. 29.—*Pupa roseomaculata* Iredale.
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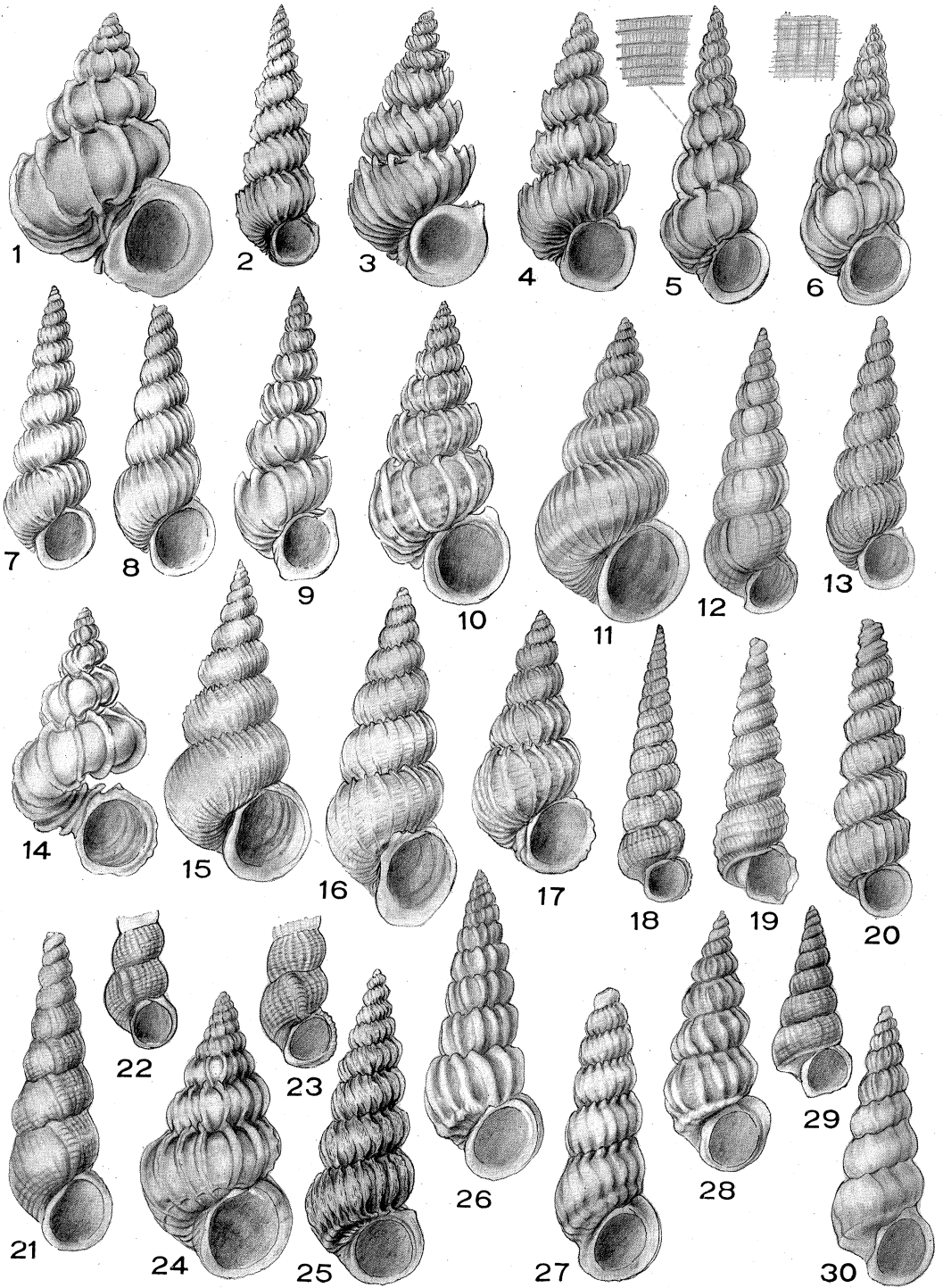


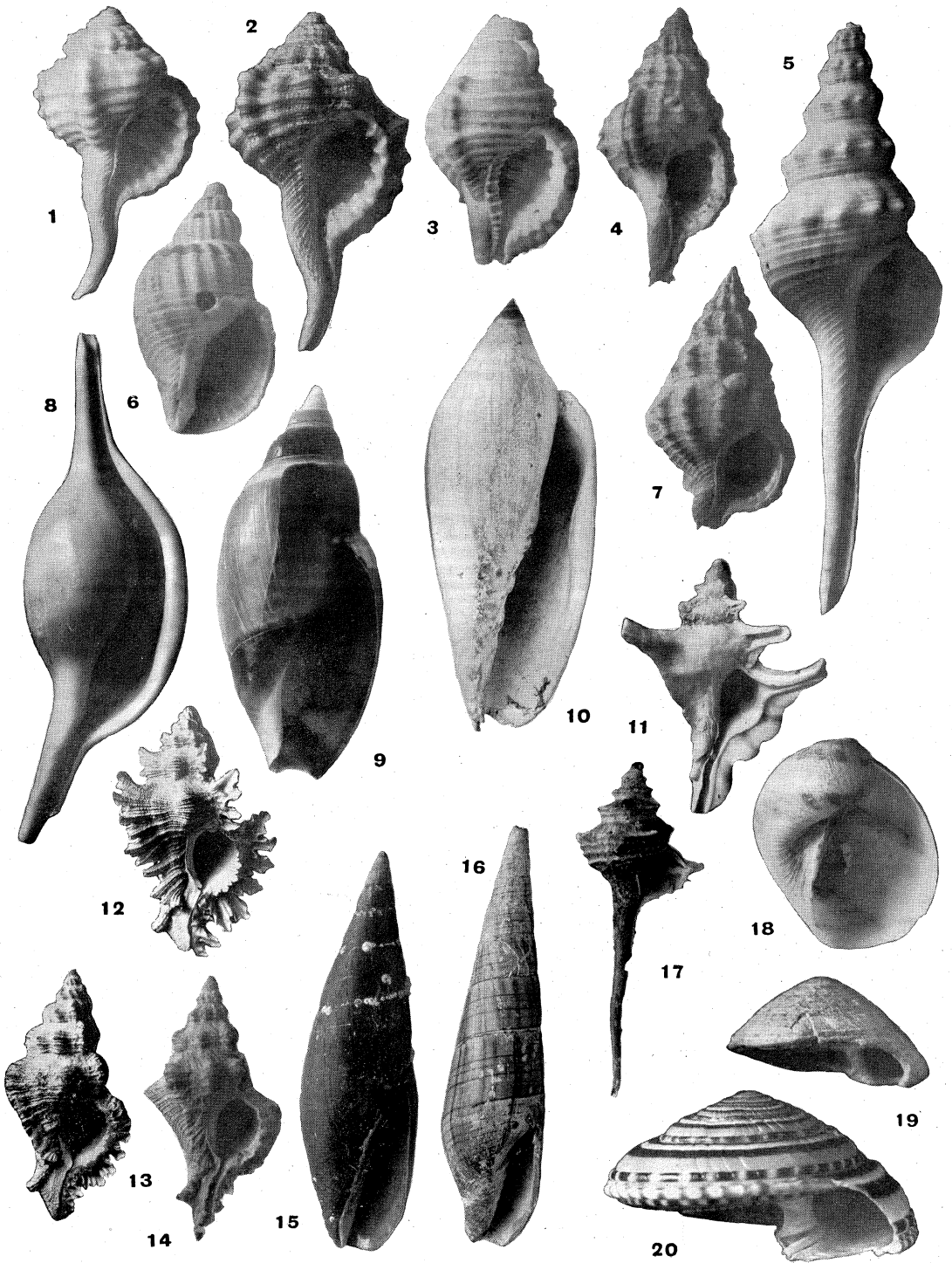
G. C. CLUTTON, photo.

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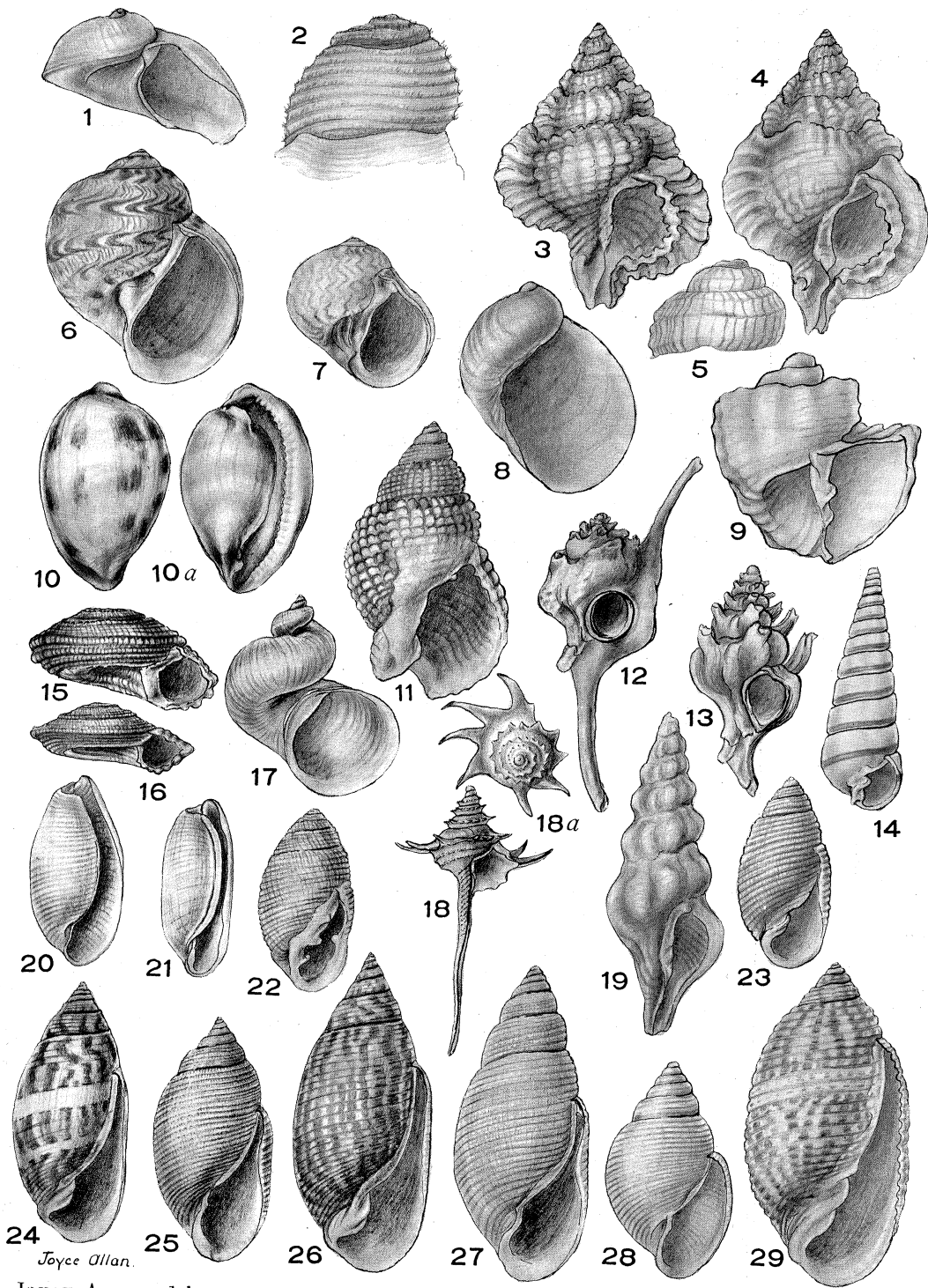


Joyce. Allan.  
JOYCE ALLAN, del.  
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