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A REVISION OF THE NEW SOUTH WALES LEPTONIDAE (MOLLUSCA: Pelecypoda)

(Figs. 1-27)

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INTRODUCTION.

The group of bivalves dealt with in this paper has been classified differently by Australasian conchologists. Hedley in his check list, 1918, used Leptonidae as a family name. Powell in "Shellfish of New Zealand", 1937, divided the group into two families Lasaeidae and Erycinidae. Cotton and Godfrey, "The Mollusca of South Australia", 1938, used Leptonacea as a superfamily, divided into two families, Leptonidae and Montacutidae. Powell again, in a second edition, 1946, reverted to the single family Leptonidae.

That arrangement is followed here. The group, whether considered as a family or superfamily, seems a natural one, and the characters, both anatomical and of the shell, are reasonably definable.

Many of the genera are nestling, others are reputed to be either commensal or parasitic, but the latter habits have not been noticed in any of the Peronian forms. Shell characters which may be noted are the small size, thin cellular crystalline texture, and generally fine concentric sculpture. The colour is mainly white or yellow. A thin periostracum may be present. They are equivalve, sometimes gaping, inequilateral, but often nearly equilateral, the posterior end sometimes longer than the anterior. The ligament is rarely external, and when present is weak, leaving no impression on the shell. The resilium is internal, generally in a subumbonal pit, but with no chondrophore. The hinge plate is narrow, with one or two cardinal teeth in each valve, or they may be quite missing in one valve; the cardinals in the other valve fitting into notches on either side of the resilium; laterals may be present, but are generally weak. The adductors are peripheral and subequal, and the pallial line is entire.

All the genera placed by Hedley in the Leptonidae are discussed in this paper with the exception of the minute genus *Notolepton* Finlay. There is considerable doubt as to the exact classification of *Notolepton*, and it is possible that, together with *Micropolia* Laseron, its affinities are with *Cyamiomactra* Bernard rather than with the Leptonidae. In any case I have already discussed both genera in an earlier paper (Laseron 1953).

There is also considerable doubt about the systematic position of *Benthoquetia* Iredale. Cotton placed it near *Montacuta* Turton, but both Hedley and Iredale referred the type species to the Myacidae.

In the preparation of this paper my thanks are again due to Mr. Tom Iredale for his generous advice and for checking the material in the Australian Museum at a time when my own ill health confined me to my home. All the types as well as specimens illustrated have been presented to the Australian Museum.

Genus **Marikellia** Iredale, 1936.

Type species, *Kellia solida* Angas.

Iredale (1936) pointed out that the type species of *Kellia* Turton, s.s., was really the common little gregarious shell known previously as *Lasaea* Brown, and that Kellia must replace *Lasaea* in nomenclature. He introduced *Marikellia* as a new generic name with *Kellia solida* Angas as the type species. Cotton and Godfrey (1938) supplied a full generic description of *Marikellia* from which the following characters may be emphasised: The smooth, white, more or less oval inflated inequilateral shell, the hinge with its internal ligament and wide resilifer, the left valve with a conical tooth in front and a lamelliform tooth anterior to that, a lamelliform tooth behind the resilifer, the right valve with a lamelliform tooth both in front and behind, the adductor scars subequal, the pallial line entire.

All the New South Wales species conform to this description and the genus appears to be a natural one with well marked limitations. It appears also to be restricted to shallow water, often living above the limits of low tide, both on the outer coast and within the harbour. A common habitat of several of the species is nestling within masses of the common hairy mussel, *Trichomya hirsuta* Lamarck, which grow on the foreshore reefs just above low tide level.

Marikellia rotunda (Deshayes).

(Figs. 1, 1*a*, 1*b*, 1*c*)

Erycina rotunda Deshayes, 1855, Proc. Zool. Soc. Lond., 181.

This species appears on the New South Wales List as *Kellia suborbicularis* Montagu, an English shell considered until recently to have a world wide range. Most present day conchologists, however, discount this view. The type locality of *M. rotunda* is Moreton Bay, the northernmost limit of the Peronian Province. Hedley (1905) having stated that Smith "has repeatedly expressed his conviction that *Erycina rotunda* Deshayes from Moreton Bay, Queensland, cannot be separated from *K. suborbicularis*", synonymized them (1917) under the latter species. Iredale (1936) preferred to adopt *E. rotunda* in connection with the genus *Marikellia*, a course here followed. Further examination shows that there are actually two forms under this name in New South Wales, one of which is here described as new. What is taken as the typical *M. rotunda* is a rounded shell, nearly as high as long, only moderately inflated, rather oblique, with the umbos well forward and pointing anteriorly. The anterior margin is somewhat flattened, this character varying somewhat, some specimens from the outer beaches having it nearly straight. The left valve has two prominent anterior teeth, the right valve only one, and each valve has the usual lamellar posterior tooth. The specimen figured was living in mussel beds, Balmoral, Port Jackson; its length is 11.7 mm; height 10.6 mm; and thickness of the united valves about 8 mm.

Marikellia jacksoniana (Smith).

(Figs. 2, 2*a*, 2*b*, 2*c*)

Kellia jacksoniana Smith, 1844, Zool. Coll. *Alert*, 105, pl. 7, fig. F.

This is the commonest New South Wales species. It is found chiefly within the harbours, being particularly abundant living in beds of the common mussel between tide marks in many parts of Port Jackson. The specimen figured came from North Harbour and is 13 mm long, 9 mm high and the thickness of the united valves about 7 mm. Compared with *M. solida* the shell is thinner, with a yellow tinge when alive, the growth lines are more apparent, the umbos are smaller and more anteriorly placed, the height is greater compared to the length, and it is less inflated.

Marikellia solida (Angas).

(Figs. 3, 3*a*, 3*b*, 3*c*)

Kellia solida Angas, 1877, Proc. Zool. Soc. Lond., 176, pl. 26, fig. 25.

This is a common species, distinguished by its solid, smooth, porcellaneous, polished shell, regular oval shape, elongated, with sub-central inflated umbos. It is generally found on the outer beaches right along the coast, the length of the isolated valves generally about 8 or 9 mm. The specimen figured is larger than usual and was found alive in beds of the common mussel in North Harbour, Port Jackson. Its length is 12 mm; height 9.4 mm; and the thickness of the united valves about 8mm. A feature of this specimen is the minute, perfectly round prodissoconch, still visible on the tip of the overhanging umbo.

Marikellia tumida sp. nov.

(Figs. 4, 4*a*, 4*b*, 4*c*)

Shell comparatively large, rotund, as high as long, slightly oblique, umbos very large and tumid, not so far forward as in *M. rotunda*, apices overhanging the hinge and twisted forwards. Colour white with a yellowish tinge, surface shiny, texture sub-translucent, concentric growth lines fine and prominent. Adductor muscle scars and pallial line very faintly impressed and hardly visible. Left valve with a sharp, projecting isolated conical tooth just in front of the umbo, and anterior to this a larger, less projecting tooth attached to the hinge plate. The posterior lamellar tooth is narrow and not prominent. Right valve with one prominent anterior tooth, and a prominent narrow, transverse posterior tooth, above which is a transverse deep slot for the reception of the corresponding tooth on the other valve. Length 13.2 mm; height 13 mm; thickness of united valves about 9 mm.

Locality.—Living in mussel beds, Shark Island, Port Jackson (type); on beach at Point Halliday, North Coast.

Remarks.—This species is closely related to *M. rotunda*, from which it can, however, be readily separated by its huge, tumid umbos, and its greater height in relation to its length. It is not quite so oblique, and the anterior margin is rounded not flattened.

Marikellia adamsi (Angas).

(Figs. 5, 5*a*, 5*b*, 5*c*)

Lepton adamsi Angas, 1867, Proc. Zool. Soc. Lond., 910, pl. 44, fig. 11.

This is an oval shell, thin, white and lustrous, with barely discernible growth lines, and the least inflated of all the local species. The umbos are comparatively small and sharp and placed about one-third from the anterior end. The hinge plate and teeth are small, but conform otherwise to the generic characters. It is not uncommon on the outer beaches, but so far we have not found it alive. The specimen figured is from Manly Ocean Beach, Sydney, is 14.5 mm long, 11 mm high and the thickness of the united valves is about 5.6 mm.

Genus **Fronsella** gen. nov.

Type species, *Fronsella adipata* sp. nov.

Like *Marikellia* in general form, but less inflated, and with the anterior end longer than the posterior. Hinge plate narrow; a small anterior conical tooth and a lamellar posterior tooth in each valve with the wide resilifer between. The prolongation of the anterior end at once separates this from *Marikellia* and gives it quite a different facies.

Fronsella adipata sp. nov.

(Figs. 6, 6*a*, 6*b*)

Shell of medium size, yellowish white, thin, polished, regularly oval, not greatly inflated, umbos about one-third from the posterior end, shell greatly produced in front. Umbos comparatively small and sharp, erect. All margins rounded. Growth lines faint, surface nearly smooth and shining. Adductor muscles distinct, the anterior the larger, pallial line not close to margin. Prodissoconch comparatively large, round and raised. Hinge as in generic description. Length 8 mm; height 5.4 mm; depth of single valve about 1.5 mm.

Locality.—Dredged in Gunnamatta Bay, Port Hacking, south of Sydney, one left valve.

Remarks.—By its hinge resembles *Marikellia*, but differs from all local species of that genus by the posterior position of the umbos and the great extension of the anterior end. The comparatively flat shell, small umbos and the outline recall *M. adamsi*, but the umbos well to the rear of course at once separate it.

Fronsella reversa sp. nov.

(Figs. 7, 7*a*)

Shell of medium size, oval, white, thin and translucent, the muscle scars visible from the exterior of the shell. Umbo not inflated, about one-third from the posterior end, pointing forwards. All margins rounded, but the anterior end slightly tapered, and with the surface of the shell slightly angled anteriorly. Hinge of right valve with a wide, very narrow subumbonal resilifer, with a small tooth in front and a lamellar lateral tooth behind. Adductor scars subequal, pallial line not close to margin. Length 7 mm; height 5 mm; depth of single valve approximately 1.4 mm.

Locality.—6 fathoms, North Harbour, Port Jackson.

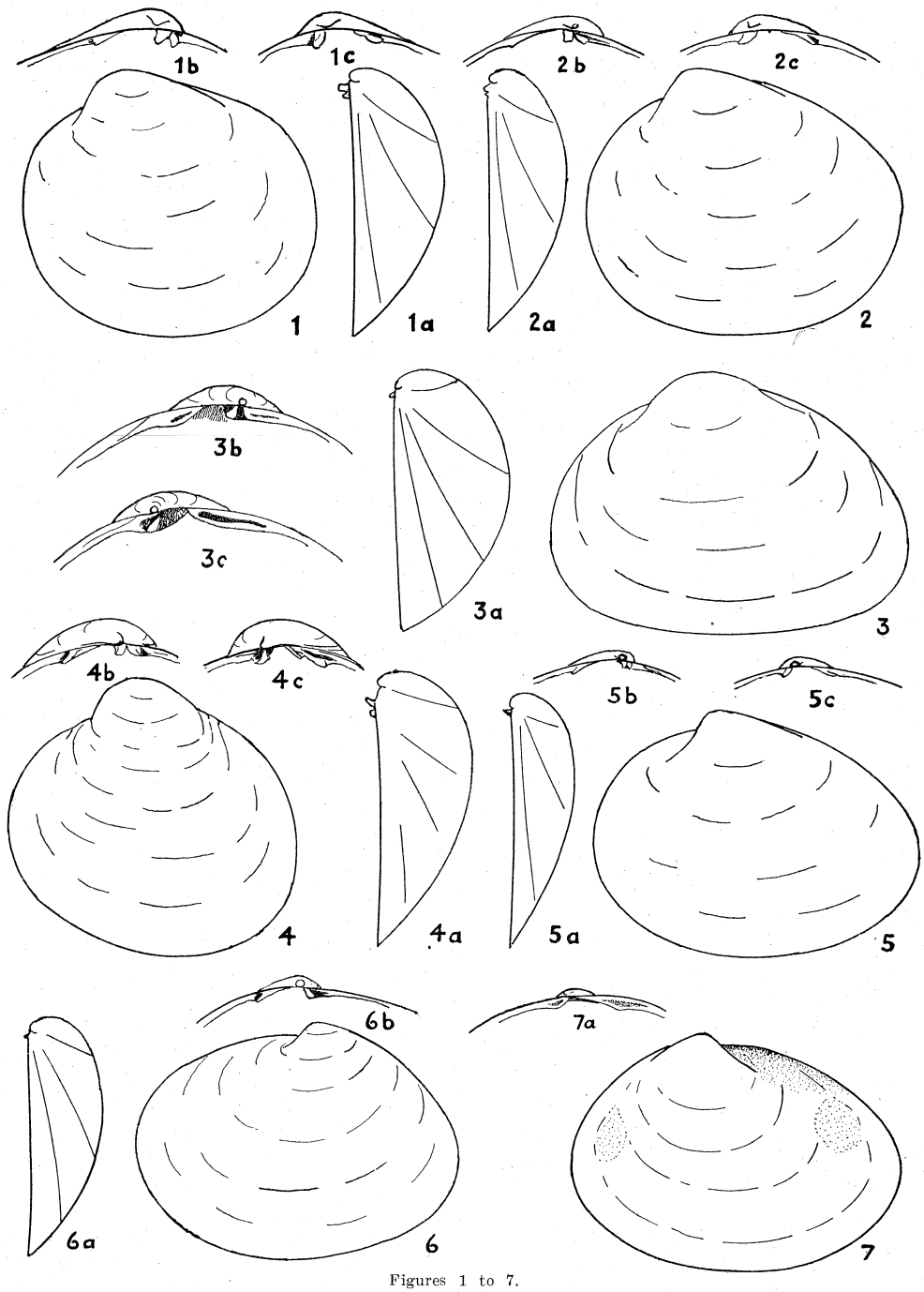
Remarks.—This is very close to *F. adipata*, but differs in outline, the umbos are rather finer, the shell is slightly keeled and is thinner, with the adductor muscles visible from the exterior.

Genus **Parvikellia** gen. nov.

Type species, *Parvikellia isolata* sp. nov.

Like *Marikellia* with an oval, thin, white highly polished and inflated shell, sculpture confined to faint, concentric growth lines, but with a weaker hinge and small erect, nearly central umbos. The right valve is the only one known, and this has a subumbonal triangular resilifer, in front of which is a single cardinal tooth bearing a slight hook, and behind one fairly prominent lateral. Adductor scars and pallial line not impressed. A second species, described here as *P. depressa*, is known from the left valve only, and if this is congeneric, it completes the picture of the hinge, showing that the left valve has two small cardinals and two laterals.

Parvikellia is one of many small white shells with superficial resemblance which previous authors have been content to place in either *Lepton* Turton or *Montacuta*, apparently because they would not fit in elsewhere. Actually it is doubtful if either of these north Atlantic genera occurs in Australian waters, and the result has been to confuse many quite different generic types. Cotton and Godfrey have used both *Lepton* and *Montacuta* for South Australian shells, but by the descriptions given all need further revision and division generically. Of these *Montacuta meridionalis* Tate is I think definitely congeneric with *Parvikellia*.



Figures 1 to 7.

1, *Marikellia rotunda* Deshayes, left valve (1*a*, profile; 1*b*, 1*c*, hinge); 2, *Marikellia jacksoniana* Smith, left valve (2*a*, profile; 2*b*, 2*c*, hinge); 3, *Marikellia solida* Angas, left valve, (3*a*, profile; 3*b*, 3*c*, hinge); 4, *Marikellia tumida* Laseron, left valve (4*a*, profile; 4*b*, 4*c*, hinge); 5, *Marikellia adamsi* Angas, left valve (5*a*, profile; 5*b*, 5*c*, hinge); 6, *Fronsella adipata* Laseron, left valve (6*a*, profile; 6*b*, hinge); 7, *Fronsella reversa* Laseron, right valve (7*a*, hinge).

Parvikellia isolata sp. nov.

(Figs. 8, 8*a*)

Shell broadly oval, nearly equilateral, thin, white, highly polished, somewhat inflated. Margins all regularly rounded. Umbo small, sharp and erect, nearly centrally situated, with a small, distinct rounded prodissoconch. Hinge of right valve with a small triangular subumbonal resilifer, in front of which is a single, conical cardinal tooth, bearing a slight hook at its distal end. No anterior but a single posterior lateral tooth. Adductor scars and pallial line not impressed. Length 6.2 mm; height 5 mm; depth of single valve 1.5 mm approximately.

Locality.—Burrill Lake, two right valves.

Remarks.—This agrees somewhat with the drawing of *Montacuta angasi* Smith, described from a single right valve from Port Jackson, but cannot be reconciled with the description which states the hinge to have two divergent lateral teeth with a triangular space between, and also to have the muscle scars deeply impressed. The general facies is that of a *Marikellia* but it differs from all species of that genus by the small erect centrally situated umbos.

Parvikellia depressa sp. nov.

(Figs. 9, 9*a*)

Shell small, oval, nearly equilateral, thin, glassy and translucent, with traces of a thin brownish periostracum. Umbos nearly central, small and erect. All the margins rounded, but the posterior end rather longer and narrower than the anterior and the ventral margin slightly expanded at about its posterior third. Sculpture of very fine concentric growth lines. Only the left valve known, of which the hinge has a triangular resilifer below the umbo, with two small diverging cardinal teeth and two lateral teeth. The latter, as in *Mysella* Angas, are apparently the thickened edges of the infolded dorsal margin. Adductor scars and pallial line not impressed. Length 5.5 mm; height 4 mm; and depth of single valve approximately 1 mm.

Locality.—5 fathoms, Jervis Bay, N.S.W., two left valves.

Remarks.—This in outline is close to *P. isolata* but differs in details. It is lower in proportion to its length, is flatter, and is thinner and not so highly polished. The hinge cannot be compared, as the types of both species are of opposite valves, and they may not even be congeneric, but complete material is necessary to determine this question.

Genus **Pileatona** gen. nov.

Type species, *Pileatona compressa* sp. nov.

Shell small, thin, trigonal, nearly equilateral, sculpture of concentric growth lines only. Hinge weak, the only valve known (the left ?) with a narrow resilifer and two obscure laterals. Prodissoconch rounded and distinct. Adductor muscle scars and pallial line not impressed.

The weak hinge and thin shell separate this from *Kellia* and the trigonal shape from all other members of the family. The South Australian *Lepton trigonale* Tate may also belong here.

Pileatona compressa sp. nov.

(Figs. 10, 10*a*)

Shell small, thin, yellowish, translucent, trigonal, nearly equilateral, the left (?) valve only known, ventral margin rounded, anterior and posterior margins straighter, converging towards the umbo, dorsal margin short, but flattened behind the umbo. Umbo nearly erect, with a prominent prodissoconch, nearly centrally situated. Sculpture of fine concentric growth lines. Hinge of left valve weak, with a narrow subumbonal resilifer, hinge plate narrow, with two obscure laterals. Length 4.6 mm; height 4 mm; depth of single valve approximately 1.5 mm.

Locality.—40-50 fathoms off Twofold Bay.

Remarks.—As this species is different in form from any other recorded from southern Australian seas I have ventured to propose a new genus and species from a single left valve which may not even be quite mature. Its distinctive characters, however, should make its future recognition comparatively easy.

Genus **Coriareus** Hedley, 1907.

Type species, *Coriareus vitreus* Hedley.

Hedley's description reads: "A genus allied to *Lasaea*, (*i.e.*, *Kellia*), with a weaker, less complex hinge, a larger, thinner, radiately sculptured valve clothed with a thick dense epidermis; second species, *Montacuta semiradiata* Tate."

Coriareus vitreus Hedley.

(Figs. 11*a*, 11*b*; after Hedley)

Coriareus vitreus Hedley, 1907, Rec. Aust. Mus. vi, 301, pl. 56, figs. 28, 30.

The type locality is 80 fathoms off Narrabeen, north of Sydney, and Hedley also records it from 300 fathoms off Sydney, the dimensions of the type being given as length 6.5 mm; height 5 mm; and depth of single valve 1.5 mm.

I have not seen this species, but the full description given, and particularly the radial sculpture and thick epidermis, should make it easy to recognize.

Coriareus jervisensis sp. nov.

(Figs. 12, 12*a*)

Shell white, thin, translucent, regularly oval, with what appear to be traces of an amorphous epidermis. Nearly equilateral, the umbo small and erect, slightly pointing forward, the anterior (?) end slightly longer than the posterior. Margins regularly rounded but the anterior end slightly higher than the posterior. Sculpture of fine growth lines, crossed medially by fine radial threads, closely spaced and becoming obsolete towards the ventral margin. Hinge of right valve with a single small subumbonal cardinal tooth, behind which is a narrow, channelled resilifer, and in front a broad lateral tooth. Hinge of left valve unknown. Adductor muscle scars and pallial line not impressed. Length 7.1 mm; height 5.5 mm; and depth of single valve 1.2 mm approximately.

Locality.—15 fathoms, Jervis Bay, N.S.W., sandy bottom.

Remarks.—This may possibly be the species recorded by Hedley (1907) as *Coriareus semiradiatus* (Tate) as associated with *C. vitreus* from 300 fathoms off Sydney. It is doubtful if the true *C. semiradiatus* occurs in New South Wales, and its acceptance on the Peronian list should be held in abeyance. This species is certainly not *C. semiradiatus*, from which it differs both in shape and sculpture. Its position in *Coriareus* is tentative, and when the hinge of the left valve is known it may need further generic revision.

Genus **Mylitta** d'Orbigny & Récluz, 1850.

Type species, *Mylitta deshayesi* d'Orbigny & Récluz.

Shell small, equivalve, nearly equilateral, nearly circular, almost as high as long, sculpture distinctive, of strong divaricate ribs, adductor scars large, pallial line simple. Hinge with a strong resilium in each valve, left valve with a prominent lamelliform posterior tooth and two small conical cardinal teeth beneath the umbo, right valve with a strong posterior lamelliform tooth and a single, small, subumbonal tooth.

Mylitta is a well defined genus typical of southern Australia, and is also found fossil in the Tertiary (Miocene) of Victoria and South Australia. The nearly circular form and distinctive sculpture make it easily recognizable.

Mylitta tasmanica (Ten. Woods).

(Figs. 13, 13*a*, 13*b*)

Pythina tasmanica Ten. Woods, 1875. Proc. Roy. Soc. Tasm., 162.

The type locality is King Island, and the species has been recorded from New South Wales and Tasmania to Fremantle. There seems little difference between figures published from Tasmania and South Australia, and the New South Wales specimens correspond sufficiently to confirm this wide range. It is not uncommon in shell sand from the ocean beaches, and its distinctive sculpture makes it easy of recognition. The specimen illustrated came from Port Stephens. Its length is 5.8 mm; height 5.2 mm; and depth of one valve approximately 1.5 mm.

Mylitta calva sp. nov.

(Figs. 14, 14*a*)

Shell small, sub-circular, nearly symmetrical, nearly as high as long, white, translucent. Umbos tumid, pointing slightly forward. Sculpture of short, very stout, divaricate ribs, beginning abruptly on both the anterior and posterior sides and continuing to the margins, the interstices crossed by well defined concentric threads, six main ribs on either side with fainter ribs both above and below, about 24 in all, the median portion of the shell from the umbo to the ventral margin smooth and polished. Hinge as in *M. tasmanica;* in the left

valve is a very prominent oblique posterior tooth with two small conical teeth beneath the umbo. Hinge of right valve unknown but probably as in *M. tasmanica*. Length of type 5 mm; height 4.5 mm; and depth of single valve about 1 mm.

Localities.—Shell sand, Port Stephens (type); Manly Beach, Sydney.

Remarks.—In general form and hinge this is practically the same as *M. tasmanica*, but it can be readily separated by the sculpture, the fewer and coarser ribs and smooth central area being constant and characteristic.

Genus **Melliteryx** Iredale, 1924.

Type species, *Erycina acupuncta* Hedley.

Iredale established and introduced *Melliteryx* on the grounds that Lamarck's genus *Erycina* was of uncertain status even for European shells and certainly could not be used for Australian recent molluscs. Cotton and Godfrey (1938) provided a generic description, the main characters being a small, inflated, oval to oblong shell, anterior end slightly longer, tumid umbos, one cardinal and a posterior and anterior lateral tooth in each valve. The surface of the shell is to the eye nearly smooth, but under strong magnification is seen to be punctate, the punctures arranged in curved oblique lines like the surface of a thimble.

Melliteryx acupuncta (Hedley).

(Figs. 15, 15*a*, 15*b*, 15*c*, after Hedley)

Erycina acupuncta Hedley, 1902. Aust. Mus. Mem. iv: 321, fig. 60.

The type locality is 41-50 fathoms off Cape Three Points, north of Sydney, the dimensions given length 2.1 mm; height 1.25 mm. I have not seen this species, but Hedley's excellent figures and description should make it easy to recognize.

Melliteryx helmsi (Hedley).

(Figs. 16, 16*a*, 16*b*)

Erycina helmsi Hedley 1915. Proc. Linn. Soc. N.S.W., xxxix., 701, pl. 80, figs. 37-9.

The type locality is in *Zostera* beds, Deewhy Lagoon, near Sydney, the dimensions given being, length 2.5 mm; height 2.1 mm; depth of single valve .8 mm. The specimen illustrated is from reclamations at Bayview (Pittwater) north of Sydney, its length 1.8 mm, height 1.5 mm, and depth of one valve about .5 mm. Specimens from Burrill Lake are probably more mature and approximate in size to the type. The very solid shell and general purple coloration should make this species easy to recognize.

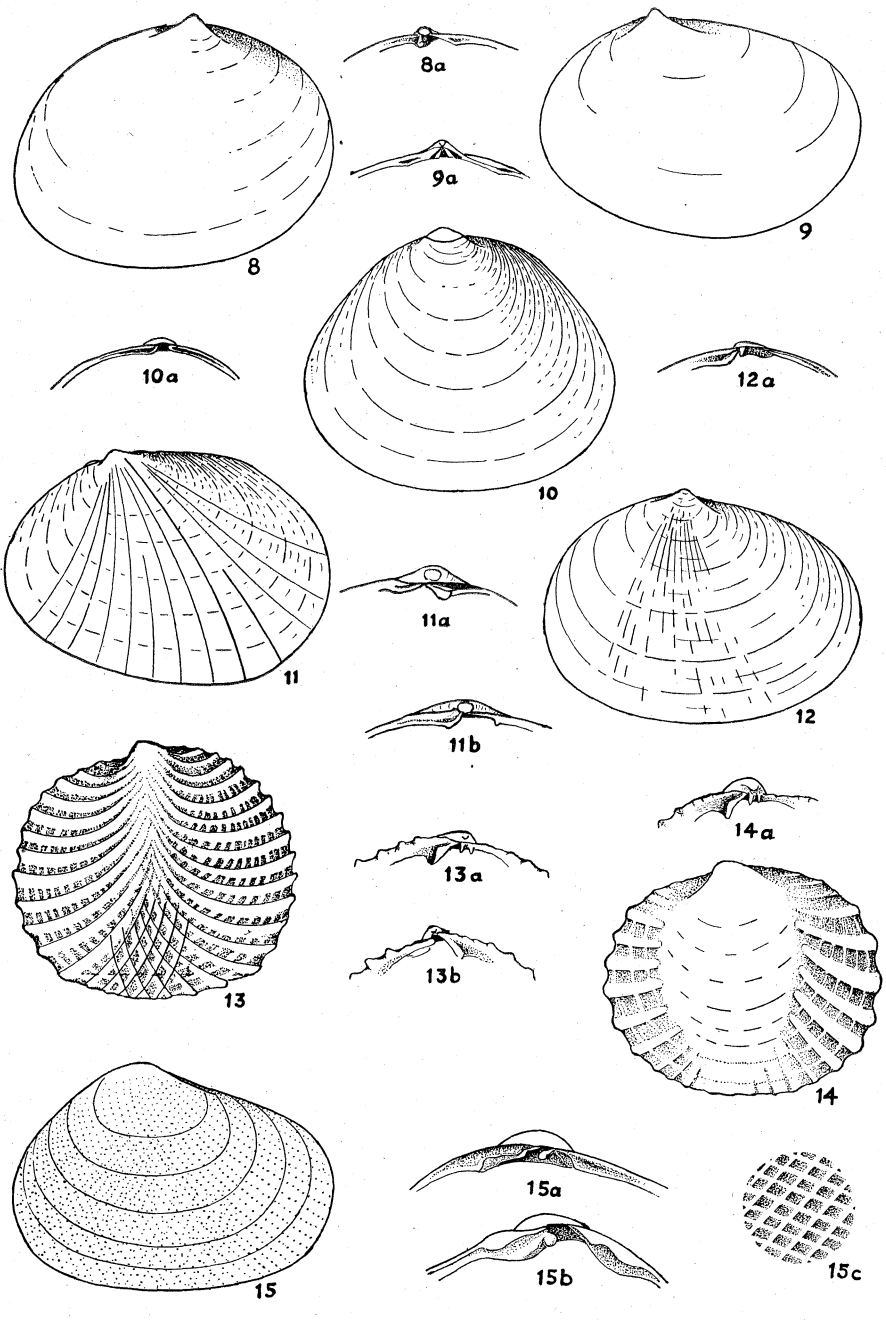
This is an estuarine species, and its known distribution suggests it will be found in other of the coastal lagoons. Its generic position is not quite certain. Hedley states that the external surface is punctate as in *Melliteryx*, but microscopic examination shows that it is rather pustulate, the minute pustules being lunate and arranged with their longer axes concentric and not in oblique lines. The hinge plate is large but the disposition of the teeth is as in *Melliteryx* where it may be provisionally retained.

Genus **Vermitexta** gen. nov.

Type species, *Vermitexta garrardi* sp. nov.

Shell small, equivalve, nearly equilateral, the anterior side slightly the longer, moderately inflated, thin, translucent, sculpture of faint growth lines, the surface otherwise to the eye nearly smooth. Under strong magnification, however, it is seen to be covered with minute, short, broken corrugations, their longer axes arranged radially. Ligament small and internal, the small resilifer subumbonal. Left valve with a small cardinal and two laterals, the right valve with two strong laterals only.

In general form this is near *Melliteryx*, and it has nearly the same type of hinge, but the minute corrugations, instead of a punctate surface, at once separate it.



Figures 8 to 15.

8, *Parvikellia isolata* Laseron, right valve (8*a*, hinge); 9, *Parvikellia depressa* Laseron, left valve (9*a*, hinge); 10, *Pileatona compressa* Laseron, left (?) valve (10*a*, hinge); 11, *Coriareus vitreus* Hedley (after Hedley), left valve (11*a*, 11*b*, hinge); 12, *Coriareus jervisensis* Laseron, left valve (12*a*, hinge); 13, *Mylitta tasmanica* d'Orbigny & Récluz, left valve (13a, 13b, hinge); 14, *Mylitta calva* Laseron, left valve (14*a*, hinge); 15, *Melliteryx acupuncta* Hedley (after Hedley) left valve (15*a*, 15*b*, hinge; 15*c*, surface magnified).

Vermitexta garrardi sp. nov.
(Figs. 17, 17*a*, 17*b*, 17*c*)

Shell small, thin, translucent, with traces of a yellow periostracum, moderately inflated, nearly equilateral, the anterior end slightly the longer, white. Sculpture of faint growth lines; surface under moderate magnification matt, but under higher power minute, closely packed, short and broken corrugations are visible, their longer axes radially arranged. Umbos obtuse and erect. Left valve with a short subumbonal cardinal, and two prominent laterals, right valve with two laterals only. Resilifer small. Adductor muscle scars small, pyriform and subequal, and with the pallial line visible through the shell. Length 4 mm; height 3 mm; depth of united valves approximately 2 mm.

Localities.—Twofold Bay (type collected by Mr. T. Garrard); North Harbour, Port Jackson; a number of specimens dredged on a sandy mud bottom.

Remarks.—In general form not unlike *Melliteryx acupuncta* but differing mainly in the texture of the shell.

Genus **Cicatellia** gen. nov.

Type species, *Cicatellia indenta* sp. nov.

Shell small, white, oval, equivalve, umbos large and inflated, nearly centrally situated, pointing forward. Surface shining but microscopically wrinkled. Left valve, the only one known, with a small centrally situated conical tooth, and two faint laterals. Prodissoconch small, rounded and protuberant.

This is one of the odd Peronian shells which will not fit any of the known genera. The faintly wrinkled surface suggests some relationship with *Vermitexta*, which also has a somewhat similar hinge, but the large tumid umbos and general form are quite distinct.

Cicatella indenta sp. nov.
(Figs. 18, 18*a*)

Shell small, white, thin, translucent, shining, but with the surface under the microscope faintly wrinkled, oval, somewhat inflated, nearly equilateral. Umbos large and tumid, nearly centrally situated, pointing forward, with a distinct, rounded dome-shaped prodissoconch, medially indented, the indentation fading towards the ventral margin. Dorsal, anterior and posterior margins rounded. Hinge of the left valve with a small conical tooth immediately below the umbo, and two faint laterals. Resilifer small. Pallial line and adductors not impressed. Length 4.2 mm; height 3.3 mm; depth of single valve approximately .9 mm.

Locality.—Shell sand, Port Stephens, 3 specimens of left valves.

Remarks.—There is no other species on the coast with which this can readily be confused, though in general form it resembles the juveniles of some species of *Marikellia.*

Genus **Kellia** Turton, 1822.

Type species, *Kellia rubra* Montagu.

Kellia replaces *Lasaea* for the common Australian species previously known as *Lasaea australis* (Lamarck) as apparently *Lasaea* is an absolute synonym of *Kellia* with the same type species (see Iredale, 1936).

Kellia is a distinctive genus with a nearly rotund shell, thick and solid, with strong lateral teeth but no cardinals. The sculpture is concentric, sometimes consisting of strong ribs. Nesting in habit and adhering by a byssus.

Kellia australis (Lamarck).
(Figs. 19, 19*a*, 19*b*)

Cyclas australis Lamarck, 1818, Anim. sans vert., v., 560.

The type locality is generally regarded as King George's Sound, Western Australia. There is still doubt as to whether the eastern Australian species is identical, or whether more than one species occurs in the one locality. There is considerable variation in the New South Wales specimens, but after examining long series from various localities, it seems that this is individual and neither racial nor specific. The chief variation is in the sculpture which typically consists of strong concentric, equally spaced ribs, but some specimens are nearly smooth near the umbos and others towards the ventral margin. The commonest habitat in New South Wales is within *Galiolaria* tubes, where it is invariably found nesting in countless numbers, but it is also found alive in dead oyster shells or in crevices in rocks. The specimen illustrated came from *Galiolaria* tubes in North Harbour, Port Jackson, its length being 6.5 mm; height 6 mm; and depth of united valves approximately 4.5 mm. A useful recognition point is the red colouration of the hinge area internally.

Genus **Borniola** Iredale, 1924.

Type species, *Bornia lepida* Hedley.

Iredale states that *Bornia* of Philippi is of very uncertain status even for European shells, and established *Borniola* in its stead for certain Australian bivalves. No generic description has previously appeared, but the salient characters may be defined as follows: Shell small to medium, flat, inequilateral to nearly equilateral, umbos small and erect, sculpture of growth lines crossed by very fine radial threads. Ligament internal, subumbonal, the resilifer triangular and well defined, flanked in the left valve by two diverging cardinal teeth. Right valve without teeth, the cardinals of the left valve fitting into shelf-like recesses in the sides of the resilifer.

The mechanics of the hinge are similar to that of *Mysella* but there are two cardinal teeth in the left valve instead of one, and the fine radial sculpture is distinctive.

Borniola lepida (Hedley).

(Figs. 20, 20*a*, 20*b*)

Bornia lepida Hedley, 1906, Proc. Linn. Soc. N.S.W., xxx., 543, pl. 32, figs. 22, 23.

The type locality is Manly Beach, Sydney, and it is not uncommon in shell sand on other beaches on the coast of N.S.W., also in dredgings within Port Jackson. The specimen figured came from 14 fathoms off Long Reef, north of Sydney, its length 6.5 mm; height 4.5 mm; and the depth of one valve approximately 1 mm. The nearly symmetrical shell and fine radial sculpture make it easy of recognition.

Borniola filosa (Hedley).

(Figs. 21, 21*a*).

Bornia filosa Hedley, 1903, Proc. Linn. Soc. N.S.W., xxvii., 7, pl. 2, figs. 15-17.

The type was a single left (?) valve from Middle Harbour, Port Jackson, and was probably not mature, its length being only 6 mm. It is seldom taken; I have so far seen only one other specimen—the same valve from reclamations at The Spit, Middle Harbour. This is much larger, its length 15 mm; height 10 mm; and the depth 1.5 mm. It can be readily distinguished from *B. lepida* by the much more asymmetrical shell.

Borniola radiata (Hedley).

(Figs. 22, 22*a*, 22*b*, after Hedley)

Bornia radiata Hedley, 1905. Rec. Aust. Mus. vi, 48, fig. 12.

The type locality is 111 fathoms east of Cape Byron, the dimensions given being height 4.6 mm; length 6 mm; and depth of single valve 1.25 mm. I have not seen this species, but in form it is intermediate between *B. lepida* and *B. filosa*. Hedley figures but does not describe the hinge, and by his figure the left valve has only one and not two cardinal teeth as in the other species.

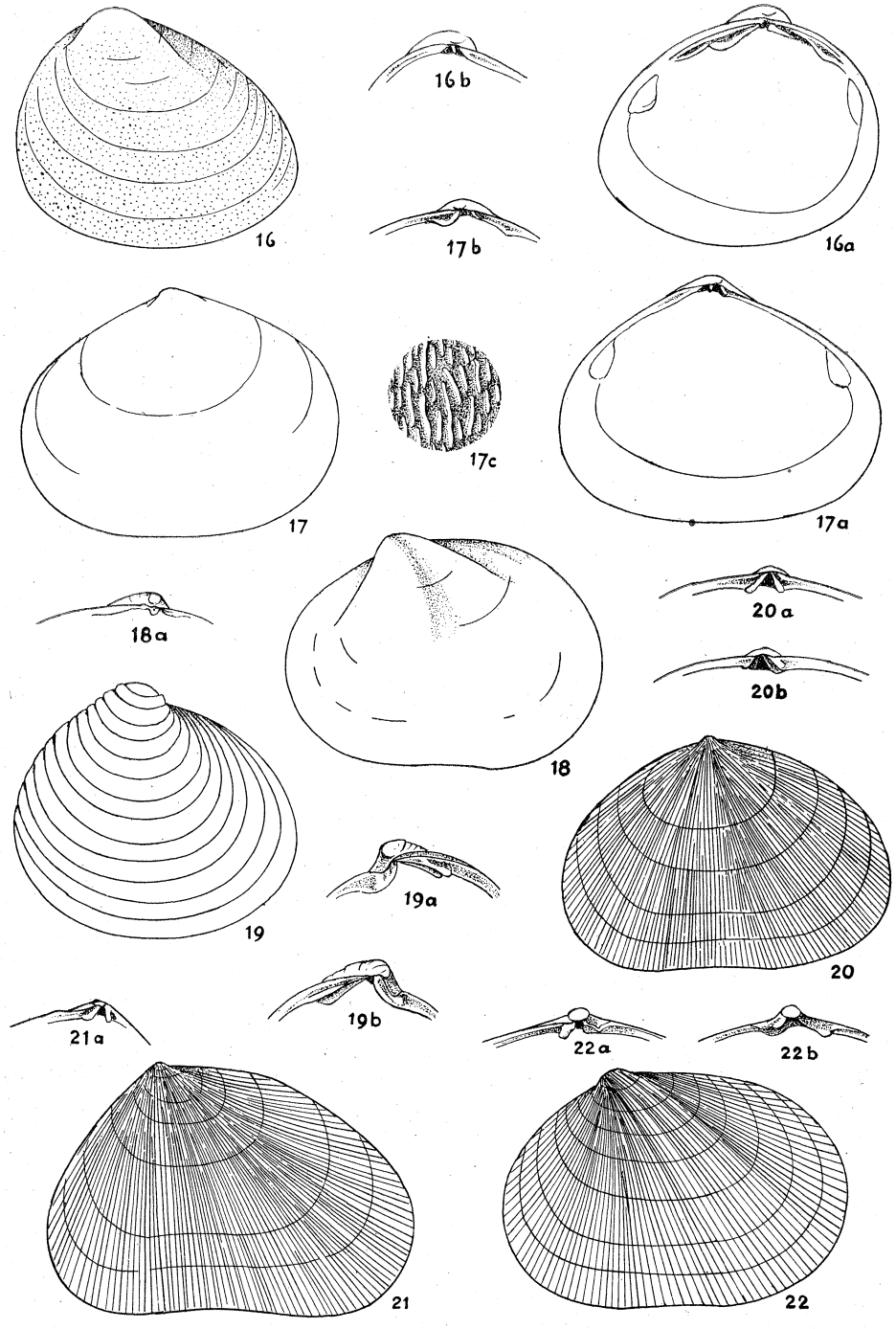
Genus **Mysella** Angas, 1877.

Type species, *Mysella anomala* Angas.

The original description reads: "Shell small, thin, equivalve, inequilateral, quadrately cuncate, concentrically striated. Hinge with a small triangular internal cartilage-pit, close to which is a single small, diverging, subcircular, flattened cardinal tooth in one valve, and with two thin short horizontal lateral processes in the other valve. Siphonal inflection none."

Hedley in his check list (1917) uses *Rochefortia* Velain for this (*M. anomala*) and other species, following Dall, who considered the two congeneric, and that *Rochefortia* had priority. Iredale (1924), however, pointed out that there was no necessity to consider the question of synonymy as *Mysella* has actual priority by several months, and that *Mysella* is a good genus covering a natural group of Australian species. Cotton and Godfrey (1938) have accepted this and used *Mysella* for certain Adelaidean species, and Powell has also used it for others from New Zealand.

Hedley (1917) listed six species under *Rochefortia* but these need considerable revision. *Montacuta angasi* Smith is definitely not a *Mysella* and is dealt with elsewhere in this paper. The typical South Australian species *Mysella donaciformis* Angas evidently does not occur on the New South Wales coast. There are actually two small species, one of which was figured



Figures 16 to 22.

16, *Melliteryx helmsi* Hedley, left valve (16*a*, 16*b*, hinge); 17, *Vermitexta garrardi* Laseron, left valve (17*a*, 17*b*, hinge; 17*c*, surface magnified); 18, *Cicatellia indenta* Laseron, left valve (18*a*, hinge); 19, *Kellia australis* Lamarck, left valve (19*a*, 19*b*, hinge); 20, *Borniola lepida* Hedley, left valve (20*a*, 20*b*, hinge); 21, *Borniola filosa* Hedley, left valve (21*a*, hinge); 22, *Borniola radiata* Hedley (after Hedley), left valve (22*a*, 22*b*, hinge).

by Hedley (1902) as *R. donaciformis*, but neither of which corresponds with the type. The deepwater *Rochefortia lactea* Hedley, conforms to Mysella and is there retained. *Tellimya subacuminata* Smith presents another problem. The type came from the disputed *Challenger* Station, 410 fathoms off Sydney, the figure is of the exterior of one valve only, and the description is very brief, the only information given of the hinge and muscle scars being that they are similar to those of *Montacuta acuminata* Smith, a species from Cape York. Reference to the description of that species, however, shows it to have a pallial sinus, and assuming the comparison to be correct, *T. subacuminata* does not even belong to the Leptonidae. It should probably be expunged from the New South Wales list altogether, but that point does not arise here, as it comes in any case outside the scope of this paper.

A feature not mentioned by Angas in his description, but common to all the species here discussed, is that the horizontal lateral processes in the right valve are caused by a peculiar infolding of the dorsal margin on either side of the umbos, and are in no sense lateral teeth as generally understood. It may be added also that the anterior end is longer than the posterior.

Mysella anomala Angas.

(Figs. 23, 23*a*, 23*b*)

Angas, 1877, Proc. Zool. Soc. Lond., 176, pl. 26, fig. 22.

The type came from black mud, 12 fathoms off Shark Island, Port Jackson, and the specimen illustrated is one from a number dredged in the near vicinity. Its length is 8.6 mm; height 6 mm; and depth of the united valves 3.5 mm. Compared with other species of *Mysella* the rather tumid umbos are useful for recognition. Specimens from the type area are fairly constant, but odd specimens from other localities show a slight variation. One from 30 to 35 fathoms off Crookhaven has the umbonal area still more tumid, but agrees in other characters and is apparently the same species.

Mysella vitrea sp. nov.

(Figs. 24, 24*a*, 24*b*)

Shell small, thin, white, shining, vitreous and translucent. Equivalve, form sub-oval, posterior side longer, umbos fairly prominent, pointing forwards, about one-third from the anterior end. Anterior, posterior and ventral margins rounded, dorsal margin sloping and nearly straight posteriorly, anteriorly slightly concave. Surface shining, the only sculpture fine concentric lines, adductor scars visible externally. Hinge with a triangular subumbonal resilifer in each valve, the left valve with a very strong, flattened, oblique cardinal tooth behind the resilifer fitting into a socket on the side of the resilifer in the right valve. Right valve with no teeth, but the dorsal margin infolded on both sides of the umbo, its edge thickened to simulate lateral teeth. Adductor muscle scars subequal, large but faint. Length 3.6 mm; height 2.8 mm; depth of single valve approximately .7 mm.

Localities.—Dredged, North Harbour, Port Jackson (type); also in Pittwater (north of Sydney); abundant in shell sand, Port Stephens, Jervis Bay and on ocean beaches.

Remarks.—This is apparently the species previously identified as the South Australian *Mysella donaciformis* Angas, and figured as such by Hedley (1902, pl. I, fig. 10-14). It is, however, not nearly so inequilateral, the true *M. donaciformis* having the umbos nearly terminal. It is somewhat variable in its proportions, the length being from one-fifth to one-fourth more than the height. Specimens from Port Stephens are slightly larger, being up to 5 mm in length, and proportionately are rather higher than the type.

Mysella lactea Hedley.

(Figs. 25, 25*a*, 25*b*, after Hedley)

Hedley, 1902. Aust. Mus. Mem., iv, 320, fig. 59.

The type locality is 63 to 75 fathoms off Port Kembla, and the dimensions given by Hedley are length 3 mm; height 1.9 mm. A small white, thin translucent shell, this is more inequilateral than any of the other species. I have not seen specimens, but Hedley's good description and figure should make it easy to recognize.

Mysella spernax (Iredale).
(Figs. 26, 26*a*, 26*b*)

Virmysella spernax Iredale, 1930. Rec. Aust. Mus. xvii, 394, pl. lxiv, figs. 10-12.

Iredale proposed both a new genus and species for a very common shell found on the outer beaches, and also in dredgings from sandy bottoms within Port Jackson. He remarks that it has frequently been confused with *M. anomala* which it in no sense resembles. In this he is quite correct, but a closer comparison could have been made with *Lepton concentrica* Gould which is included in Hedley's check list as *Rochefortia*, No. 199. The type of *L. concentrica* is in the National Museum, Washington, and Hedley (1914) published a drawing of the single valve forming the type supplied by Dr. P. Bartsch. He (Hedley) remarked that the species was possibly "exotic". The drawing, which does not show the hinge, resembles the species here discussed, but differs slightly in shape, and may refer to a different species. In view of this *L. concentrica* can be queried on the New South Wales list.

I do not agree, however, with the separation of *Virmysella* from *Mysella* generically.

The shell figured in Iredale's paper is the harbour (Port Jackson) *M. anomala* with which it has been confused. A note by Brazier states: "Off Shark Island, Port Jackson, 12 fathoms bottom black mud. Specimen sent to Angas Sept. 4, 1874." This is the type locality and the shell is obviously a paratype of Angas's species. The drawing differs from the type and the description of *Mysella spernax*, although the hinge of the latter type is adequately shown. The shell characters and particularly the hinge are characteristically those of *Mysella*. There is the same prominent plate-like cardinal tooth in one valve, fitting into a niche-like recess in the side of the resilifer of the opposite valve, the same infolding of the dorsal margin of this valve with the simulation of lateral teeth, and the adductor muscle scars and the pallial line also agree. *Virmysella* is in my opinion a synonym of *Mysella*.

The specimen illustrated came from 6 to 9 fathoms, Sow and Pigs Reef, Sydney Harbour, from a sandy bottom. Its length is 13 mm; height 10.5 mm; and depth of one valve approximately 2.5 mm. A larger specimen had a length of 17 mm which is about the maximum. It is a slightly variable species, and some specimens are relatively a little longer in proportion to their height.

Mysella cretacea sp. nov.
(Figs. 27, 27*a*, 27*b*)

Shell small, moderately stout, opaque, white, covered with a thin, yellowish grey periostracum. Form suboval, narrowed posteriorly, inequilateral, the posterior end the longest, umbos small, pointing forwards, about one-fourth from the anterior end. Posterior and ventral margins rounded, anterior margin slightly rounded, dorsal margin sloping posteriorly, slightly concave anteriorly. Sculpture fine concentric growth lines. Hinge as in *M. vitrea*, but the cardinal tooth in the left valve relatively not as large, the dorsal margin in the right valve similarly infolded to simulate two lateral teeth. Adductor muscle scars prominent, the simple pallial line thick. Length 7 mm; height 5.5 mm; depth of united valves approximately 2.4 mm.

Locality.—Very common on muddy bottom in 10 feet, Crookhaven, south of Sydney.

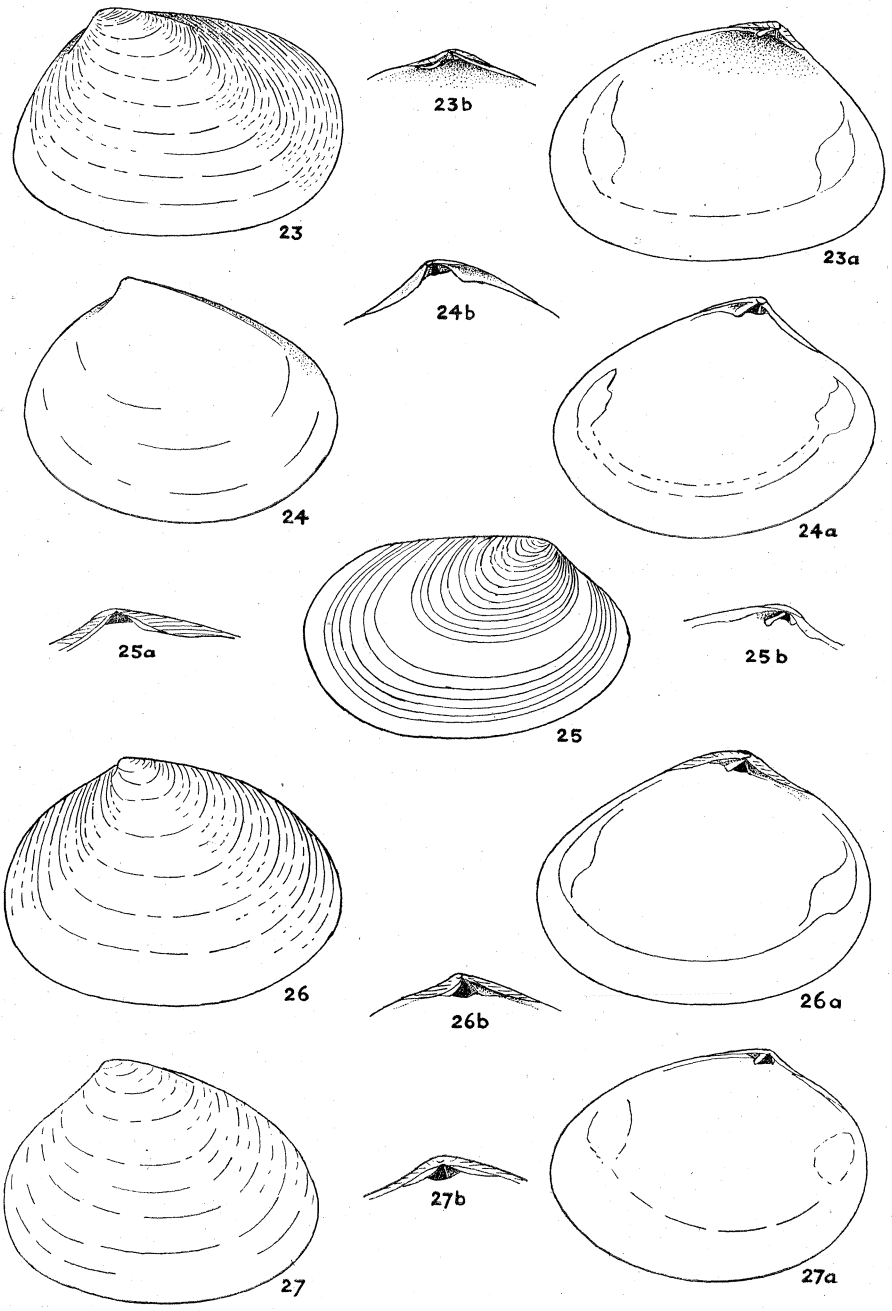
Remarks.—Very close in general form to *M. vitrea*, but readily separated by its stouter shell and texture, which is opaque and rather chalky, not vitreous and translucent. The habitat is estuarine, for Crookhaven is liable to heavy flooding, and few true marine mollusca can retain their footing. *M. vitrea* and *M. cretacea* are I think closely allied species, the one adapted to marine conditions on a sandy bottom, the other estuarine and living in mud.

DOUBTFUL SPECIES.

Montacuta angasi Smith.

Montacuta angasi. Smith, 1885. Chall. Zool. xiii., 204, pl. 12, fig. 2.

The type in the British Museum is a single right valve dredged from 2-10 fathoms in Port Jackson, the dimensions given being length 5.5 mm; height 4 mm; depth 2.5 mm. The species has never been definitely recognized since its original description, which in view of the intensive collecting done in Port Jackson is rather remarkable. Two specimens in the Australian Museum, C.6486, provisionally identified as Smith's species and sent to the British Museum for comparison in 1912, are marked as not *angasi*. They resemble the species here called *Fronsella adipata* of which they may be the young. Judging by the original figure *M. angasi* is a species in form somewhat like *Parvikellia* as described here, almost perfectly oval in outline, with small erect umbos, nearly centrally placed. The hinge, however, is quite different with two laterals and no cardinal teeth. Its identity and also its generic position must, therefore, be left for the present in abeyance.



Figures 23 to 27.

23, *Mysella anomala* Angas, left valve (23*a*, 23*b*, hinge) ; 24, *Mysella vitrea* Laseron, left valve (24*a*, 24*b*, hinge) ; 25, *Mysella lactea* Hedley (after Hedley), right valve (25*a*, 25*b*, hinge) ; 26, *Mysella spernax* Iredale, left valve (26*a*, 26*b*, hinge) ; 27, *Mysella cretacea*, Laseron, left valve (27*a* 27*b*, hinge).

Montacuta semiradiata Tate.

Montacuta semiradiata Tate, 1889. Trans. Roy. Soc. S.A., xi, 63, pl. 40, fig. 2.

This species was recorded by Hedley as *Coriareus semiradiatus* from 80 fathoms off Narrabeen, north of Sydney. It is felt, however, that the identification of this with a South Australian species is doubtful, and that when material comes to hand again a new species may be indicated. In the meantime *M. semiradiata* may be considered a doubtful member of the New South Wales fauna.

SUMMARY.

The revision covers all genera, with the exception of *Notolepton* Finlay, of a group of very small New South Wales bivalves. Family classification of the group (Leptonidae) is followed rather than that of superfamily (Leptonacea). Twelve genera and twenty-nine species from New South Wales are discussed. Five gen. nov. and twelve sp. nov. are as follows: *Marikellia tumida* sp. nov., *Fronsella adipata* gen. and sp. nov., *Fronsella reversa* gen. and sp. nov., *Parvikellia isolata* gen. and sp. nov., *Parvikellia depressa* gen. and sp. nov., *Pileatona compressa* gen. and sp. nov., *Coriareus jervisensis* sp. nov., *Mylitta calva* sp. nov., *Vermitexta garrardi* gen. and sp. nov., *Cicatellia identa* gen. and sp. nov., *Mysella vitrea* sp. nov., *Mysella cretacea* sp. nov. Genus *Virmysella* as a synonym of *Mysella* is suggested (syn. nov.); and the probability of the South Australian *Lepton trigonale* being more suitably placed in the Genus *Pileatona* gen. nov.

References.

Cotton, B. C., and Godfrey, F. K., 1938.—Mollusca of South Australia. Part I. The Pelecypoda. Government Printer, Adelaide.

Hedley, C., 1902.—Studies on Australian Mollusca. Part VI. *Proc. Linn. Soc., N.S.W.*, xxvi (I); 709.

————, 1905.—Studies on Australian Mollusca. Part IX. *Proc. Linn. Soc., N.S.W.* xxix (4); 520-546.

————, 1907.—Mollusca from Eighty Fathoms off Narrabeen. *Rec. Aust. Mus.* vi (4); 283-304.

————, 1914.—Studies on Australian Mollusca. Part XII *Proc. Linn. Soc., N.S.W.* xxix (4): 697-755.

————, 1917.—A Check-List of the Marine Fauna of New South Wales. Part I.—Mollusca. *Roy. Soc., N.S.W.*, li. Supplement issued, 1918, 1-120.

Iredale, T., 1924.—Results from Roy Bell's Molluscan Collection. *Proc. Linn. Soc., N.S.W.* xlix: 179-278.

————, 1936.—Australian Molluscan Notes, No. 3. *Rec. Aust. Mus.* xix (5); 274.

Laseron. C. F., 1953.—The Minute Bivalves of New South Wales. *Rec. Aust. Mus.* xxiii: 33.

Sydney: A. H. Pettifer, Government Printer—1956.